

# **Content Server Enterprise Edition**

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Version: 5.5.1

## **Developer's Guide**

Document Revision Date: May 5, 2004



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*CSEE Developer's Guide*

Document Revision Date: May 5, 2004

Product Version: 5.5.1

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## Section 1

# Overview

This section provides an overview of the Content Server Enterprise Edition (CSEE) products, and the development process. It contains the following chapters:

- Chapter 1, “Overview of Content Server Enterprise Edition”
- Chapter 2, “CSEE Development Process”





## Chapter 1

# Overview of Content Server Enterprise Edition

The Content Server Enterprise Edition (CSEE) product family is a high-performance, large-scale content management and delivery system. You and your development team use CSEE to create and manage large, complex web sites or other online sites (WAP, for example), including those that run online businesses.

The CSEE product family is described in the following sections:

- Content Server Enterprise Edition (CSEE)
- Content Server
- CS-Satellite
- CS-Direct
- CS-Direct Advantage
- Commerce Connector
- CS-Engage
- Analysis Connector

## Content Server Enterprise Edition (CSEE)

Content Server Enterprise Edition (CSEE) is a modular set of content-driven applications for e-business projects like enterprise portals, department sites, customer/partner web sites, and commerce implementations.

### CSEE Products

CSEE includes the following products:

- **Content Server**, the core application that all the content applications are built upon. It is the operating system that powers the entire CSEE product family, stores the content that you are managing, and serves that content to your site visitors.

Typically, you use one of the content applications (described below) as the data input mechanism for entering the content that you want to manage into the Content Server Enterprise Edition database. However, you can develop your own content application with the Content Server Enterprise Edition APIs if you have special needs that the CSEE content applications do not meet.

- **Content Server Satellite (CS-Satellite)**, a caching application that provides automatic double-buffered caching on your CSEE system, ensuring that outdated content is never displayed on your live web site.

You can also use CS-Satellite to speed the performance of your delivery system by serving cached images and Content Server Enterprise Edition pages from remote servers. You use CS-Satellite to reduce the load on the Content Server delivery system and to deliver pages even more quickly.

- **Content Server Direct (CS-Direct)**, the base content application built with the Content Server Enterprise Edition Java APIs. It provides an interface that takes advantage of all of Content Server's features, adding another layer that extends the Content Server content management features.

CS-Direct creates a structure for your content in which that content is stored as objects called **assets** in the Content Server Enterprise Edition database. CS-Direct introduces the **basic asset model** in which there is one primary storage table in the database for each type of asset.

- **Content Server Direct Advantage (CS-Direct Advantage)**, the content application that extends the basic asset model. CS-Direct Advantage introduces the **flex asset model** in which child assets inherit attribute values from their parents and each asset type has several storage tables. It also provides commerce features such as the shopping cart construct.

Whether you chose the basic asset model or the flex asset model depends on the complexity of the data you plan to serve to your visitors. The flex asset model has historically been used for creating large online catalogs of products. However, depending on your data structure, you might use the flex model even if you are not building an online business.

- **Commerce Connector**, a plug-in that enables CS-Direct Advantage to communicate with Transact. (Transact is back-office software that processes payment cards, tracks order flow, registers buyers, and performs many other complicated e-commerce tasks.)

- **Content Server Engage (CS-Engage)**, an application that enables your marketing team to divide your site visitors into segments and then target those segments with personalized promotional, marketing, or informational messages.
- **Analysis Connector**, an application that captures web site events such as visitor activity and clickstream data. This product streams the data you decide to collect to files. You configure its background process to import that data into the Content Server Enterprise Edition database during off-peak hours and then you can use that information in your CS-Engage segments.
- **CS-Bridge XML**, an exchange engine that receives documents from outside sources, automatically applies the business logic that is appropriate to the document and partner, and sends content or other business documents to the partner systems.

## Additional Components

The products in the CSEE product family are themselves layered on top of a DBMS, a web server, and an application server:

- Web servers respond to requests for content by serving HTML pages.
- The DBMS stores information about your web site's content.
- Application servers are the interface between a web server and a DBMS. Application servers provide fault-tolerance, clustering, and a failover mechanism. The Content Server product makes extensive use of the underlying application server.

The code that you write for your online sites does not depend on the type of web server, application server, or DBMS on your content management system. With only a few exceptions, the code that you write for one configuration will continue to work if you move to a new configuration.

## J2EE Standard

Java 2 Platform, Enterprise Edition (J2EE) is an industry standard for developing multi-tier enterprise applications. J2EE is a framework for simplifying enterprise applications by basing them on standardized, modular components, by providing a complete set of services to those components, and by handling many details of application behavior automatically, without complex programming.

All of the applications in the CSEE product family conform 100% to the J2EE standard.

## CSEE Systems

When you are using CSEE as your content management system, you and the others on your team work with up to four different systems:

- **Development** system, where developers and designers plan and create the online site.  
All of the products that you have purchased are installed on this system (including Commerce Connector or Analysis Connector, if you are using them).
- **Management** system, where content providers such as writers, editors, reviewers, graphic artists, product managers, and marketers develop the content that is delivered from the online site. Revision tracking and workflow tracks changes to the assets (the content), monitoring them until they are approved to be published to the delivery system.

Only Content Server and the content applications such as CS-Direct, CS-Direct Advantage, CS-Engage are installed on this system. Because this system does not deliver the online site to your visitors, there is no need for Commerce Connector or Analysis Connector to be installed on it.

- **Delivery** system, where the content you are making available or the products that you are selling are served to your visitors or customers.

If you are delivering your content dynamically, all of the CSEE products that you purchased are installed on this system. If you are delivering your content statically — that is, if you are serving static HTML pages— your delivery system is a web server only and you do not have any of your CSEE products installed on that system.

- **Testing** system, where you or your QA engineers test the performance of both the management system and the delivery system.

As a developer, you spend the majority of your time working on the development system. When the asset types that you develop and the site that you have designed are ready, you migrate your work from the development system to the management system. As assets are created, modified, and approved by the content providers on the management system, they are published from the management system to the delivery system.

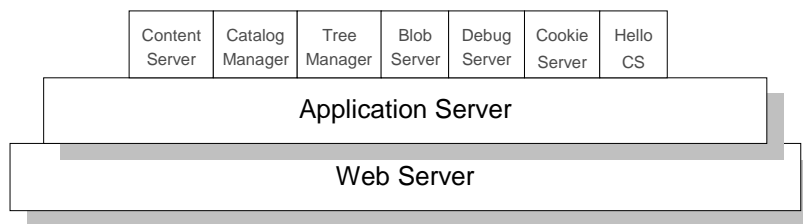
## Content Server

Content Server is the operating system that powers the entire CSEE product family. Although the content applications such as CS-Direct and CS-Direct Advantage make it easier for you to design the data structure of the data that you want to serve from your online site and to design and assemble your online site, it is the Content Server Enterprise Edition application that actually serves that data.

In addition to being an operating system that runs the product family and serves your content, Content Server is a toolset. It provides Java methods and utilities that you can use for both designing your public online site and for developing your own content application (or for customizing one of the CSEE content applications).

## Servlets and Java APIs

The Content Server operating system consists of several servlets that run on top of an application server, each of which is invoked when necessary to perform a discrete set of tasks. Each servlet has a corresponding Java API with Java methods and custom XML and JSP tags that you use to invoke the functions that you need to use. Servlets are shown in the following figure:



The Content Server servlets are as follows:

- **ContentServer** – Generates and serves pages dynamically. This servlet provides disk caching, session management, event management, searching, and personalization services.

### Note

The ContentServer servlet (one word) is distinct from Content Server (two words), which refers to the application.

- **CatalogManager** – Provides most of the database management for the Content Server database, including revision tracking, security, resultset caching, and publishing services.
- **TreeManager** – Manages the tree tables, which store hierarchical information about other tables in the Content Server database.
- **BlobServer** – Locates and serves binary large objects (blobs). Blobs are not processed in any way—they are served as is, as they are stored.
- **CookieServer** – Serves cookies for Content Server pages, whether those pages are delivered by the ContentServer servlet or by the CS-Satellite application.
- **DebugServer** – Provides tools that help you debug your XML code.

- **HelloCS** – Displays version information about the Content Server software installed on your system.

In general, you do not need to know which servlet performs which service or task. You simply invoke the appropriate Java method or XML or JSP tag and let Content Server determine which servlet to call.

The exception to this rule is when you write code that references a servlet URL; that is, when you include a link to a blob or to another page on a Content Server page. The `ContentServer` servlet and the `BlobServer` servlet reside at different URLs and you must include the URL of the appropriate servlet in your `<A HREF>` tags.

For information about the coding links to blobs and pages, see Chapter 3, “Programming with CSEE” and Chapter 21, “Coding Elements for Templates and CSElements.”

## Page Generation

In very simplistic terms, the main purpose for Content Server is that it separates format from content. By separating the two, you can reuse the same bits of formatting code for many pieces of content. If you want to change the format of your articles, for example, you make the change in one place rather than having to rewrite code for every article in your system.

With Content Server, your format is stored in files called **elements**. Element files contain code (Java, XML, JSP, HTML, JavaScript, and so on) that extract the content from the database and format it. The content is formatted by the elements only when a page is requested, which means that you have the opportunity to design pages that are constructed based on the identity of the visitor requesting them.

A page in the Content Server environment is the result of an HTTP request displayed in a browser. Content Server creates a page by compiling several parts of pages, called **pagelets**, into one final, displayed or rendered page. The page is the output (HTML, XML, WAP, and so on) that Content Server generates when it parses your JSP or XML elements and blobs.

## Rendering Pages: the SiteCatalog and ElementCatalog Tables

Element files are stored in the `ElementCatalog` table in the Content Server database. The names of your pages and parts of pages (pagelets) are stored in the `SiteCatalog` table. That is, the `SiteCatalog` table stores the entries for all the legal page names for your online site.

Each row in the `SiteCatalog` table is a page entry. Each page entry points to an element in the `ElementCatalog` table. That element (the one that a page entry points to) is called the **root element** of the page entry.

Content Server renders your content into an online page by executing `SiteCatalog` page entries. Here's how it works:

1. A visitor enters a URL to your online site in a browser.
2. The web server that processes the HTTP request maps that URL to a Content Server URL. For example, this is a Content Server URL:

```
http://www.BurlingtonFinancial.com/servlet/  
ContentServer?pagename=BurlingtonFinancial/Home
```

The text at the end of a Content Server URL is called the `pagename`. In this example, the `pagename` is `BurlingtonFinancial/Home`.

3. Content Server looks up the page name in the `SiteCatalog` table, determines its root element, locates that element in the `ElementCatalog` table, and then invokes that element.
4. The element is executed. If there are calls to other elements from within the root element, those elements are executed in turn.
5. The results—images, articles, and so on, including any HTML tags—are rendered into HTML code and returned to the visitor's browser.

The result is a page that is dynamically rendered on demand.

## Static HTML Page vs. a CSEE Page

A dynamic CSEE page differs from a typical HTML page, as shown in the following table:

HTML Page	CSEE Page
Single disk file served via a web server. Because an HTML page is not dynamic, each request can only display one page.	Generated upon request. Content Server makes dynamic content decisions based on the request. Different requests for the same page may generate different pages.
One-to-one association between an HTML page and the page the visitor sees in the web browser.	The web page that the visitor sees can be composed of multiple Content Server pagelets.
No separation of format and content. As a result, it is difficult to modify either form or content independently.	Form and content are separated so that each can be modified and maintained independently of the other.

## Modular Page Design and Page Caching

Because CSEE separates format from content, it encourages you to design pages that are created by assembling pagelets such as headers, footers, sidebars, advertisements into a final page. That way those pagelets can be reused for multiple pages but maintained in only one place.

For best performance, you need to consider your page caching strategy when designing your site pages. If an element hasn't changed and it will generate the same page each time it is invoked, why make Content Server process the element each time it is called? If the generated page is cached, it can be served much faster than it can if it must first be generated.

Content Server can separately cache each page or pagelet that is identified by a page entry in the `SiteCatalog` table. You can mark the expiration date of any pagelet in the cache by specifying those values for that page entry in that table.

When you are using the CS-Satellite application (and you should), the Content Server page cache is extended and supplemented with the page caches on each server hosting a CS-Satellite.

- For more information about page caching, see Chapter 4, "Page Design and Caching."

- For information about CS-Satellite, see “CS-Satellite” on page 34.

## Content Server Database

Nearly everything in Content Server (and the CSEE content applications) is represented as a row in a database table. For example: pagenames are stored as rows in the `SiteCatalog` table and elements are stored as rows in the `ElementCatalog` table.

There are five types of tables in the Content Server database: object, content, tree, foreign, and system. They are described in Chapter 10, “The Content Server Database.”

Content Server makes extensive use of the underlying database management system, and manages many tables. It keeps track of all the tables on a system by keeping a record of them in the Content Server `SystemInfo` table, which is a table of tables.

### Note

In older versions of Content Server, database tables were called catalogs, and as a result, some tables still have the word “catalog” as part of their names.

## Resultset Caching

Resultset caching is another area that can greatly enhance your system performance. When the Content Server database is queried by any mechanism, Content Server can cache the resultset that it returns. Content Server keeps track of every table in the database and whenever a table is modified, it flushes all the resultsets that were cached for that table.

You configure resultset caching through properties in the `futuretense.ini` file.

For more information about resultset caching, see Chapter 12, “Resultset Caching and Queries.”

## Sessions and Cookies

Content Server automatically creates a session when a visitor first visits your online site. You can use the Content Server tags and methods to store information about that visitor in session variables and then subsequent elements can access those variables and respond conditionally to them.

A session lasts until one of the following events occurs:

- The visitor closes his or her browser.
- The session times out after a period of inactivity. You control session timeouts through a property in the `futuretense.ini` file.
- The application server is restarted (except in a cluster).
- You disable the session in some other way.

Session variables last only as long as the session lasts. To store information on a more permanent basis, use cookies.

You can code your elements to write cookies that store information about your visitors to their browsers. Then you can use that information to customize pages and display the appropriate version of a page to the appropriate visitor when they return to your online site.



For more information about sessions and cookies, see Chapter 6, “Sessions and Cookies.”

## Security and User Management

CSEE security features allow you to limit access to:

- Individual database tables
- Individual CSEE pages

In other words, not only can you control which of the users of your content management system can add or change data in the Content Server database, you can control which visitors are allowed to see which pages in your online site.

- For information about user management on the management system, see the *CSEE Administrator's Guide*.
- For information about user management on the delivery system, see Chapter 23, “User Management on the Delivery System.”

## Content Server Enterprise Edition and Publishing

You make content available to the visitors of your online site by moving it from your management system to your delivery system. This process is called **publishing**.

CSEE provides two publishing APIs: Export and Mirror. The Export API renders your CSEE pages into static HTML files. The Mirror API copies rows from tables in the Content Server database on your management system to the corresponding tables in the Content Server database on your delivery system.

CS-Direct delivers publishing functionality that is built with these APIs. The CS-Direct publishing options are called Export to Disk and Mirror to Server.

- For information about the publishing APIs, see the *CSEE Java API Reference* and the *CSEE Developer's Tag Reference*.
- For information about the publishing features delivered with the CSEE products, see the publishing chapter in the *CSEE Administrator's Guide*.

## Search Engines

Content Server does not provide a search engine but it does provide interfaces to the following search engines:

- AltaVista
- Verity

For information about using a search engine on either your management system or your delivery system, see the *CSEE Administrator's Guide*.

## Content Server Events

Many users are familiar with `cron`, a daemon that runs certain programs at a specified time and place. Content Server provides a similar feature called event management. This feature enables you identify elements that should be run at a certain date and time. For example, you might schedule a Content Server event to delete voided assets from your database.

## Revision Tracking

Content Server provides revision tracking functionality that prevents a row in a table from being edited by more than one user at a time. When you enable revision tracking for a table, Content Server maintains multiple versions of a row in a table.

## CS-Satellite

Your installation of CSEE includes CS-Satellite, a program that caches the pages and pagelets that you create. By default, CS-Satellite is installed on the same box where Content Server is installed. This co-resident CS-Satellite works in combination with Content Server to provide double-buffered page caching.

You can also improve your system's performance by using remote installations of CS-Satellite to cache pages and pagelets closer to their intended audience. Remote CS-Satellite hosts are fast, inexpensive caches of Content Server pages. They reduce the load on the Content Server host, dramatically increase the speed of page delivery to your site visitors, and provide a simple and inexpensive way to scale your CSEE system.

In order to use CS-Satellite to cache your pages and pagelets, you include CS-Satellite XML or JSP tags in your page elements. These tags tell CS-Satellite which parts of which pages should be held in its cache.

After you have coded your web site with Satellite tags, you then call your pages with Satellite URLs.

## Handling the HTTP Requests

When the load balancer routes an HTTP request for a page to CS-Satellite, the following chain of events occurs:

1. CS-Satellite checks its cache.
2. If the page is in the cache, CS-Satellite serves it to the visitor's browser.
3. If the page is not in the CS-Satellite cache, it routes the request to Content Server.
4. If Content Server has the page in its cache, it returns the cached page to CS-Satellite. If the page is not in the Content Server cache, Content Server renders the page, caches a copy, and sends the page to CS-Satellite.
5. CS-Satellite caches the page and serves it to the visitor's browser.

Each CS-Satellite application is independent of every other CS-Satellite application. An individual CS-Satellite application has the following characteristics:

- It maintains its own cache.
- It cannot mirror its cache to a cache on another server maintained by CS-Satellite.
- It cannot request pages or pagelets from another CS-Satellite application. It can only request pages or pagelets from Content Server.

## CS-Satellite Servlets and APIs

CS-Satellite is made up of the several servlets: one that caches and serves pages and two that manage the cache:

- **Satellite** – Caches pages at the pagelet level. The Satellite XML or JSP tags in your elements indicate which pagelets should be cached, and they control various CS-Satellite settings.
- **Inventory** – Enables you to examine the CS-Satellite cache so you can obtain the information you need to manually flush individual pages or pagelets from the cache when necessary.
- **FlushServer** – Handles all types of cache-flushing. FlushServer can either flush the entire cache, or can flush individual items from the cache.

For information about coding pages with the CS-Satellite tags and page caching in general, see Chapter 4, “Page Design and Caching.”

## CS-Direct

CS-Direct is the base content application built with the Content Server Java APIs. It provides an interface to the Content Server database that enables you to easily organize, categorize, manipulate, and maintain your content objects. These content objects are called **assets**.

The CS-Direct application takes advantage of all of Content Server's features, adding another layer that extends the content management features. CS-Direct introduces the following concepts and features to the CSEE product family:

- The basic asset model
- The CSEE site and the site plan
- The Burlington Financial sample site
- The Hello Asset World sample site
- Extension of the Content Server rendering model through template, CSElement, and SiteEntry assets
- Custom XML and JSP tags
- Enhanced publishing functionality: the approval subsystem
- Enhanced revision tracking functionality
- Workflow
- CS-Desktop and the InSite Editor
- Additional search engine features

You use CS-Direct to design the data that you want to store in the Content Server database, to create and manage the content in the system, and to design the online site that you present on your delivery system.

Because nearly everything in Content Server and the CSEE content applications is represented as a row in a database table, all of the CS-Direct features and functions are reflected in the Content Server database.

## Basic Asset Model

CS-Direct creates a structure for your content in which that content is stored as objects called **assets** in the Content Server database. CS-Direct introduces the **basic asset model** in which there is one primary storage table in the database for each type of asset.

Assets are the core of CS-Direct. **Asset types** represent content types. For example, you might have asset types such as articles and images.

Assets are objects that can be created, edited, inspected, deleted, duplicated, placed into workflow, tracked through revision tracking, searched for, previewed, and published, all of which are functions in the CS-Direct application.

During the process of designing your online site, you and the others on your team examine your design and determine which parts should be assets. Data should be treated as an asset and not embedded into your code.

Additionally, asset types can represent types of logic. For example, the core asset types that facilitate the site design features of CS-Direct are the page asset, collection, query asset, template asset, CSElement, and SiteEntry. All of these asset types are logic, or site design asset types. In another example, the Burlington Financial sample site delivered with CS-Direct has an asset type called stylesheet.

These logical functions use the asset data model so that you can use the CS-Direct content management features of workflow, revision tracking, access control, and so on to maintain them.

For more information about basic assets and asset types, see:

- Chapter 9, “Data Design: The Asset Models”
- Chapter 14, “Designing Basic Asset Types”

## Sites and the Site Plan

CS-Direct introduces the concept of a “site” to the CSEE product family. A site is an object that you use as an organizational construct for an actual online site and as an access control tool. You use sites to manage or control access to assets as well as a design aid for designing your online site.

When you log in to any of the CSEE content applications, you are logging in to a CSEE site. If you have access to more than one site, the first decision that you make after logging in is which site you want to work on.

A CSEE site represents a real, online site. However, it can represent that online site in any number of ways, depending on what makes sense for your situation. For example, you could create separate CSEE sites for separate sections of your online site because the teams who provide content for each section work completely separately from each other and only members of that team should have access to that section (CSEE site). Or, you could create a CSEE site that represents an entire online site, as does the Burlington Financial sample site.

When you install CS-Direct, the **Site Plan** tab and the rest of the tree appear in the Content Server interface. The **Site Plan** tab displays a representation of the site design for the CSEE site that you are currently logged in to.

For information about CSEE sites and the **Site Plan** tab, see Chapter 9, “The CSEE Site.”

## The Burlington Financial Sample Site

CS-Direct provides a fully functional sample site named Burlington Financial. Most of the examples in this guide that illustrate CS-Direct functionality or coding practices are taken from this sample site so that you can examine them both in this book and online in the context of an actual online site.

Burlington Financial provides sample asset types, elements, SiteCatalog entries, a workflow process, and so on.

For information about the Burlington Financial sample site, see Chapter 27, “The Burlington Financial Sample Site.”

## The HelloAssetWorld Sample Site

In addition to the Burlington Financial sample site, there is an additional sample site called HelloAssetWorld. It is designed to provide a simple introduction to creating a CSEE web site.

The templates that compose HelloAssetWorld are described in Chapter 25, “The HelloAssetWorld Sample Site.” Further information on HelloAssetWorld’s configuration and users is available in the *CSEE Administrator’s Guide* and the *CSEE User’s Guide*.

## Template, CSElement, and SiteEntry Assets

When you are using CS-Direct, there is an additional layer in the Content Server page rendering process: the template, CSElement, and SiteEntry asset types.

CSElement, template, and SiteEntry asset types provide the pagelets and elements that build your online sites. They are asset representations of elements and page names, the components that Content Server uses to generate pages. Because they are assets, elements and page names can be managed with workflow and revision tracking.

For information about template, CSElement, and SiteEntry assets, see Chapter 19, “Creating Template, CSElement, and SiteEntry Assets.”

## Custom CS-Direct XML and JSP Tags

CS-Direct delivers several new tag families (both XML and JSP versions) that you use to code your elements. You use these tag families to identify, extract, and then display assets on your online site.

- For information about coding pages that display assets that use the basic data model, Chapter 21, “Coding Elements for Templates and CSElements.”
- For information about all of the CS-Direct custom tags, see the *CSEE Tag Reference*.

## Approval and Publishing

As mentioned previously, a Content Server page is the composition of several components into a viewable, final output. Creating that output is called **rendering**. Making either that output or the content that is to be rendered available to the visitors of your online site is called **publishing**.

You publish by moving your content from your management system to the delivery system. CS-Direct delivers two publishing methods built with the Content Server

publishing APIs. These publishing methods interact with the CS-Direct approval system, an underlying system that determines which assets have been approved.

When assets are ready to be published, someone marks them as approved. Then, when the publish process is ready to start, it invokes the approval system which compiles a list of all the approved assets and examines all the dependencies for those assets. If an asset is approved but an asset that it is linked to is not approved, that asset is not published until the linked asset is also approved.

The CS-Direct publishing and approval systems track and verify all the asset dependencies, which maintains the integrity of the content on your delivery system. These systems ensure that only the assets that you have determined are ready to be published get published.

The CS-Direct publishing methods are as follows:

- **Mirror to Server** is the dynamic publishing method. It is built with the Content Server Mirror API and copies approved assets from the Content Server database on one system to the Content Server database on another system.
- **Export to Disk** is the static publishing method. It renders your approved assets into static HTML files, using the template elements assigned to them to format them. An administrator or automated process then copies those files to your delivery system using FTP or another file transfer method.

For information about configuring publishing, see the *CSEE Administrator's Guide*.

For information about coding elements so that they log dependencies appropriately and how CS-Direct calculates approval dependencies, see Chapter 21, "Coding Elements for Templates and CSElements."

For information about how you approve assets, see the *CSEE User's Guide*.

## CS-Direct and Revision Tracking

When you are using CS-Direct, the Content Server revision tracking feature is extended and implemented for asset types in the Content Server interface. There are additional administrative forms and the asset forms are modified to include revision tracking functionality when it is enabled for that asset type.

You specify which asset types you want to track, CS-Direct enables the revision tracking feature for the appropriate tables without your having to do it directly through Content Server, and the content providers then check out and check back in their assets as they work.

For information about revision tracking, see the *CSEE Administrator's Guide*.

## Workflow

CS-Direct introduces the workflow feature to the CSEE product family. Workflow is the movement of content from one person to another in a predictable, systematic way.

For example, perhaps all articles must be seen by both an editor and by someone from your legal department before they can be approved (and then published). You can use the workflow feature to ensure that the article is assigned to the appropriate person at the appropriate point in its life cycle and to restrict who has access to an asset at each stage.

- For information about creating workflow processes, see the *CSEE Administrator's Guide*.

- For information about using the workflow feature to obtain and finish work assignments, see the *CSEE User's Guide*.

## Additional Interfaces for Working with Assets

In addition to the core extensions to the CSEE interface (forms for creating and managing assets), CS-Direct delivers three alternative methods for entering assets into the Content Server database:

- **CS-Desktop** enables your users to use Microsoft Word to create and edit their assets. Content providers who want to use Word rather than the CSEE interface can install this feature on their personal computers. The feature installs a CSEE toolbar that provides CS-Direct functionality in the Word client.
- The **InSite Editor** is for content providers who need to make edits to (and perhaps approve) assets in the context of how they actually look when they are rendered in a browser. The InSite Editor allows content providers to work in a continuous preview mode.

To enable this interface, you and the other developers must code your rendering templates to activate it for the appropriate asset types.

- **Content Server DocLink (CS-DocLink)** provides a drag-and-drop interface for uploading and downloading documents, graphics, or other files that are managed as flex assets by Content Server. This application presents the hierarchical data structure of the flex parents and flex assets in your Content Server database as folders and files in the Windows Explorer application.

For more information about configuring CS-Desktop, InSite Editor, and CS-Doclink for specific users, see the *CSEE Administrator's Guide*.

For information about coding templates that invoke the InSite Editor, see Chapter 29, "Coding for the InSite Editor."

## Searching and Search Engines

CS-Direct comes with a search function that helps users find the assets that they want to work with. The default search mechanism is a SQL-based database search. You can replace the default search method with a Verity or AltaVista search engine.

To do so, you install the search engine (typically as part of the CSEE installation process). When a search engine is present, CS-Direct presents a different form on the Admin tab that you use to determine which asset types should use the search engine's index-based search, and which (if any) asset types should use the default database search.

To enable searches for assets that you want to display in your online site on your delivery system, you use a combination of SQL queries, query assets, and collection assets. In certain cases, you might also want to use a search engine on your delivery system so that you can implement an index-based search feature for online site.

For information about search engines, see the *CSEE Administrator's Guide*.

## CS-Direct Advantage

CS-Direct Advantage is the CSEE content application built on top of CS-Direct. It extends the asset data model and facilitates the development of online businesses. CS-Direct Advantage introduces the following concepts and features:

- Flex asset model
- Assetsets and searchstates
- The shopping cart
- GE Sample Site
- Custom CS-Direct Advantage XML and JSP tags

## Flex Asset Model

The flex asset data model has historically been used for creating large, online catalogs of products. However, even if you are not designing an online catalog, you might prefer to use the flex asset model.

Basic assets and all of their attribute values are stored in one, primary storage table. That means that all basic assets of the same type must have the exact same attributes (properties). Flex asset types have several storage tables and their attribute values are stored in such a way that this data model allows individual instances of a flex asset type to vary widely.

You do not create individual flex asset types as you do basic asset types; instead, you create a flex family of asset types. There are five members in a flex family:

- flex attribute
- flex asset
- flex parent
- flex asset definition
- flex parent definition

The key member of the family is the **flex asset**. The flex asset is the unit of content that you extract from the database and display to the visitors of your online site (delivery system). All of the other members in the family contribute to the flex asset member in some way.

Following are some general characteristics of the flex asset model:

- Flex assets and flex parents are defined by selecting the flex attributes that describe them.
- The attributes that define the flex assets and flex parents are themselves assets. This means that you can use all of the content management features like workflow, access control, and so on with your individual attributes.
- Flex assets inherit attribute values from their parents. The definition asset types combined with the inheritance of attributes enables you to set up group hierarchies and implement some sort of taxonomy with your data.
- If you ever need to add attributes to your asset types in the future (a common occurrence with products), you just create the new attribute and assign it to the



appropriate definitions. In contrast, with the basic asset model, you cannot add more attributes after you have created the asset type.

- By using the definition asset types, you can set up multiple “templates” for the same flex asset type.

This asset model supports assets that have many, many attributes, which means that it can support large sets of data.

For more information about the flex asset model, see:

- Chapter 8, “Data Design: The Asset Models”
- Chapter 14, “Designing Flex Asset Types”

## Assetsets and Searchstates: Searching the Online Site

The flex asset data model delivers a mechanism to use on the pages that extract and display flex assets: the searchstate.

A **searchstate** is a set of search constraints that are applied to a list or set of flex assets, which is an **assetset**. A constraint can be either a filter (restriction) based on the value of an attribute or based on another searchstate (called a nested searchstate).

A searchstate can search either the attribute tables in the database or the attribute indexes created by a search engine. This means that you can mix database (parametric) and rich-text (full-text through an index) searches to compile a single assetset if you are using the flex asset data model.

Another advantage is that when you use searchstates and assetsets, there is no need to write SQL queries. If a new version of the CS-Direct Advantage application introduces a schema change, your searchstate code does not need to change.

For more information about assetsets and searchstates, see Chapter 21, “Coding Elements for Templates and CSElements.”

## Shopping Carts and Commerce Context

CS-Direct Advantage delivers a toolset of XML and JSP tags that you can use to create a shopping cart for an online business. When a visitor starts a session on your online site, CS-Direct Advantage creates a commerce context for that session.

The CS-Direct Advantage shopping cart functions within that commerce context. You use this tag toolset to identify the contents in a cart, to calculate the price of the items in a cart, to track buyer parameters, and so on.

For more information about the shopping cart, see Chapter 24, “Commerce Integration.”

## The GE Sample Site

CS-Direct Advantage provides a fully functional sample site named GE Lighting that illustrates the flex asset data model. The GE Lighting sample site is an online catalog that sells lighting products.

Most of the examples in this guide that illustrate the flex asset model or coding practices for flex assets are taken from this sample site so that you can examine them both in the book and online in the context of the site.

GE Lighting provides two sample flex families (the product family and the content family), elements, SiteCatalog entries, a workflow process, and so on.

For information about the GE Lighting sample site, see the following chapters:

- Chapter 8, “Data Design: The Asset Models”
- Chapter 14, “Designing Flex Asset Types”

## **Custom CS-Direct Advantage XML and JSP tags**

CS-Direct Advantage provides several new tag families (with both XML and JSP versions) you can use to identify, extract, and display flex assets as well as to implement an online business.

- For information about coding pages that display flex assets, see Chapter 21, “Coding Elements for Templates and CSElements.”
- For information about creating and using shopping carts, see Chapter 24, “Commerce Integration.”
- For information about all the custom CS-Direct Advantage tags, see the *CSEE Developer's Tag Reference*.

## **Additional Interfaces for Flex Assets**

In addition to using the CSEE user interface, there are three other ways to load data into the CSEE databases:

- XML Post allows users to update existing data incrementally. For more information about using XML Post with flex assets, see Chapter 17, “Importing Flex Assets.”
- Bulk Loader allows users to load very large amounts of data. For more information about using Bulk Loader, see Chapter 18, “Importing Flex Assets with the BulkLoader Utility.”
- CS-Doc Link allows users to drag-and-drop data from their machines, upload that data to the Content Server database, and turn it into a flex asset. For more information about using CS-Doc Link, see the *CSEE User's Guide*.

## **Commerce Connector**

If you are using CS-Direct Advantage to deliver an e-commerce solution such as an online catalog, and you are also using the Transact e-commerce system, you connect the two products with Commerce Connector.

The Commerce Connector is a set of Java classes that provide access to a remote Transact e-commerce system. It is based on the SecureLink Software Developer's Kit API (SLAPI), and provides CS-Direct Advantage developers with functionality available through the Transact Order Entry API (OEAPI), Buyer Profile API (BPAPI), and Purchase History API (PHAPI).

The Commerce Connector includes enhanced Java classes to provide a high-level interface between CS-Direct Advantage and a remote Transact installation. CS-Direct Advantage developers call the Java interfaces through a set of XML or JSP tags, and thus remain shielded from the underlying details of communicating with Transact.

The Commerce Connector provides Transact functionality for:

- Order processing for one or more sellers
- Processing payment card verification

- Registering new customers
- Authenticating existing customers

The Commerce Connector kit consists of:

- Transact plug-ins, which are typically installed on the Transact front host
- The client-side utility, which is installed on the Content Server host

The client installation includes a collection of Java interfaces and classes that provide CS-Direct Advantage with an interface to a remote Transact system. The corresponding XML and JSP tags are installed as part of CS-Direct Advantage.

For information about Commerce Connector, see Chapter 24, “Commerce Integration.”

## CS-Engage

CS-Engage is built on top of CS-Direct Advantage and works only within the flex asset data model. This CSEE content application enables your marketing team to divide your visitors into segments and then target those segments with personalized promotional, marketing, or informational messages.

CS-Engage adds personalization and merchandising features to the CSEE product family and extends the XML and JSP tags available for programming your online site. It enables you to design online sites that gather information about your site visitors and customers, evaluate that information, and then use that information to personalize the product placements and promotional offerings that are displayed for each visitor.

CS-Engage introduces the following concepts and features:

- Visitor data and segments
- Recommendations
- Promotions
- Persistent, linked visitor sessions
- Custom CS-Engage XML and JSP tags

## Visitor Data and Segments

Visitor data defines the kinds of information that you want to gather about your visitors. There are three kinds of visitor data assets:

- **Visitor attributes** hold types of information that specify one characteristic only. For example, there might be attributes named “years of experience,” “job description,” or “number of children.”
- **History attributes** and **history types**. These assets create a group of related information types that you can treat as a single item. For example, an item called “purchases” could be made up of the attributes “SKU,” “itemname,” “quantity,” and “price.” The item named “purchases” is called a **history type** and the individual attributes that comprise it (price, quantity, etc.) are called **history attributes** in Content Server Engage.

**Segments** are assets that categorize groups of visitors based on the visitor data that you are gathering about them. Marketers use the visitor data assets to create segments that define

groups of visitors with one or more characteristic in common: geographic location, gender, job description, item purchased, are examples.

You can define segments that are extremely broad (all first-time visitors, for example) or very focused (all first-time visitors who own RVs and live in Alaska).

- For information about creating visitor data assets, Chapter 35, “Creating Visitor Data Assets.”
- For information about creating segment assets, see the *CSEE User's Guide*.

## Recommendations

**Recommendations** are assets that determine which flex assets (products, for example) should be featured or “recommended” on a site page. Recommendation assets are rules that are based on the segments the visitors qualify, and, in some cases, relationships between the product or content assets.

One type of recommendation, the Dynamic List Recommendation, requires that you code a CSElement asset which returns the content that you wish to display.

Recommendations have templates. A recommendation returns a list of flex assets to its template when the template is rendered on a site page.

The items in a list of recommended flex assets are rated according to their importance to the current visitor based on the segments that the visitor belongs to.

For information about creating recommendations and coding Dynamic List elements, see Chapter 36, “Recommendation Assets.”

## Promotions

**Promotions** are assets that define an offer of value (a discount) to the visitors based on the flex assets that the visitor is buying and the segments that the visitor qualifies for. This value can be offered in several ways:

- A discount off the purchase price of the promoted flex assets
- A discount off the entire value of the shopping cart
- A discount off shipping charges
- A combination discount: a shipping discount with a price or cart discount

All promotions can have a duration, or a time period during which they are in effect.

For information about creating promotions, see the *CSEE User's Guide*.

## Persistent, Linked Visitor Sessions

A Content Server session ends when the visitor closes his or her browser. How do you link the data that you gathered about a visitor to that visitor when he or she returns to your online site? With a toolset of XML and JSP tags that CS-Engage provides, called the visitor data manager.

The visitor data manager object methods create a visitor context that enables you to link visitor sessions. You do this with persistent cookies and aliases implemented in a specific way.

For information about linking visitor sessions, Chapter 37, “Coding CS-Engage Pages.”

## Custom CS-Engage XML and JSP tags

In addition to the tag family that implements the linking of visitor sessions, CS-Engage several more custom tag families (both XML and JSP versions.) You use these tags to code pages that collect visitor data and to code the templates for your recommendations

- For information about coding pages that collect and use visitor data and coding templates for recommendations, see Chapter 37, “Coding CS-Engage Pages.”
- For information about all of the CS-Engage custom XML and JSP tags, see the *CSEE Developer's Tag Reference*.

## Analysis Connector

Analysis Connector is a data collection application that supports CS-Engage. It enables you to capture web site events such as visitor activity and clickstream data, providing an HTTP-based interface for exporting that data from the Content Server database to a third-party analysis tool. You can then analyze and use that information to create segments for CS-Engage or make changes to your site based on the information you gathered.

Analysis Connector collects the data you decide to collect in a highly efficient manner. The event data that you want to capture normally occurs during high-traffic periods, which is not a time when you want to degrade performance by constantly writing to the database.

Instead, Analysis Connector rapidly streams large volumes of data to a queue in the Java layer. As the queue fills up, the data is written to disk files. You configure a background process (the DatabaseLoader) to load data from the disk files into Content Server database tables during off-peak hours.

Following are examples of events you might want to capture and analyze:

- Clicks and page views
- Visitor demographic information
- Product structure information
- Cart item information
- Abandoned cart information
- Order and order item information

Analysis Connector consists of the following components:

- A set of property files (.ini files) that configure and manage Analysis Connector
- Custom tags that store and retrieve data
- Application elements
- Pages that make HTTP requests
- A DatabaseLoader process that loads event data into the Content Server database
- Five default tables that are designed to be used with CS-Engage

For information about Analysis Connector, see Chapter 39, “Using Analysis Connector.”



## Chapter 2

# CSEE Development Process

When you are developing an online site that is to be delivered from a CSEE content management system, you are actually designing two sites:

- The online site that is delivered from your delivery system and visited by readers and/or customers.
- The CSEE content management site that your content providers use to input the data that you use on your delivery system.

In other words, **you are responsible for the user experience of two sets of users:**

- The content providers who use the management system
- The site visitors who use your delivery system

When creating these two closely connected yet separate sites, the development team performs a series of planning, development, and testing steps. This chapter describes the development process in one possible sequence of events and in very general terms. Your own work flow will vary based on your work environment and business needs.

This chapter contains the following sections:

- Step 1: Set Up the Team
- Step 2: Create Functional and Design Specifications
- Step 3: Set Management System Requirements
- Step 4: Implement the Data Design
- Step 5: Build the Online Site
- Step 6: Set Up the Management System
- Step 7: Set Up the Delivery System
- Step 8: Publish to the Delivery System

## **Step 1: Set Up the Team**

The first step is to assemble the development team, which include the following kinds of people:

- Site designers
- XML and JSP developers
- Java application developers
- Database administrators
- System network administrators
- Marketers and advertising staff
- Product managers (if you are developing a commerce site)
- Content providers

You need people such as DBAs, system administrators, and content providers on your development team in addition to the people (like you) who do the actual coding for several reasons:

- Using a CSEE system requires you to design a data model in addition to creating a page design, which means that you need early input from the DBAs who will be supporting the databases on each system.
- Using a CSEE system means moving code and data around on multiple separate systems, several of which are probably clustered, which means you need early input from system and network administrators.
- Implementing a CSEE system will not be optimum unless the work habits of your content providers are accurately reflected in the design of the management system, which means you need early input from those who will use the management system.



## Step 2: Create Functional and Design Specifications

An online site delivered from a CSEE content management system is a holistic construct in which everything interacts, intersects, and works with everything else. Therefore, the second step is to create a functional specification and a design specification — to design your online site on paper.

You should complete some version of this step before you begin coding anything (although you might do some proof-of-concept coding while working on the design specification).

### Functional Requirements

Before you can begin a design specification, product management and marketing must provide the functional requirements for the online site.

### Page Design

After you obtain the functional requirements from your marketing folks, a good place to start is to map out all the types of pages that you want to present on the online site. For example: home page, section page, columnist page, search page, article page, and so on. If you are designing a commerce site, you need other kinds of pages: registration page, product category pages, product description page, article page, FAQ page, invoice page, and so on.

Determine the graphical, navigational, and functional features for each page and the site overall: navigation bars, buy buttons and shopping carts, “tell me more” buttons, search functions, logo placement, animated graphics, and so on.

If you are using CS-Engage, decide where the merchandising messages (recommendations) are to be placed on the pages and on which pages they’ll be placed. For example, perhaps each product category page has a “New Products” section in the upper-right corner of the page.

Map out the entire structure of the site and create mock-ups of it.

### Caching Strategy

One of the major elements in your design is caching: page caching and resultset caching. No online site can reach its performance goals without planning, testing, and implementing a caching strategy.

While designing the pages that you want to present on your online site, you must consider how and when page caching can and should be implemented for each piece on each page.

While designing your queries, you must map out all the tables in the database and determine how the resultset caching settings should be set for each table.

### Security Strategy (Access Control)

Will you require your visitors to identify themselves before they are allowed to access any part of your online site? You must determine what kinds of access control you want to enforce early in the design process so that you design your pages correctly.

For example, if you plan to check your visitors' identities before allowing them access to a page, this affects how you would cache the components of that page. For example, you could design a container page, which is never cached, that verifies the identity of the visitor and then assembles the page from cached pagelets only if the verification is successful.

## Separate Format from Content (Elements from Assets)

Following the basic proposition of separating content from format, take a look at each piece of each proposed page in your site and determine whether that piece should be represented as data or as logic.

A good design is one in which data is designed to be represented as an asset and is not embedded into element code. Examine every component of design or content, and then determine what your assets are. You make that determination by deciding which category a component belongs to: data or logic/code.

Simply speaking, do not code something into an element (embed it in logic) if it is really data. If it is data, it should be in a separate asset.

Here's another way to look at it:

- Assets that represent content are the responsibility of content providers.
- Logic—anything coded into any element—is the responsibility of the developers.

## Determine the Asset Types (Content)

Documents, articles, products, and images are easily identified as assets. However, design components such as headers and footers could also be assets:

- When the content in a header or footer is embedded in the code of an element, you or another developer has to change the text in it when anything in it changes (a phone number, a logo, and so on).
- When the content in a header or footer is in an asset, the code in your elements just needs to know how to obtain the identity of the asset; its content becomes the responsibility of a content provider.

Other page components that can be assets include the following kinds of things:

- Online polls
- Animation and other media
- Quote of the day
- Company or stock profiles
- Knowledgebase questions and answers

From your point of view, if the content for a component is represented in an asset, someone else is responsible for that content. You are only responsible for when and where it appears on your online sites and what it looks like when it appears there.

## Decide How to Handle Images and Other Blobs

You have two general options when deciding how to manage the images and other blobs that you want to use in your online site:

- Treat them as assets—store them in the Content Server database and have the BlobServer servlet serve them.

- Treat them as static files—put them in a file structure on your web server and let the web server serve them.

Either method is a valid option. If you keep your image files on the web server, you can create links to them with the CSEE tags, and there may be performance benefits when you allow your web server to deliver your images. However, if you keep your images and blobs separate from the Content Server database:

- You must implement a separate file management process. The publishing methods that move image assets from your management system to your delivery system cannot move content that is not in the Content Server database. You must manage this process on your own.
- None of the native CSEE security mechanisms will apply. That is, you cannot use ACLs to limit access to blobs that are not managed by CSEE.

## Map Out the Functional Design and Format (Elements)

You also need to analyze all of the functionality that you plan to incorporate into your online site. If you are designing a commerce site, parts of it will no doubt behave more like an application.

Outline what code or logic is required for your visitor registration pages, visitor data collection pages, shopping carts, personalization, and so on.

Remember that your CSEE system provides you with coding options: Java, XML, and JSP. As you look at each of the functions you want to provide, determine which is the best coding solution for that function.

## Data Design

Once you know which pieces of your site should be represented as assets, you can map out what your asset types should be. Each new asset type will use one or more database tables (depending on whether it is a basic or flex asset type).

### Asset Types

No matter which asset model you are using, basic or flex, consider the following when you design your asset types:

- Asset type design affects both of the user groups that you are designing for (visitors to the online site and the content providers who must enter the data).
- Which types of assets need to be linked or related to other assets of other types in order to successfully implement your page design? Be sure to implement these relationships in the asset type.
- Content providers appreciate efficiency. Be sure that your asset types store only the data that you really plan to use so that content providers do not waste time maintaining data that no one uses.

### Auxiliary Tables That Support Your Asset Types

The data design that you want to implement for your system extends beyond the database tables that hold your assets. Depending on the kinds of information that you want to provide, you might need to create auxiliary tables that support your asset types.

For example, the Burlington Financial sample site has asset types with a **Mimetype** field. The **Mimetype** field is a drop-down field and a user must select a value from the drop-

down list. These values are pulled from a lookup table named `Mimetype`. Depending on your needs, you might need to create similar tables for your system.

Your DBAs should be involved in your discussions about the asset types and auxiliary tables that you plan to create so they can understand from the start the kind of database tuning issues that might arise on the management and delivery systems.

## Visitor Data

If you are using CS-Engage (and, optionally, Analysis Connector), you also need to determine what kinds of visitor data you plan to gather. These data types are represented by the CS-Engage visitor data assets that you use to create segments for personalizing your site based on the identify of the visitor. (For example, demographics, purchase history, or clickstream information.)

If you are using the Analysis Connector application, you have five default Analysis Connector tables that support CS-Engage. However, your goals may require you to create additional tables to support the kinds of data you want to collect and analyze.

After your CSEE system goes live and you start collecting visitor data, the tables that store that data grow very quickly. This is another area that you need to consult your DBAs about.

## Step 3: Set Management System Requirements

Before you can begin coding, you must know how the management system will be organized. These decisions affect your design because your design is dependent on the CSEE “site.”

A CSEE site is an object that you use as an organizational construct for an actual online site and as an access control tool. When you create template assets, CS-Direct creates an entry in the `SiteCatalog` table for it. The naming convention that CS-Direct uses for the page entries for templates includes the name of the CSEE site that you are creating the template for. This means that you must be consistent with site names throughout your entire content management system (development system, management system, and delivery system) and you must know the names of the sites that you are using before you begin coding.

Although your primary concern is the name of each site, the system administrators and business managers must also determine the following:

- How many users and ACLs (access control lists) do you need? (Remember that you may need to create ACLs to assign to the visitors of the online site, as well.)
- How many site roles do you need?
- Which asset types need a workflow process?
- Which asset types should use revision tracking?
- Who should have access to which asset types on which sites?

Use both this book and the *CSEE Administrator's Guide* to help you make these decisions.

## Step 4: Implement the Data Design

After you have created your design specification and you understand the organization of the management system, you can implement the data design.

On the development system, you complete the following kinds of tasks:

- Create CSEE sites with the same names as those that will be used on the management system.
- Design and create your asset types.
- Add any lookup tables or other auxiliary tables for the asset types.
- Create sample assets of each type.
- If you are using Analysis Connector, create any additional database tables that you need to hold visitor data.

This step (step 4) and the next step (Build the Online Site) are iterative and will most likely overlap a great deal. While you need to create asset types so that you can create assets before you create templates for them, it is likely that you will uncover areas that need refinement in your data design only after you have coded a template and tested the code.

Refer to Section 3, “Data Design,” when you implement the data design of your online site.

## Step 5: Build the Online Site

After you have sample assets of even one type created on the development system, you can begin coding templates and building the online site. (Actually, you can begin coding elements that do not display assets any time after you have created your design specification.)

In this step, you complete the following kinds of tasks:

- Create the page, query, and collection assets that implement the functionality of your online site.
- If you are using CS-Engage, create the visitor data assets, sample segments, recommendations, and sample promotions.
- Create template assets (and code template elements) for all of your asset types.
- If you are using the InSite Editor feature, add code to the templates that invokes it.
- Code the CSElements that implement underlying functionality (that do not display assets).
- If you are developing a commerce site, code pages that implement the CS-Direct Advantage shopping cart.
- If you are using CS-Engage, code pages that collect visitor data.
- If you are using Analysis Connector, code pages that capture visitor events.
- Test everything—most likely you will perform both usability and market testing for your online site.

Refer to Section 4, “Site Development,” and Chapter 3, “Programming with CSEE” as you build your online site.

## Step 6: Set Up the Management System

After you have the online site working on your development system, you move it to the management system.

The developers complete the following kinds of tasks:

- Create the sites.
- Re-create the asset types.
- Mirror the asset type tables and auxiliary table from the development system to the management system.
- Mirror publish the site design assets and the data structure assets created on the development system to the management system.

The system administrators then complete the following kinds of tasks:

- Create users, ACLs, and roles. Assign users their roles for each CSEE site.
- Configure CS-Desktop users, if you are using that feature.
- Create workflow processes.
- Create StartMenu shortcuts.
- Enable revision tracking.

Refer to the *CSEE Administrator's Guide* for information about setting up the management system.

### Import Content as Assets

It is likely that you already have content in some non-asset format that you want to use. To import this content into the Content Server database as assets, use the XMLPost utility.

### Import Catalog Data and Flex Asset Data

If you are using the flex asset model and you have a large amount of pre-existing data that you want to use, you can import it with the BulkLoader utility. For systematic updates, however, you use the XMLPost utility.

### Instruct the Editorial Team About Site Design

Before the editorial team can successfully maintain the online site, they need to understand your design. For example: how frequently are collections supposed to be rebuilt?

If you are using the basic asset model, content providers need to know the following:

- Which categories and sources they should assign to their assets in order for their assets to be located by the appropriate queries and collections.
- Which templates they should assign to which assets.

- Which association fields must be filled out in order for the links on the site pages to function correctly.

It is a good idea to program as much of this information as possible into the Start Menu shortcuts that you and the system administrators create for each asset type.

If you are using the flex asset model, content providers need to know the following:

- The general hierarchy or taxonomy in place for the flex assets.
- Some information about what information a flex asset inherits.
- Which templates they should assign to which assets.

## Step 7: Set Up the Delivery System

When you set up the delivery system, you complete several of the same steps that you complete for the management system. For example:

- Re-create the sites.
- Re-create the asset types (but without their Start Menu shortcuts).
- Mirror the asset type tables and auxiliary table from the development system to the management system.

And then you publish all of the assets on the management system to the delivery system.

Also, because this system is not a management system, you complete the following steps as well:

- Implement your security strategy.
- On the web server, map the URL of your site (www.yourcompany.com) to the Content Server URL of your home page.

For information about setting up the delivery system, see the section on publishing in the *CSEE Administrator's Guide*.

## Step 8: Publish to the Delivery System

When the content on the management system is ready, you publish it to the delivery system. After intensive testing—both performance and load—you open your site to the public.





## Section 2

# Programming Basics

This section provides basic programming information for coding online sites using the toolsets delivered with the CSEE products.

It contains the following chapters:

- Chapter 3, “Programming with CSEE”
- Chapter 4, “Page Design and Caching”
- Chapter 5, “CSEE Tools and Utilities”
- Chapter 6, “Sessions and Cookies”
- Chapter 7, “Error Logging and Debugging”



## Chapter 3

# Programming with CSEE

In addition to managing your content, CSEE handles many useful tasks for you, including storing web pages and pieces of web pages—called **pagelets**—in CSEE caches, and maintaining those caches so that visitors to your website never see an outdated page. In order for CSEE to do this, you must code with CSEE tags and Java methods.

A CSEE page is composed of various **element assets**—blocks of code that can retrieve the content of your pages from the Content Server database, or that perform other tasks, such as deleting outdated items from the database—and **template assets**, which are generally used to format the content of your web pages. Elements and templates can be written in a number of scripting and markup languages, including HTML, XML, JSP, CSS, and JavaScript. Note, however, that Content Server only evaluates XML and JSP.

This chapter gives you a brief overview of programming with Content Server Enterprise Edition (CSEE). It contains the following sections:

- Choosing a Coding Language
- The Content Server Context
- CSEE JSP
- CSEE XML
- CSEE Tags
- Variables
- Other CSEE Storage Constructs
- Values for Special Characters

## Choosing a Coding Language

Choose your coding or markup language based on what the element or template that you are creating does. For example, you typically use HTML and XML for page layout and JSP and Java for logic. Elements that display content that may change, such as a newspaper article, should usually be written in XML or JSP. This is because such elements use logic to retrieve their content from the CSEE database, and thus are managed using CSEE XML or JSP tags.

CSEE also has a Java API, which you will use in conjunction with CSEE JSP tags if you choose JSP as your coding language.

The following table lists the situations to which each language is best suited:

Code	When to Use
XML	<ul style="list-style-type: none"> <li>• The element contains mostly text, with few loops and conditionals.</li> </ul>
JSP	<ul style="list-style-type: none"> <li>• The element requires conditional operators, or relational operators other than = or !=.</li> <li>• The element uses many loops. Loops perform better in JSP than in XML.</li> <li>• The element contains calls to Java code.</li> </ul>

Note that elements written in XML or JSP can call any type of element, but you cannot mix XML and JSP in the same element. For example, an element written in either XML or JSP can call another element written in HTML, XML, or JSP. However, an element written in HTML cannot call an element written in XML or JSP.

## The Content Server Context

When you code for a CSEE project, you code within the Content Server context. The Content Server context provides access to the Java servlets that compose CSEE, and to the CSEE Java objects whose methods and tags allow you access to CSEE functionality.

You code in the Content Server context no matter what language you code your project in; CSEE XML and JSP tags provide an easy-to-use interface to Content Server's Java objects, so that even web designers with little or no Java experience can create CSEE web pages.

## The ICS Object

When you are coding for CSEE, you often access the methods and tags of the Interface to Content Server (ICS) object. The ICS object encapsulates some of CSEE's core functionality, allowing you to access servlets that control the CSEE tree (the *TreeManager* servlet) and the input of data into the database (the *CatalogManager* servlet).

You also use ICS methods and tags to perform tasks such as creating and displaying variables and using *if/then* statements to perform tasks based on specified conditions. For a complete list of the ICS object's methods and tags, see the *CSEE Developer's Tag Reference* and the *CSEE Java API Reference*.

## The FTCS tag

Each CSEE element or template begins and ends with the `ftcs` tag. This tag creates the Content Server context, alerting Content Server that code contained within the opening and closing `ftcs` tags will contain CSEE tags and access ICS methods.

If you use the CSEE user interface or the Content Server Explorer tool to create elements and templates, the opening and closing `ftcs` tags are automatically added after the standard directives. You must code within the opening and closing `ftcs` tags; CSEE is unaware of any code which falls outside of these tags.

If you create element and template code using some other method, you must add the opening `ftcs` tag after your directives, and use the closing `ftcs` tag as the last line of your code.

## CSEE JSP

JSP programmers have a set of standard tools at their disposal, including directives, actions, and JSP objects. If you are programming in JSP within Content Server, you have access to many of these features. Sometimes, however, you must substitute a CSEE tag for a JSP directive or action, or access a CSEE object rather than one of JSP's implicit objects.

The following sections detail the differences between standard JSP and CSEE JSP, and how standard JSP functionality maps to CSEE tags and methods:

- CSEE Standard Beginning
- JSP Implicit Objects
- Syntax
- Actions
- Declarations
- Scriptlets and Expressions
- JSP Directives
- CSEE Tag Libraries

## CSEE Standard Beginning

If you use either the Content Server user interface or Content Server Explorer to create your template assets, CSElement assets, and non-asset elements, CSEE automatically seeds the element or template with a standard beginning.

The standard beginning for a JSP element in Content Server Explorer follows:

```
<%@ taglib prefix="cs" uri="futuretense_cs/ftcs1_0.tld" %>
<%@ taglib prefix="ics" uri="futuretense_cs/ics.tld" %>
<%@ taglib prefix="satellite" uri="futuretense_cs/satellite.tld"
%>
<%//
// elementName
//
// INPUT
//
// OUTPUT
```

```
//%>
<%@ page import="COM.FutureTense.Interfaces.FTVallList" %>
<%@ page import="COM.FutureTense.Interfaces.ICS" %>
<%@ page import="COM.FutureTense.Interfaces.IList" %>
<%@ page import="COM.FutureTense.Interfaces.Utilities" %>
<%@ page import="COM.FutureTense.Util.ftErrors" %>
<%@ page import="COM.FutureTense.Util.ftMessage"%>
<cs:ftcs>

<!-- user code here -->

</cs:ftcs>
```

If you use the Content Server user interface to create Template and CSElement assets, you will also see a standard beginning similar to the preceeding code sample. The standard beginning for these assets imports additional tag libraries for use with basic assets and includes tags that log dependancies between the Template and CSElement assets and the content that they render.

If you use a tool other than Content Server Explorer or the Content Server user interface to create your elements and templates, you must copy the standard beginning into your code verbatim.

The following sections explain the standard beginning for Content Server Explorer.

## Taglib Directives

The following taglib directives import the base tag libraries that you will use with Content Server. If you use the CSEE user interface to create template and CSElement assets, you will see additional taglib directives in your seed code.

```
<%@ taglib prefix="cs" uri="futuretense_cs/ftcs1_0.tld" %>
<%@ taglib prefix="ics" uri="futuretense_cs/ics.tld" %>
<%@ taglib prefix="satellite" uri="futuretense_cs/satellite.tld" %>
```

The first directive imports the `ftcs1_0` tags, which create the FTCS context. These tags are used in each template or element that you create, and indicate that the code enclosed by them will be controlled by Content Server.

The second directive imports the `ics` tags, which provide access to CSEE's core functionality.

The third directive imports the `satellite` tags, which are for use with CS-Satellite.

For more information about these tag libraries, see "CSEE Tag Libraries" on page 66.

For information about commonly used tags that are found in these tag libraries, see "CSEE Tags" on page 70.

To add additional taglib directives to these defaults, modify and save the `OpenMarket/Xcelerate/AssetType/Template/ModelJsp.xml` file.

## Page Directives

The following page directives import the base Java interfaces that you will use with CSEE:

```
<%@ page import="COM.FutureTense.Interfaces.FTVallList" %>
<%@ page import="COM.FutureTense.Interfaces.ICS" %>
<%@ page import="COM.FutureTense.Interfaces.IList" %>
<%@ page import="COM.FutureTense.Interfaces.Utilities" %>
<%@ page import="COM.FutureTense.Util.ftErrors" %>
<%@ page import="COM.FutureTense.Util.ftMessage"%>
```

The first page directive imports the `FTVallList` interface, which creates a list of name/value pairs that you use to pass arguments to Content Server subsystems like the `CatalogManager` and `TreeManager`.

The second page directive imports the `ICS` interface, which provides access to the core Content Server functionality.

The third page directive imports the `IList` interface, which contains the methods to access the rows in a Content Server query or list object. It also contains the methods that a third party must implement when attempting to construct and register a list object for use within an Content Server XML page.

The fourth page directive imports the `Utilities` interface, which provides a simple interface for some common tasks such as formatting dates, reding and writing files, and sending email.

The fifth page directive imports the `ftErrors` class, which contains error codes.

The sixth page directive imports the `ftMessage` class, which contains error messages used by CSEE.

To add additional page directives to the standard directives for JSP elements, modify and save the `OpenMarket/Xcelerate/AssetType/Template/ModelJsp.xml` file.

## The cs:ftcs Tag

Each CSEE JSP template or element must have the `cs:ftcs` tag as its first and last tags. This tag creates the Content Server context, alerting Content Server that code contained within the opening and closing `cs:ftcs` tags will contain CSEE tags.

You must code within the opening and closing `cs:ftcs` tags; CSEE is unaware of any code which falls outside of these tags.

## JSP Implicit Objects

JSP provides several implicit objects that are available for developers to use. In the CSEE context, however, you are often dealing with CSEE's objects, and should use CSEE JSP tags and Java methods to access these objects, instead of using JSP's implicit objects.

The following table maps JSP's implicit objects and some of their commonly used methods to the CSEE tag or method that you should use to replace them.

Object	Method	CSEE Tag or Method
request	getParameter	ics:getvar tag
	getParameterNames	ICS.GetVars() method
	getCookie	ics:getCookie tag
response	addCookie	satellite:cookie tag
session	getAttribute	ics:getssvar tag
	setAttribute	ics:setssvar tag
out	println	ics:getvar tag or render:stream tag

## Syntax

CSEE uses standard JSP syntax.

When you are nesting tags, however—for example, using a JSP expression as the value of a JSP tag's parameter—remember to use single quotes to contain the expression, as in the following example:

```
name='<%=ics.GetVar("myVariable")%>'
```

## Actions

Standard JSP allows developers to use several different actions. The following table describes what actions should be replaced with CSEE tags and which can be used as usual:

Action	CSEE
<jsp:forward>	Use the render:satellitepage or render:callelement tags instead.
<jsp:getproperty>	Use this for custom Java Beans. If you want to find the value of one of the CSEE properties, use the <ics:getproperty> tag.
<jsp:include>	Use the render:satellitepage or render:callelement tags instead.
<jsp:setProperty>	Use this to set properties in custom Java Beans. Use the CSEE Property Editor to set CSEE properties.



Action	CSEE
<code>&lt;jsp:useBean&gt;</code>	Use this for custom Java Beans.

## Declarations

In standard JSP, you usually declare variables within a JSP declaration. In CSEE, you use the `ics:setvar` tag to declare variables that are available in the Content Server context.

For more information about CSEE variables, see “Variables” on page 83.

## Scriptlets and Expressions

You can use scriptlets and expressions without any variation from normal JSP usage.

When you use an expression as the value of the parameter for a CSEE JSP tag, however, be sure that you nest quotation marks correctly, as described in “Syntax” on page 64.

## JSP Directives

When you are coding JSP in a Content Server context, there are some caveats for using directives, which are outlined in the following table:

Directive	CSEE
IncludeDirective	Use the <code>render:satellitepage</code> or <code>render:callelement</code> tags to include other files in your JSP pages.
Page Directive	<p>If you use the CSEE user interface or the Content Server Explorer tool to create elements or templates, your element or template is automatically seeded with standard page directives.</p> <p>In addition to the standard directives, you must add two page directives to set the <code>contentType</code> and <code>session</code> for each CSEE element or template that you create.</p> <ul style="list-style-type: none"> <li>Set your page’s content type to <code>text/html</code> and the character set to UTF-8 by providing the following page directive as the first line of every CSEE JSP file: <pre>&lt;%@ page contentType="text/html; charset=UTF-8" %&gt;</pre> </li> <li>CSEE handles sessions for your JSP pages, so you should also disable HTTP sessions for your page. To disable HTTP sessions for the current page, provide the following page directive: <pre>&lt;%@ page session="false" %&gt;</pre> </li> </ul>
Taglib Directive	<p>CSEE automatically seeds your templates and elements with commonly used taglib directives.</p> <p>You can add additional CSEE taglib directives to an element or template asset as needed; a list of the CSEE tag libraries follows this table.</p>

## CSEE Tag Libraries

CSEE has a series of JSP tag libraries that correspond to functions in CSEE's APIs.

The following table lists the CSEE tag libraries and describes their functions. Use this table as a reference when deciding which tag libraries to import into your JSPs.

### Tag Libraries for Both Basic and Flex Assets

Tag Library	Description
<code>acl.tld</code>	Tags for creating and manipulating Access Control Lists.
<code>date.tld</code>	Tags that convert dates with year, month, day, and optional hour, minute, and am/pm fields into epoch format long integers representing milliseconds since Jan 1, 1970, 0:00 GMT. Date tags also convert long integers into dates.
<code>dir.tld</code>	Directory Services tags.
<code>ftcs1_0.tld</code>	Tags that create the FTCS context. These tags are used in each template or element that you create, and indicate that the code enclosed by them will be controlled by Content Server.
<code>ics.tld</code>	Tags which provide access to core Content Server functionality, including access to the CatalogManager and TreeManager commands, and basic coding constructs like if/then statements.
<code>insite.tld</code>	Tags for InSite Editor.
<code>localestring.tld</code>	Tags for localizing text strings.
<code>name.tld</code>	Tags that access the name of the user who is currently logged in to CSEE and manipulate usernames in directory services.
<code>object.tld</code>	Tags for manipulating Content Server objects.
<code>portal.tld</code>	Tags that were created for CSEE's portal example. The portal tags generate a random value, and logs a publishing dependency.
<code>property.tld</code>	Tags for retrieving values from CSEE property files.
<code>render.tld</code>	Tags that render basic assets.
<code>satellite.tld</code>	Tags for CS-Satellite; with the exception of the <code>satellite.tag</code> tag, you will use satellite versions of the render tags found in the <code>render.tld</code> file.
<code>soap.tld</code>	CSEE SOAP tags.
<code>time.tld</code>	Tags that get and set the timing for determining the performance of elements.
<code>user.tld</code>	Tags to log users in and out of CSEE.

Tag Library	Description
<code>webservices.tld</code>	Web services tags that allow you to consume certain types of public web sites as part of a CSEE page.

## Tag Libraries for Basic Assets

Tag Library	Description
<code>asset.tld</code>	Tags that retrieve and manipulate basic assets.
<code>siteplan.tld</code>	Tags that allow access to the site plan tree. You use these tags to create navigation for a site that uses basic assets.

## Tag Libraries for Flex Assets

Tag Library	Description
<code>assetset.tld</code>	Tags for creating assetsets with flex assets.
<code>blobservice.tld</code>	Tags for retrieving and manipulating blobs that are attributes of flex assets.
<code>calculator.tld</code>	Tags that provide basic calculator and boolean functions.
<code>cart.tld</code>	Tags that allow you to add, delete, and otherwise manipulate items in a shopping cart object.
<code>cartset.tld</code>	Tags that allow you store, retrieve, delete, and list shopping cart objects for a registered buyer.
<code>commercecontext.tld</code>	Tags that access the objects in the CS-Direct Advantage visitor context.
<code>csmac.tld</code>	Tags that generate Message Authentication Codes (MACs) that are used by Transact.
<code>csuser.tld</code>	Tags that create and maintain user information for Transact.
<code>currency.tld</code>	Tags that convert floating point values and currency strings, and perform formatting and rounding operations on currency strings.
<code>decimal.tld</code>	Tags that format floating point values as decimal objects in different locales.
<code>hash.tld</code>	Tags that allow you to cast an <code>IList</code> as a hash table and search it by key.
<code>listobject.tld</code>	Tags that construct Content Server resultset lists, which are used throughout your elements as arguments for other CS-Direct Advantage tags.

locale1.tld	Tags that generate a locale object, which is used to describe the desired locale for various other tags in the system.
misc.tld	Miscellaneous tags, including a tag that returns the names of all the columns in an input list
searchstate.tld	Tags for creating searchstates to constrain groups of flex assets (assetsets).
session.tld	A tag that flushes all stored objects for a given session.
string.tld	Tags that perform string manipulations.
textformat.tld	Tags that format text.
vdm.tld	Visitor Data Management tags, which enable you to record and retrieve information about website visitors from Content Server, or from other databases.

For complete descriptions of the CS-Direct tags used for template development, see the *CSEE Developer's Tag Reference*.

## CSEE XML

This section explains the basics of CSEE XML. CSEE XML uses standard XML syntax and is defined by the `futuretense_cs.dtd`. As with CSEE JSP tags, CSEE XML tags provide access to Content Server servlets and objects.

The following sections describe things to be aware of when coding with CSEE XML.

### CSEE Standard Beginning

If you use the CSEE user interface or the Content Server Explorer tool to create your templates and elements, CSEE automatically seeds the element with the following standard beginning:

```
<?xml version="1.0" ?>
<!DOCTYPE ftcs SYSTEM "futuretense_cs.dtd">
<ftcs version="1.2">
</ftcs>
```

If you use some other tool to create your elements and templates, you must copy this code into them verbatim.

The following sections explain this standard beginning.

## XML Version and Encoding

The first line in any CSEE XML template or element must set the XML version, as follows:

```
<?xml version="1.0"?>
```

Note that in order for your element to run, `<?xml version="1.0"?>` must be the first line in the element, with no spaces before the text. The line must also have a hard return at the end, placing it on its own line.

If you need to set the encoding for this template or element, you can do this as follows:

```
<?xml version="1.0" encoding="utf-8"?>
```

## The .dtd File

CSEE XML is defined by the `futuretense_cs.dtd` file. You must import this file into each CSEE element or template that you code by entering the following line immediately after the XML version statement:

```
<!DOCTYPE ftcs SYSTEM "futuretense_cs.dtd">
```

## The FTCS Tag

Each CSEE XML template or element must have the `ftcs` tag as its first and last tags. This tag creates the Content Server context, alerting Content Server that code contained within the opening and closing `FTCS` tags will contain CSEE tags.

You must code within the opening and closing `ftcs` tags; CSEE is unaware of any code which falls outside of these tags.

## XML Entities and Reserved Characters

Because symbols such as `<` and `>` are reserved characters in XML, you must not place them in your content. For example, the following code confuses the XML parser because the less-than sign (`<`) appears inside some text:

```
<P>4 < 7</P>
```

You must use character entities in place of reserved characters. Character entities begin with `&#` and end with a semicolon. Between the `&#` and the semicolon, you specify the decimal Latin-1 (a superset of ASCII) value of the character. For example, the decimal Latin-1 value of the `<` character is 60, so the correct way to code the preceding line in XML is:

```
<P>4 &#60; 7</P>
```

See the “Values for Special Characters” section of this chapter for a list of these character entities.

## XML Parsing Errors

The XML parser that processes CSEE tags ensures that the tags are syntactically correct. This simplifies tracking down hard-to-find problems related to tagging syntax errors. A misspelled tag name is not reported as an error. This is because the XML parser doesn't require all tag names to exist in the DTD.

When a page request is made to a CSEE system and an XML syntax error is detected, the results streamed back will contain useful information to help you locate the problem. The

results include a general error description, followed by the line/column location of the error. For example, the following error reports a bad parameter name:

```
Illegal attribute name NAM Illegal attribute name NAM
Location: null(6,11)
Context:
```

And the next error reports an incorrect tag nesting:

```
Close tag IF does not match start tag THEN Close tag IF does
not match start tag THEN
Location: null(13,3)
Context:
```

The XML parser also detects run-time errors. These are errors where the XML tags are syntactically correct, however, some error in the structure is detected during processing. For example, the following error reports an invalid use of ARGUMENT:

```
Failed to run template:c:\FutureTense\elements\dan.xml Runtime
error Argument invalid [Argument 5]
Containing tag: FTCS
```

## CSEE Tags

CSEE has an extensive set of tags in both JSP and XML that allow you to access the various functions of Content Server and the Content Applications. You use these tags in conjunction with HTML, Java, JavaScript, and custom tags that you create, to code your web site.

This section provides an overview of the tags that you are most likely to use in your template assets and elements. For complete information on all of the CSEE tags, see the *CSEE Developer's Tag Reference*.

The tags discussed here are arranged by usage, as follows:

- Tags That Create the Content Server Context
- Tags That Handle Variables
- Tags That Call Pages and Elements
- Tags That Create URLs
- Tags That Control Caching
- Tags That Set Cookies
- Programming Construct Tags
- Tags That Manage Compositional and Approval Dependencies
- Tags That Retrieve Information About Basic Assets
- Tags That Create Assetsets (Flex Assets)
- Tags That Create Searchstates (Flex Assets)

## Tags That Create the Content Server Context

The following section describes tags that create the Content Server context in which you code. You use these tags in every template or element that you write.

FTCS (XML)	ftcs1_0:ftcs (JSP)
<FTCS>	<ftcs1_0:ftcs>
</FTCS>	</ftcs1_0:ftcs>

The FTCS tag creates the Content Server context. The opening FTCS tag should be the first tag in your code, and the closing FTCS tag should be the last tag in your code.

Content Server is unaware of anything that falls outside of the opening and closing FTCS tags.

satellite.tag (XML)	satellite:tag (JSP)
<satellite.tag type="open close"/>	<satellite:tag>  <satellite:parameter [name= `name`] value = `open closed`/> </satellite:tag>

Tells the Satellite servlet (which provides a layer of automatic caching) that this code contains a `satellite.page`, `satellite.link`, `satellite.cookie`, or `satellite.blob` tag. If this code contains `satellite.page` or `satellite.blob` directives or any form or other form, then you must provide the `satellite.tag` pair. If you omit the pair, CS-Satellite streams the page without parsing it.

If this pagelet does *not* contain `satellite.page`, `satellite.blob`, or `render:getpageurl` tags, then you can omit the `satellite.tag` pair. If you mistakenly provide the `satellite.tag` pair, CS-Satellite still serves the page but performance may suffer.

If you do need the `satellite.tag` pair, FatWire strongly recommends setting the "open" tag as the first tag in your element and the "close" tag as the last tag in your element, in between the `ftcs` tags.

## Tags That Handle Variables

The following tags handle variables in CSEE.

CSVAR (XML)	ics:getvar (JSP)
<code>&lt;CSVAR   NAME="variableName" /&gt;</code>	<code>&lt;ics:getvar   name="variableName" /&gt;</code>

CSVAR displays the value of a variable, session variable, built-in, or counter.

SETVAR (XML)	ics:setvar (JSP)
<code>&lt;SETVAR   NAME="variableName"   VALUE="variableValue" /&gt;</code>	<code>&lt;ics:setvar   name="variableName"   value="variableValue" /&gt;</code>

SETVAR sets the value of a regular, Content Server variable. The value of the variable exists for the duration of the page evaluation unless it is explicitly deleted using REMOVEVAR.

SETSSVAR (XML)	ics:setvar (JSP)
<code>&lt;SETSSVAR   NAME="variableName"   VALUE="variableValue" /&gt;</code>	<code>&lt;ics:setssvar   name="variableName"   value="variableValue" /&gt;</code>

SETSSVAR sets a session variable.

REPLACEALL (XML)	ics:resolvevariables (JSP)
<code>&lt;REPLACEALL   NAME="variableName"   VALUE="variableValue" /&gt;</code>	<code>&lt;ics:resolvevariables   name="variableName"   [output="variable name"]   [delimited="true false"] /&gt;</code>

REPLACEALL and ics:resolvevariables resolve multiple Content Server variables. In other words, when you want to use Content Server variables in HTML tags, you use these tags to resolve the variables.

For more information about variables in CSEE, see “Variables” on page 83.



## Tags That Call Pages and Elements

Use the following tags to call elements or templates.

RENDER.SATELLITEPAGE (XML)	render:satellitepage (JSP)
<pre>&lt;RENDER.SATELLITEPAGE   PAGENAME="<i>nameOfPageEntry</i>"   [CACHECONTROL="<i>expiration_date_and_time</i>" ]   [ARGS_var1="<i>value1</i>" ]/&gt;</pre>	<pre>&lt;render:satellitepage   pagename="<i>nameOfPageEntry</i>"   [cachecontrol="<i>expiration_date_and_time</i>" ]&gt;   &lt;[render:argument     name="<i>variable1</i>"     value="<i>value1</i>" ]/&gt; &lt;/render:satellitepage&gt;</pre>

RENDER.SATELLITEPAGE requests a CSEE pagelet and caches that pagelet in both Content Server and CS-Satellite, if the pagelet is not already in cache. If you wish to call a page or pagelet without caching it individually, use the RENDER.CALLELEMENT tag.

RENDER.SATELLITEPAGE has a stacked scope, so the only variables available to the page are ones that you explicitly pass in.

RENDER.CALLELEMENT (XML)	render:callelement (JSP)
<pre>&lt;RENDER.CALLELEMENT   ELEMENTNAME="<i>nameOfElement</i>"   [ARGS_var1="<i>value</i>" ]/&gt;</pre>	<pre>&lt;ics:callelement   element="<i>element name</i>"&gt;   &lt;ics:argument name="<i>argument name</i>" value="<i>arg value</i>" /&gt; &lt;/ics:callelement&gt;</pre>

RENDER.CALLELEMENT is similar to the RENDER.SATELLITEPAGE tag in that both tags call other Content Server code, either in an element or in a page. However, code called by RENDER.CALLELEMENT does not get cached as an individual page or pagelet on CS-Satellite.

Use RENDER.CALLELEMENT to process the content of an element that you wrote for the CS Content Applications and you want the scope of that element to be stacked. The element must exist in the ElementCatalog.

## Tags That Create URLs

RENDER.GETPAGEURL (XML)	render:getpageurl (JSP)
<pre> &lt;RENDER.GETPAGEURL OUTSTR="myURL" PAGENAME="SiteCatalogPageEntry" cid="IDofAsset" [p="IDofParentPage"] [c="AssetType"] [ADDSSESSION="true"] [DYNAMIC="true"] [PACKEDARGS="stringFromPACKARGS tag"] [ARGS_xxx="y"] /&gt; </pre>	<pre> &lt;render:getpageurl outstr="myURL" pagename="SiteCatalogPageEntry" cid="IDofAsset" [p="IDofParentPage"] [c="AssetType"] [addsession="true"] [dynamic="true"] [packedargs="stringFromPACKARGStag"]   &lt;[render:argument name="xxx" value="yyy"] /&gt; &lt;/render:getpageurl&gt; </pre>

This tag creates a URL for an asset, processing the arguments passed to it into a URL-encoded string and returning it as the variable specified by the OUTSTR parameter. If rendermode is set to export, the tag creates a file name for a static HTML file (unless you specify that you want a dynamic URL). If rendermode is set to live, the tag creates a dynamic URL.

RENDER.SATELLITEBLOB (XML)	render:satelliteblob (JSP)
<pre> &lt;RENDER.SATELLITEBLOB SERVICE="HTMLtagName" BLOBTABLE="blobTable" BLOBKEY="primaryKeyName" BLOBWHERE="primaryKeyValue" BLOBCOL="columnName" BLOBHEADERNAMEN="headername" BLOBHEADERVERVALUEN="mimetype" [ARGS_format1="5"] [CACHECONTROL="expirationDateA ndTime"] /&gt; </pre>	<pre> &lt;render:satelliteblob service="HTMLtagName" blobtable="blobTable" blobkey="primaryKeyName" blobwhere="primaryKeyValue" blobcol="columnName" blobheadernameN="headername"   blobheadervervalueN="mimetype" [cachecontrol="expirationDateAndTime"]&gt;   &lt;[render:argument name="format1" value="5"] /&gt; &lt;/render:satelliteblob&gt; </pre>

This tag creates an HTML tag with a BlobServer URL for assets that are blobs. For example, imagefile assets from the Burlington Financial sample site are blobs stored in the Content Sever database which means they must be served by the BlobServer servlet. This tag creates an HTML tag that instructs a browser how to find and format the specified blob.

## Tags That Control Caching

The following tag allows you to control whether or not the output of the current template or element gets cached.

### ics.disablecache (XML)

```
<ics.disablecache/>
```

### ics:disablecache (JSP)

```
<ics:disablecache/>
```

Use `ics.disablecache` in conjunction with `if/then` statements that check for error conditions; if an error is present, the resulting rendered page will not be cached.

For complete information and code samples for the `ics.disablecache` tag, see “Ensuring that Incorrect Pages Are Not Cached” on page 507.

## Tags That Set Cookies

The following tag sets cookies in CSEE.

### satellite.cookie (XML)

```
<satellite.cookie
  name="cookie_name"
  value="cookie_value"
  timeout="timeout"
  secure="true|false"
  url="URL"
  [domain="domain"]/>
```

### satellite:cookie (JSP)

```
<satellite:cookie>
  <satellite:parameter name='name'
    value='cookie_name' />
    <satellite:parameter name='value'
      value='cookie_value' />
      <satellite:parameter name='timeout'
        value='cookie_timeout' />
        <satellite:parameter name='secure'
          value='true|false' />
          <satellite:parameter name='url'
            value='url' />
            </satellite:cookie>
```

`satellite.cookie` sets a cookie on the user’s browser. This tag is the only way to set cookies in either XML or JSP.

## Programming Construct Tags

The following tags allow you to use basic programming constructs.

IF/THEN/ELSE (XML)	ics:if/ics:then/ics:else (JSP)
<pre>&lt;IF COND="LOGICAL_EXPRESSION"&gt;   &lt;THEN&gt;     tags and/or text   &lt;/THEN&gt;   &lt;ELSE&gt;     tags and/or text   &lt;/ELSE&gt; &lt;/IF&gt;</pre>	<pre>&lt;ics:if condition="logical expression"&gt;   &lt;ics:then&gt;     tags and/or text   &lt;/ics:then&gt;   &lt;ics:else&gt;     tags and/or text   &lt;/ics:else&gt; &lt;/ics:if&gt;</pre>

IF, THEN, ELSE determine conditions. You typically use these tags to determine the value of a variable.

LOOP (XML)	ics:listloop (JSP)
<pre>&lt;LOOP [FROM="START" ]       [COUNT="LOOP_TIMES" ]       [LIST="LIST_NAME" ]       [UNTIL="END" ]&gt;   ... &lt;/LOOP&gt;</pre>	<pre>&lt;ics:listloop   listname="some list"   [maxrows="number of loops" ]   [startrow="start row" ]   [endrow="end row" ]/&gt;</pre>

LOOP and `ics:listloop` iterate through items in a list. Remember that excess code within these tags affects the performance of the template. Whenever possible, keep statements that do not need to be repeated outside the LOOP tags.

## Tags That Manage Compositional and Approval Dependencies

For complete information about compositional and approval dependencies, see “About Dependencies” on page 470.

RENDER.LOGDEP (XML)	render:logdep (JSP)
<pre>&lt;RENDER.LOGDEP ASSET="asset name" CID="asset id" C="asset type"/&gt;</pre>	<pre>&lt;render:logdep asset="asset name" cid="asset id" c="asset type"/&gt;</pre>

Use the `RENDER.LOGDEP` tag if your template uses tags that obtain an asset's data without loading the asset, such as `ASSET.CHILDREN`.

**RENDER.UNKNOWNDEPS (XML)      render.unknowndeps (JSP)**`<RENDER.UNKNOWNDEPS />``<render:unknowndeps />`

Use the `RENDER.UNKNOWNDEPS` tag if a page has a query or some other indeterminate connection to its dependent assets. This tag causes the page or paglet to be regenerated at every publish because the dependencies cannot be determined. This means that you should use this tag sparingly.

**RENDER.FILTER (XML)****render:filter (JSP)**

```
<RENDER.FILTER LIST="list name"
LISTVARNAME="output list name"
LISTDICOL="assetID column"
[LISTTYPECOL="assettype column"]
[TYPE="asset type"]
[ID="asset id"]
[VARNAME="output variable"/>
```

```
<render:filter list="list name"
listvarname="output list name"
listidcol="assetID column"
[listtypecol="assettype
column"]
[type="asset type"]
[id="asset id"]
[varname="output variable"/>
```

Use the `RENDER.FILTER` tag to check for unapproved assets and prevent them from being included in the exported page. This tag filters either a single asset or list of assets by comparing each asset ID against the `assetid` column in the `ApprovedAssets` database table.

During export rendering, it filters what can be published based on approval status. During live rendering, `RENDER.FILTER` does nothing. Use this tag whenever you have a database query for a list of assets in your template.

## Tags That Retrieve Information About Basic Assets

**ASSET.LOAD (XML)****asset:load (JSP)**

```
<ASSET.LOAD
NAME="assetName"
TYPE="assetType"
OBJECTID="object.id"
[FIELD="fieldName"]
[VALUE="fieldValue"]
[DEPTYPE="EXACT, EXISTS,
or GREATER"] />
```

```
<asset:load
name="assetName"
type="assetType"
objectid="object.id"
[field="fieldName"]
[value="fieldValue"]
[deptype="exact,exists,or
greater"] />
```

This tag queries the database for a specific asset and then loads the asset's data into memory as an object. The object is then available to your elements until either the session is flushed or the name that is assigned to the object is overwritten.

The scope of the object names that you assign to loaded assets is **global**. Be sure to use unique object names so that your elements do not overwrite objects by mistake. A convenient naming convention is to include the element name in the asset name. For an example of creating unique asset object names by using this convention, see "Example 1: Basic Modular Design" on page 510.

ASSET.LOAD automatically logs a dependency between the template or element that uses the tag and the asset data that the tag retrieves.

ASSET.SCATTER (XML)	asset:scatter (JSP)
<ASSET.SCATTER	<asset:scatter
NAME="assetName"	name="assetName"
PREFIX="variablePrefix"/>	prefix="variablePrefix"/>

This tag retrieves values from all of the fields of an asset object that has already been retrieved (loaded) with the ASSET.LOAD tag and turns those values into Content Server variables. For example, if you want to display the headline, byline, description, and so on of an article online, you can use this tag to retrieve all of those values with one call.

ASSET.GET (XML)	asset:get (JSP)
<ASSET.GET	<asset:get
NAME="assetName"	name="assetName"
FIELD="fieldName"	field="fieldName"
[OUTPUT="outputVariable"]/>	[output="outputVariable"]/>

This tag retrieves the value from one specified field of an asset object that has already been retrieved (loaded) with the ASSET.LOAD tag and turns that value into a Content Server variable. For example, if you need only the headline of an article to use in a link to that article, you can use this tag to retrieve that one value.

ASSET.CHILDREN (XML)	asset:children (JSP)
<ASSET.CHILDREN	<asset:children
NAME="assetName"	name="assetName"
LIST="listName"	list="listName"
[CODE="NameOfAssociation"]	[code="NameOfAssociation"]
[OBJECTTYPE="typeOfObject"]	[objecttype="typeOfObject"]
[OBJECTID="objectID"]	[objectid="objectID"]
[ORDER="nrank"]/>	[order="nrank"]/>

This tag queries the AssetRelationTree table and then builds a list of assets that are children of the asset that you specified. You use this tag to retrieve assets in a collection, to retrieve the image assets associated with article assets, and so on.

Use the RENDER.LOGDEP tag in conjunction with ASSET.CHILDREN to log a dependency between the element or template in which it appears and the content that ASSET.CHILDREN retrieves.

## Performance Notes About the Asset Tags

- ASSET.LOAD and ASSET.CHILDREN are database queries, so you should use them only when necessary, because queries to the database take time. For example, you might want to include error checking code after an ASSET.LOAD tag and before its subsequent ASSET.CHILDREN tag that determines whether an asset was returned by the ASSET.LOAD. If there is no asset, there is no reason to invoke the ASSET.CHILDREN tag.

- An `ASSET . SCATTER` call takes much longer than a single `ASSET . GET` call.

## Tags That Create Assetsets (Flex Assets)

Assetset tags specify a set of one or more flex assets that you want to retrieve from the database.

You can retrieve the following information from an assetset:

- The values for one attribute for each of the flex assets in the assetset.
- The values for multiple attributes for each of the flex assets in the assetset.
- A list of the flex assets in the assetset
- A count of the flex assets in the assetset
- A list of unique attribute values for an attribute for all flex assets in the assetset
- A count of unique attribute values for an attribute for all flex assets in the assetset

The following tables describe the assetset tags that you will use most frequently.

ASSETSET.SETASSET (XML)	assetset:setasset (JSP)
<pre>&lt;ASSETSET . SETASSET   NAME="assetsetname"   TYPE="assettype"   ID="assetid"   [ LOCALE="localeobject" ]   [ DEPTYPE="exact exists none" ] /&gt;</pre>	<pre>&lt;assetset:setasset   name="assetsetname"   type="assettype" id="assetid"   [ locale="localeobject" ]   [ deptype="exact exists none" ] /&gt;</pre>

`ASSETSET . SETASSET` builds an asset set from a single asset that you specify and defines a compositional dependency between the template or element that it appears in and the content that it retrieves.

ASSETSET.SETSEARCHEDASSETS (XML)	assetset:setsearchedassets (JSP)
<pre>&lt;ASSETSET . SETSEARCHEDASSETS   NAME="assetsetname"   [ ASSETTYPES="assettype" ]   [ CONSTRAINT="searchstateobject" ]   [ LOCALE="localeobject" ]   [ SITE="siteidentifier" ]   [ DEPTYPE="exact exists none" ] /&gt;</pre>	<pre>&lt;assetset:setsearchedassets   name="assetsetname"   [ assettypes="assettype" ]   [ constraint="searchstateobject" ]   locale="localeobject" ]   site="siteidentifier" ]   [ deptype="exact exists none" ] /&gt;</pre>

`ASSETSET . SETSEARCHEDASSETS` creates an assetset object which represents all assets of specific types narrowed by specified search criteria (represented by the `searchstate` object that you name in the `constraint` parameter).

This tag also defines a compositional dependency between the template or element in which it appears and the each asset in the set.

ASSETSET.GETMULTIPLEVALUES (XML)	assetset:getmultiplevalues (JSP)
----------------------------------	----------------------------------

<pre>&lt;ASSETSET.GETMULTIPLEVALUES   NAME="assetsetname"   LIST="listname"   [BYASSET="true false"]   PREFIX="prefix"/&gt;</pre>	<pre>&lt;assetset:getmultiplevalues   name="assetsetname"   list="listname"   [byasset="true false"]   prefix="prefix"/&gt;</pre>
---	---

ASSETSET.GETMULTIPLEVALUES scatters attribute values from several attributes (and potentially more than one asset) into several specified lists.

FatWire recommends using ASSETSET.GETMULTIPLEVALUES when the goal is to display a fixed-format table of assets, or to obtain many attributes of a single asset (such as for a product detail page).

ASSETSET.GETMULTIPLEVALUES has the following limitations:

- Only non-foreign attributes can be scattered.
- Text-type attributes cannot be scattered.

ASSETSET.GETATTRIBUTEVALUES (XML)	assetset:getattributevalues (JSP)
-----------------------------------	-----------------------------------

<pre>&lt;ASSETSET.GETATTRIBUTEVALUES   NAME="assetsetname"   ATTRIBUTE="attribname"   [TYPENAME="assettypename"]   LISTVARIABLE="varname"    [ORDERING="ascending descending"] /&gt;</pre>	<pre>&lt;assetset:getattributevalues   name="assetsetname"   attribute="attribname"   [typename="assettypename"]   listvarname="varname"    [ordering="ascending descending"] /&gt;</pre>
--	---

ASSETSET.GETATTRIBUTEVALUES gets the list of values for a specified attribute of the assets represented by an assetset.

ASSETSET.GETASSETLIST (XML)	assetset:getassetlist (JSP)
-----------------------------	-----------------------------

<pre>&lt;ASSETSET.GETASSETLIST   NAME="assetsetname"   [LIST="attriblist"]   [MAXCOUNT="rowcount"]   [METHOD="random highest"]   LISTVARIABLE="varname"/&gt;</pre>	<pre>&lt;assetset:getassetlist   name="assetsetname"   [list="attriblist"]   [maxcount="rowcount"]   [method="random highest"]   listvarname="varname"/&gt;</pre>
--	---

ASSETSET.GETASSETLIST retrieves an ordered list of assets, given optional sort criteria. The resulting list has two columns, `assetid` and `assettype`, that are sorted by the criteria that you specify.



## Tags That Create Searchstates (Flex Assets)

Searchstate tags assemble criteria that filter the assets that you retrieve using the `assetset` tags.

You build a searchstate by adding or removing constraints to narrow or broaden the list of flex assets that are described by the searchstate.

The following tables describe the `searchstate` tags that you will use most frequently.

SEARCHSTATE.CREATE (XML)	searchstate:create (JSP)
<pre>&lt;SEARCHSTATE.CREATE   NAME="ssname"   [OP="and or"] /&gt;</pre>	<pre>&lt;searchstate:create   name="ssname"   [op="and or"] /&gt;</pre>

`SEARCHSTATE.CREATE` builds an empty searchstate object. You must begin constructing a searchstate with this tag.

SEARCHSTATE.ADDSTANDARDCONSTRAINT (XML)	searchstate:addstandardconstraint (JSP)
<pre>&lt;SEARCHSTATE.ADDSTANDARDCONSTRAINT   NAME="ssname"   [BUCKET="bucketname"]   [TYPENAME="assettype"]   ATTRIBUTE="attribname"   [LIST="listname"]   [IMMEDIATEONLY="true false"]   [CASEINSENSITIVE="true false"] /&gt;</pre>	<pre>&lt;searchstate:addstandardconstraint   name="ssname"   [bucket="bucketname"]   [typename="assettype"]   attribute="attribname"   [list="listname"]   [immediateonly="true false"]   [caseinsensitive="true false"]   /&gt;</pre>

`SEARCHSTATE.ADDSTANDARDCONSTRAINT` adds an attribute name/value constraint into a new or existing searchstate object.

You can constrain the attribute by a list of values that you specify in the `list` parameter.

SEARCHSTATE.ADDSIMPLESTANDARDCONSTRAINT (XML)	searchstate:addsimplestandardconstraint (JSP)
<pre>&lt;SEARCHSTATE.ADDSIMPLESTANDARDCONSTRAINT   NAME="ssname"   [BUCKET="bucketname"]   [TYPENAME="assettype"]   ATTRIBUTE="attribname"   VALUE="value"   [IMMEDIATEONLY="true false"] /&gt;</pre>	<pre>&lt;searchstate:addsimplestandardconstraint   name="ssname"   [bucket="bucketname"]   [typename="assettype"]   attribute="attribname"   value="value"   [immediateonly="value"] /&gt;</pre>

`SEARCHSTATE.ADDSIMPLESTANDARDCONSTRAINT` adds an attribute name/single value constraint to an existing searchstate.

This tag is the simple version of `SEARCHSTATE.ADDSTANDARDCONSTRAINT`. The object referred to by `NAME` is updated to reflect the new constraint. If the attribute name is already in the searchstate, then the new constraint replaces the old constraint.

SEARCHSTATE.ADDRANGECONSTRAINT (XML)	searchstate:addrangeconstraint (JSP)
<pre>&lt;SEARCHSTATE.ADDRANGECONSTRAINT   NAME="ssname"   [ BUCKET="bucketname" ]   [ TYPENAME="assettype" ]   ATTRIBUTE="attribname"   LOWER="lowrange"   UPPER="uprange"   [ CASEINSENSITIVE="true false" ] /&gt;</pre>	<pre>&lt;searchstate:addrangeconstraint   name="ssname"   [ bucket="bucketname" ]   [ typename="assettype" ]   attribute="attribname"   lower="lowrange"   upper="uprange"   [ caseinsensitive="true false" ]  /&gt;</pre>

SEARCHSTATE.ADDRANGECONSTRAINT adds a range constraint for a specific attribute name.

SEARCHSTATE.ADDRICHTEXTCONSTRAINT (XML)	searchstate:addrichtextconstraint (JSP)
<pre>&lt;SEARCHSTATE.ADDRICHTEXTCONSTRAINT   NAME="ssname"   [ BUCKET="bucketname" ]   [ TYPENAME="assettype" ]   ATTRIBUTE="attribname"   VALUE="criteria"   [ PARSER="parsername" ]   CONFIDENCE="minlevel"   [ MAXCOUNT="number" ] /&gt;</pre>	<pre>&lt;searchstate:addrangeconstraint   name="ssname"   [ bucket="bucketname" ]   [ typename="assettype" ]   attribute="attribname"   lower="lowrange"   upper="uprange"   [ caseinsensitive="true false" ]  /&gt;</pre>

SEARCHSTATE.ADDRICHTEXTCONSTRAINT adds an attribute name and rich-text expression to the list of rich-text constraints in the searchstate.

SEARCHSTATE.TOSTRING (XML)	searchstate:tostring (JSP)
<pre>&lt;SEARCHSTATE.TOSTRING   NAME="objname"   VARNAME="varname" /&gt;</pre>	<pre>&lt;searchstate:tostring   name="objname"   varname="varname" /&gt;</pre>

SEARCHSTATE.TOSTRING converts a searchstate object into its string representation that is suitable for various uses, such as saving in a session variable or packing into a URL.

SEARCHSTATE.FROMSTRING (XML)	searchstate:fromstring (JSP)
<pre>&lt;SEARCHSTATE.FROMSTRING   NAME="objname"   VALUE="stringval" /&gt;</pre>	<pre>&lt;searchstate:fromstring   name="objname"   value="stringval" /&gt;</pre>

SEARCHSTATE.FROMSTRING provides the ability for a searchstate object to be initialized from its string representation.

You must create an empty searchstate using the `SEARCHSTATE.CREATE` tag before you can use this tag.

## Variables

CSEE supports the following kinds of variables:

- Regular variables, which last for the duration of the current template or element, unless you explicitly remove them. Regular variables have a global scope.
- Session variables, which last for the duration of the current session.

CSEE provides several standard variables whose names are reserved. You can retrieve the values of these variables, but you cannot use their names for other variables that you create.

This section describes the following topics:

- Reserved Variables
- PageCriteria Variables
- Setting Regular Variables
- Setting Session Variables
- Working With Variables
- Variables and Precedence
- Best Practices with Variables

## Reserved Variables

The following table defines the standard CSEE variables. Unless otherwise noted, these are regular variables:

Variable	Definition
tablename	A variable that is set to a tablename before the <code>execsql</code> tags can be run.
pagename	The name of the Content Server page being invoked.
ftcmd	A variable used in calls to <code>CatalogManager</code> .
username	A session variable that contains the name of the user who is currently logged in to the current session.
password	A session variable that contains the password of the user who is currently logged in to the current session.
authusername	A variable that you can set to the username of a user who you want to log in to Content Server. This can be sent to Content Server via a URL.
authpassword	A variable that you can set to the password of a user who you want to log in to Content Server. This can be sent to Content Server via a URL.

Variable	Definition
<code>currentACL</code>	A session variable that contains the ACLs that the current user belongs to.
<code>errno</code>	Error numbers reported by CSEE tags.
<code>c</code>	The asset type that a template formats. CS-Direct sets this variable by default when you save the template asset.
<code>cid</code>	The ID of the asset being rendered or formatted by a template.
<code>ct</code>	The value of a child template, if there is one. For a thorough explanation of child templates, see “Example 3: Using the <code>ct</code> Variable” on page 518.
<code>p</code>	The ID of an asset's parent page, if there is one.
<code>rendermode</code>	Specifies whether a page entry is to be delivered live, exported, or previewed. By default, <code>rendermode</code> is <code>live</code> . When you Export to Disk, or use the Preview function, CS-Direct automatically overrides the value of this variable with <code>export</code> or <code>preview</code> . This value is used internally and must not be modified.
<code>seid</code>	The ID of a SiteEntry asset.
<code>tid</code>	The ID of a template asset.
<code>eid</code>	The ID of a CSElement asset, <code>eid</code> is available to the the CSElement's root element.

## PageCriteria Variables

CSEE's caching mechanism uses variables to help identify different pages in the cache. The term **PageCriteria** designates variables that are used to identify cached pages, which means that the variables are used in the page's cache key.

In order for CSEE to cache and retrieve your web pages properly, you must log any variable that meets the following criteria as a PageCriteria variable:

- The variable affects the rendered page. For example, if your page uses a `color` variable that sets the background color, you must set that variable as PageCriteria.
- You pass the variable from one page to another.

You specify PageCriteria variables in the `resargs` fields of the page's SiteCatalog entry. Variables which meet the preceeding criteria but are not specified as PageCriteria will generate an error.

When you save a template asset, the CSEE Content Applications set the following variables as PageCriteria by default:

- `c`
- `cid`
- `p`
- `rendermode`

For complete information about CSEE caching and PageCriteria, see “PageCriteria and the Cache Key” on page 104.

## Setting Regular Variables

Most of the variables that you will use while coding CSEE templates and elements are **regular variables**. Regular variables last for the duration of the current template or element, unless they are explicitly deleted using CSEE tags.

## Setting Variables with SETVAR

Inside a CSEE element, you can call the SETVAR XML or JSP tags to create a variable and establish its initial value. For example, the following SETVAR XML tag creates a variable named `dog` and sets its value to `fido`:

```
<SETVAR NAME="dog" VALUE="fido" />
```

If the variable already exists, SETVAR resets its value to the new value. For example, the following command resets the value of `dog` to `mocha`:

```
<SETVAR NAME="dog" VALUE="mocha" />
```

## Setting Variables via a URL

CSEE creates a page when a browser goes to a URL managed by a CSEE application. Each page is associated with a particular URL. Imagine, for example, a page associated with a URL having the following format:

```
http://host:port/servlet/ContentServer?pagename=Experiment/Hello
```

At the end of every URL, you can set one or more variables. For example, the following URL creates three variables in the `Hello` page:

```
http://host:port/servlet/ContentServer?pagename=Experiment/Hello&dog=fido&cat=fifi
```

The preceding URL creates the following variables available to `Hello`:

- A variable named `pagename` whose value is `Experiment/Hello`
- A variable named `dog` whose initial value is `fido`.
- A variable named `cat` whose initial value is `fifi`.

## Setting Default Variables for Elements and Templates with Content Server Explorer

You can use Content Server Explorer to create default variables in a page by placing the variables in either of the following fields:

- `resargs1` or `resargs2` fields of the `SiteCatalog` database table
- `resdetails1` or `resdetails2` fields of the `ElementCatalog` database table

For example, you can use Content Server Explorer to access the `SiteCatalog` table, and then create variables `dog` and `cat` by placing name/value pairs in the `resargs1` and `resargs2` fields:

pagename	rootelement	csstatus	resargs1	resargs2	cacheinfo	acl
* Hello	Experiment/Hello	Live	dog=fido	cat=fifi		

Note that we placed one name/value pair in `resargs1` and another in `resargs2`. Alternatively, we could have put both name/value pairs in `resargs1`, as shown in the following diagram:

pagename	rootelement	csstatus	resargs1	resargs2	cacheinfo	acl
* Hello	Experiment/Hello	Live	dog=fido & cat=fifi			

You can also set the values of `dog` and `cat` in the `ElementCatalog` table by putting name/value pairs in the `resdetails1` and `resdetails2` fields:

elementname	description	url	resdetails1	resdetails2
* Hello		Experiment\Hello.xml	dog=fido	cat=fifi

Variables set through the URL or through POST and GET operations take precedence over variables set using the `SiteCatalog` or `ElementCatalog` tables. For example, if a URL sets variable `dog` to `rex` and the `SiteCatalog` sets `dog` to `fido`, then the resulting value of `dog` will be `rex`.

## Setting Variables Using HTML Forms

In CGI programming, a buyer fills out a form. Then, the browser encodes the buyer's responses as name/value pairs, which get passed to the CGI script.

Although CSEE does not use traditional CGI programming, a CSEE element can still display a form. As in traditional programming, the browser encodes the buyer's responses as name/value pairs. However, instead of passing these name/value pairs to a CGI program, the pairs get passed to a different CSEE page. The receiving CSEE page can access the name/value pairs as it would access any Content Server variable.

Cookie names and values are also instantiated as variables. For more information about cookies, see Chapter 6, "Sessions and Cookies."

## Setting Session Variables

HTTP is a stateless protocol. To overcome this limitation, CSEE can maintain state between requests and, thus, keep track of sessions.

A browser connection to the CSEE system establishes a session. Thereafter, the session is uniquely identified to the system. CSEE can deliver pages whose content and behavior are based on this unique identity.

When a client first enters your site, a unique session is established. CSEE associates a default user identity with a new session and maintains that information in session variables. **Session variables** contain values that are available for the duration of the session. They are saved as part of the user's session and are used to retain the value of a variable across page requests.

In a clustered configuration, the session state is maintained across all cluster members. Session variables should be used carefully, since there is a resource cost that is proportionate to the number and size of session variables used.

Session state is lost under these conditions:

- The client exits.
- The session has timed out. Content Server can optionally terminate a session if no requests have been made for some period of time.
- The application server has been restarted.

Server resources associated with the session are deallocated when the following occurs:

- The session has been explicitly terminated by the client via a CSEE tag.
- The session has timed out.
- The application server has been restarted.

Use the `SETSSVAR` XML and JSP tags to create a session variable. If the session variable already exists, `SETSSVAR` resets the variable's value. For example, the following `SETSSVAR` XML tag sets the session variable `profile` to the value `10154`:

```
<SETSSVAR NAME="profile" VALUE="10154"/>
```

## Working With Variables

The following sections describe how to work with Content Server variables.

### Retrieving a Variable's Value

The syntax you use to read the value of a variable depends on the kind of variable:

Type of Variable	Syntax	Example
String Variable	<code>Variables.variable_name</code>	<code>Variables.dog</code>
Counter Variable	<code>Counters.variable_name</code>	<code>Counters.position</code>
Session Variables	<code>SessionVariables.variable_name</code>	<code>SessionVariables.username</code>
Property	<code>CS.Property.property_name</code>	<code>CS.Property.verity.path</code>

CSEE XML provides quite a few methods for accessing list variables.

### Displaying a Variable's Value

Use the `CSVAR` XML tag to display the value of any kind of variable, including properties and session variables. Use the `ics:getvar` JSP tag to view the value of a regular CSEE variable; or the `ics:getssvar` JSP tag to display the value of a session variable. For example, if the following code appears in an XML element:

```
<SETVAR NAME="mood" VALUE="happy"/>
<p>My dog is <CSVAR NAME="Variables.mood"/>.</p>
```

then the resulting page displays the following text:

My dog is happy.

You can also include literal values as part of the `NAME` argument to the `CSVAR` XML tag; for example, the following code will also generate “My dog is happy.”, but evaluates more slowly:

```
<SETVAR NAME="mood" VALUE="happy"/>
<p><CSVAR NAME="My dog is Variables.mood"/>.</p>
```

## Assigning One Variable Value to Another Variable

You can assign the value of one variable to another variable. You accomplish this task differently if you are coding with XML than if you are coding with JSP.

### JSP

If you are coding with JSP, you cannot use the `ics:getvar` tag to evaluate the variable value because you cannot nest one JSP tag within another JSP tag. To circumvent this limitation, use the `ics.GetVar` Java method to substitute variable values, as shown in the following sample code:

```
<ics:setvar name="myVar" value="Fred"/>
<ics:setvar name="yourVar" value='<%=ics.GetVar("myVar")%>' />
<ics:getvar name="yourVar" />
```

### Note

You must enclose the expression that evaluates the variable value (`'<%=ics.GetVar("myVar")%>'` in the example) in single quotes. Otherwise your JSP element will throw an exception.

### XML

The following lines of XML assign the value `carambola` to a variable named `your_favorite`:

```
<SETVAR NAME="my_favorite" VALUE="carambola"/>
<SETVAR NAME="your_favorite" VALUE="Variables.my_favorite"/>
```

Taking this one step further, you can concatenate two variable values and assign the result to a third variable. For example, the following sets the variable `car` to the value `red rabbit`.

```
<SETVAR NAME="color" VALUE="red"/>
<SETVAR NAME="model" VALUE="rabbit"/>
<SETVAR NAME="car" VALUE="Variables.color Variables.model"/>
```

## Using Variables in HTML Tags

You can use XML and JSP variables within traditional HTML tags, although you code differently to accomplish this in XML and JSP.

### JSP

If you are coding with JSP, you use the `ics:getvar` tag or the `ics.GetVar` Java method to evaluate the variable value.

You can also use the `ics.resolvevariables` tag to resolve variables that are contained within a string. For example, the following code displays the phrase "The date is," along with the value of the `CS.Date` variable:

```
<ics.resolvevariables name="The date is $(CS.Date)."
delimited="true"/>
```



The `delimited` parameter indicates that you have used the delimiters `$(` and `)` to explicitly mark the variable or variables that you want to resolve. If you want to use variables to specify a list name and a column in that list, for example, you use the following syntax:

```
<ics.resolvevariables
name="$(Variables.listname).$(Variables.columnname)"
delimited="true"/>
```

If the `delimited` parameter is set to `false`, no delimiters are used to set off variables.

## XML

You can use XML variables inside HTML tags if you use the appropriate attributes. For example, the following code does not contain the appropriate attributes and, therefore, does not set the background color to red:

```
<SETVAR NAME="color" VALUE="red"/>
<TABLE bgcolor="Variables.color">
...
```

To use XML variable values within an HTML tag, you must use the `REPLACEALL` attribute within that HTML tag. The `REPLACEALL` attribute tells the system to substitute the current value of this XML variable within this HTML tag. Therefore, the correct way to code the preceding lines is as follows:

```
<SETVAR NAME="color" VALUE="red"/>
<TABLE bgcolor="Variables.color" REPLACEALL="Variables.color">
...
```

You can combine multiple variable values within one `REPLACEALL` attribute. For example, the following HTML `TABLE` tag uses two XML variables:

```
<SETVAR NAME="color" VALUE="red"/>
<SETVAR NAME="myborder" VALUE="3"/>
<TABLE bgcolor="Variables.color" border="Variables.myborder"
  REPLACEALL="Variables.color,Variables.myborder">
...
```

The `<REPLACEALL>` tag is an alternative to the `REPLACEALL` attribute. The `<REPLACEALL>` tag performs substitutions within its domain; for example:

```
<SETVAR NAME="highlight" VALUE="red"/>
<SETVAR NAME="diminish" VALUE="gray"/>
<REPLACEALL LIST="Variables.highlight,Variables.diminish">
<TABLE>
  <TR BGCOLOR="Variables.highlight"><TD>Diamonds</TD></TR>
  <TR BGCOLOR="Variables.highlight"><TD>Pearls</TD></TR>
  <TR><TD>Malachite</TD></TR>
  <TR BGCOLOR="Variables.diminish"><TD>Coal</TD></TR>
</TABLE>
</REPLACEALL>
```

The output of this section is:

Diamonds

Pearls

Malachite

Coal

The `REPLACEALL` tag performs a string search and replace, and is, therefore, potentially very slow. Use the `REPLACEALL` attribute where possible. If you must use the `REPLACEALL` tag, keep the amount of code you enclose with it as small as possible.

## Evaluating Variables with IF/THEN/ELSE

CSEE XML and JSP provides the `IF/THEN/ELSE` construct available in most computer languages. However, the only conditional operation for variables is to compare two values for equality or inequality. You can't, for example, compare two values to see if one is greater than another. (You can write Java code to do that, however.)

For example, the following code branches depending on the value of a variable named `greeting`.

```
<IF COND="Variables.greeting=Hello">
<THEN>
    <p>Welcome.</p>
</THEN>
<ELSE>
    <p>So long.</p>
</ELSE>
</IF>
```

If `greeting` is set to `Hello`, then CSEE generates the HTML:

```
<p>Welcome.</p>
```

If `greeting` is set to anything other than `Hello`, CSEE generates:

```
<p>So long.</p>
```

## Variables and Precedence

Variables set through a URL or through HTTP GET and POST operations take precedence over variables set with the `resargs` and `resdetails` columns in the `SiteCatalog` and `ElementCatalog` tables.

## Best Practices with Variables

Because all variables are global and the syntax for accessing variables from items in lists and from other sources is the same, good coding practices help you to avoid errors. For example:

- Because it is easy to reuse base names in your elements, use prefixes in front of variables to define them uniquely. The recommended syntax to use is:  
`Variables.assettype:fieldname.`

For example, `Variables.Article:description.`

The `ASSET.SCATTER` tag makes it easy for you to use this syntax through its `PREFIX` attribute. (For more information about this tag, see Chapter 21, “Coding Elements for Templates and CSElements.”)

- If you are going to use the `RESOLVEVARIABLES` tags to resolve your variables, set the `DELIMITED` parameter to `true` and use the delimiters `$ (` and `)` to explicitly indicate the variables you want to resolve.
- Use debugging to catch naming conflicts. Use the Property Editor to set the `ft.debug` property in the `futuretense.ini` file to “yes” (`ft.debug=yes`). When this setting is enabled, CS-Direct writes a record of all the variables that are created to the `futuretense.txt` log. For more help with debugging, use the XML Page Debugger utility.

For a list of the error values that Content Server and CS-Direct tags can write to the `errno` variable, see the *CSEE Developer’s Tag Reference*.

## Other CSEE Storage Constructs

In addition to regular and session variables, CSEE supports a number of storage constructs. The following sections describe these constructs and how to use them:

- Built-ins
- Lists
- Counters

### Built-ins

CSEE provides several built-ins, which return values such as the current date.

The general syntax of a built-in is:

```
CS.builtin
```

For example, `UniqueID` is a built-in that generates a unique ID. The following syntax generates or references this built-in variable:

```
CS.UniqueID
```

For a list of built-ins in CSEE, see the *CSEE Developer’s Tag Reference*.

### Lists

A list consists of a table of values organized in rows and columns. Use the `SETROW` or `GOTOROW` tags to identity the proper row.

The following entities create lists:

- The `SELECTTO`, `EXECSQL`, `CATALOGDEF`, `STRINGLIST` and `CALLSQL` tags
- `CatalogManager` commands
- `TreeManager` commands
- Custom tags

Use the following syntax to refer to a current row’s column value:

```
listname.colname
```

For example, if a list named `cars` had a column named `color`, the value of the current row would be referenced as:

```
cars.color
```

## Looping Through Lists

Use the `LOOP XML` tag or the `ics:listloop` JSP tag to iterate through a list. For each row in the list, CSEE executes the instructions between the loop tags.

For example, consider a table named `MyCars` containing the following rows:

id	Model	Color	Year
224	Ford Focus	blue	2001
358	VW Rabbit	red	1998
359	Toyota Corolla	yellow	2000
372	Alpha Romeo Spider	red	1982
401	Porsche 911	red	1984
423	Dodge Voyager	tan	1991

The following XML searches `MyCars` for red cars. The `SELECTTO XML` and JSP tags write this information into a list variable named `carlist`.

```
<SETVAR NAME="color" VALUE="red"/>
<SELECTTO FROM="MyCars" WHERE="color" WHAT="*" LIST="carlist"/>
Red cars: <BR/>
<OL>
<LOOP LIST="carlist">
  <LI><CSVAR NAME="carlist.model"/> </LI>
</LOOP>
</OL>
```

The preceding XML generates the following HTML:

```
Red cars: <BR/>
<OL>
  <LI> VW Rabbit </LI>
  <LI> Alpha Romeo Spider </LI>
  <LI> Porsche 911 </LI>
</OL>
```

## Counters

A counter is an XML variable whose value is an integer. Three tags control counters:

Tag	What It Does
SETCOUNTER	Initializes a counter variable
INCCOUNTER	Changes the counter's value by a specified amount

Tag	What It Does
REMOVECOUNTER	Destroys the counter variable

To create a counter, you call `SETCOUNTER`. To change its value, call `INCCOUNTER`. For example, consider the following code:

```
<SETCOUNTER NAME="c" VALUE="10" />
<INCCOUNTER NAME="c" VALUE="3" />
<p>Current value is <CSVAR NAME="Counters.c" /></p>
```

The output of this code is:

```
Current value is 13
```

Notice that you reference counter variables using the syntax:

```
Counters.name
```

## Values for Special Characters

If you need to use special (non-alphanumeric) characters in your XML or JSP, you will need to use their hexadecimal character representation. For example, the following line specifies a space as part of a variable value:

```
<SETVAR NAME="foo" VALUE="foo%20bar" />
```

The following are hexadecimal values for special characters that are commonly used in CSEE:

Hexadecimal Value	Character
%22	doublequote (")
%20	one space
%3c	less than sign (<)
%3e	greater than sign (>)
%26	ampersand (&)
%09	tab (\t)
%0a	newline (\n)
%0d	carriage return (\r)
%25	percent (%)



## Chapter 4

# Page Design and Caching

Caching your web pages can improve your site's performance. Whether your site is static or dynamic, you need to design your site so that part or all of a given page is cached. This chapter describes how Content Server Enterprise Edition (CSEE) caching works, and includes the following sections:

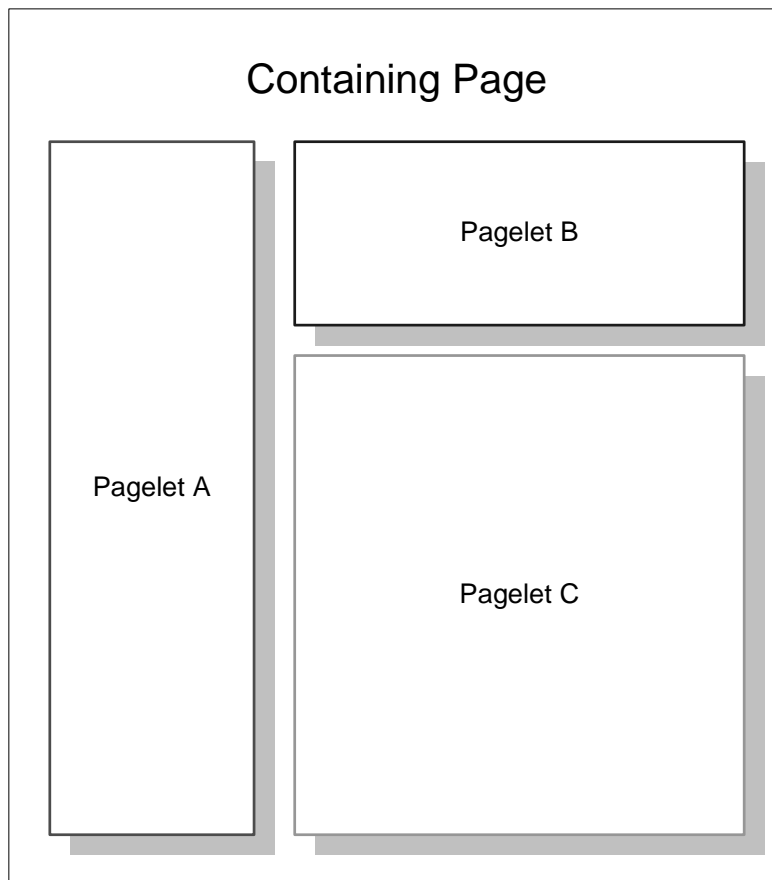
- Modular Page Design
- CSEE Caching
- Viewing the Contents of the CS-Satellite Cache
- Double-Buffered Caching
- Caching and Security

## Modular Page Design

FatWire recommends that you design your web pages using a modular page design strategy, where a web page that a web site visitor sees is composed of multiple elements. Modular page design has several benefits:

- It improves system performance by allowing you to develop an efficient caching strategy
- It allows you to code common design elements, like navigation bars, one time and use them on multiple web pages

The following diagram shows a simple modular page:



**Figure 1:** A modular page

Each rectangle in Figure 5 represents a pagelet—the generated output of one or more elements. These pagelets are called by a containing page. The containing page lays out how the pagelets appear on the finished page and contains any code that must be evaluated each time the page is viewed—custom ACL checking code, for example. This strategy allows you to code an element once and use it in many places in your web site.

## CSEE Caching

CSEE allows you to cache entire web pages and/or the components that make up those web pages. An efficient page caching strategy improves system performance by reducing load on Content Server.

Two members of the CSEE product family implement page caching:

- Content Server, which caches pages on the Content Server system
- CS-Satellite, which provides a second level of caching for your Content Server system, and can also be used as a remote cache for your web pages



CSEE utilizes both the Content Server and CS-Satellite caches to create an efficient caching strategy.

## Content Server Caching

Pagelets generated by requests to the ContentServer servlet can be cached on disk. If a page is accessed frequently and its content depends on a small number of parameters, then it is a good candidate for disk caching.

To disk cache a pagelet, you use one of the following tags:

Product	JSP Tag	XML Tag
Content Server	<code>satellite:page</code>	<code>SATELLITE.PAGE</code>
Content Server Direct	<code>render:satellitepage</code>	<code>RENDER.SATELLITEPAGE</code>

If the pagelet that you want to cache is not already in the disk cache, ContentServer adds it to the cache and then serves the pagelet. If the specified pagelet is already in the disk cache, ContentServer simply serves it.

Disk-cached pagelets have time-based expiration governed by properties in the `futuretense.ini` file, in conjunction with the values set in the `cacheinfo` column of the `SiteCatalog` table. Items in cache are bound by the same security rules as uncached pages; Content Server ACLs apply to cached pagelets just as they do to elements.

## BlobServer and Caching

The term **blob** is an acronym for binary large object. Although a blob is usually an image file, a blob can be any binary object, including a Microsoft Word file or a spreadsheet. Most web sites serve a number of blobs.

To serve blobs, Content Server offers a special servlet called BlobServer. The BlobServer gathers a blob from a table and performs all relevant security checks.

You access BlobServer with the BlobServer tags:

- For Content Server systems: `satellite:blob`
- For CS-Direct systems: `render:satelliteblob`

Both of these tags cache blobs in the Content Server and CS-Satellite caches. For more information about the BlobServer tags, see the *CSEE Developer's Tag Reference*.

### Deleting Blobs from the Content Server Memory Cache

To delete a specific blob from the Content Server cache, replace the `blobtable` parameter name in the BlobServer URL with `flushblobtable`, as shown in the following BlobServer URL:

```
http://hostname:port/servlet/BlobServer?blobcol=urlbody
&blobheader=text%2Fcss&blobkey=name&flushblobtable=StyleSheet
&blobwhere=BF-MSIE-Win
```

To delete **all** blobs from the Content Server cache, replace the `blobtable` parameter name and value with `flushblobtable=true`.

## CS-Satellite Caching

CS-Satellite provides an additional layer of caching for your CSEE system. It is automatically installed on your Content Server box. To improve your CSEE system's performance, you can add remote CS-Satellite systems, putting your content closer to its intended audience.

CS-Satellite caches pages, pagelets, and blobs to disk or to memory. You can use the Inventory servlet to view the contents of the memory and disk caches in varying degrees of detail. Note that items cached on CS-Satellite are not protected by Content Server APIs. You can overcome this limitation by using the caching strategy outlined in "Pagelet Caching Strategies" on page 112.

CS-Satellite caches small items to memory and large items to disk. You control the definitions of small and large through the `file_size` property. For more information on setting CS-Satellite properties, see the *CSEE Administrator's Guide*.

On a busy site, each CS-Satellite system's cache fills up quickly with the most popular pages. When the cache is full, CS-Satellite deletes old pages to make room for new ones. CS-Satellite uses a Least Recently Used algorithm (LRU) to determine items which should be removed from the cache. In other words, when a new page needs to be cached, CS-Satellite removes the page that hasn't been accessed for the longest time. For example, given two cached pages—one that hasn't been accessed in 36 hours and the other that hasn't been accessed in 2 hours—CS-Satellite removes the page that hasn't been accessed in 36 hours.

## Cache Expiration

When you configure CS-Satellite, you use the `expiration` property to set a default cache expiration time for both pages and pagelets. The default expiration time cannot be changed on a page-by-page basis if you are using the FileServer servlet to cache at the page level.

If you are using the Satellite servlet to cache at the pagelet level, cache expiration is set differently for pages which are called using URLs, like containing pages, than for pagelets, which are called using Satellite tags.

The expiration for pages called by URLs is set using the `expiration` property, described in "CS-Satellite Properties" on page 106. Their expiration time cannot be overridden using Satellite tags, as can be done with pagelets.

The expiration for pagelets can be set in one of three ways:

- Use CS-Satellite tags to override the default expiration time on a pagelet-by-pagelet basis.
- If there is no Satellite tag to override the default expiration, CS-Satellite gets the expiration time from the value of the `satellite.page.cachecontrol.default` property. This property is described in "futuretense.ini Properties" on page 106.
- If the `satellite.page.cachecontrol.default` property has no value set, CS-Satellite gets the expiration time from the value of the `expiration` property, described in "CS-Satellite Properties" on page 106.

Blobs cached on CS-Satellite expire using an algorithm similar to that for page and pagelet expiration:

- You can use CS-Satellite tags to override the default expiration time on a blob-by-blob basis.

- If there is no Satellite tag to override the default expiration, CS-Satellite gets the expiration time from the value of the `satellite.blob.cachecontrol.default` property. This property is described in “futuretense.ini Properties” on page 106.
- If the `satellite.blob.cachecontrol.default` property has no value set, CS-Satellite gets the expiration time from the value of the `expiration` property, described in “CS-Satellite Properties” on page 106.

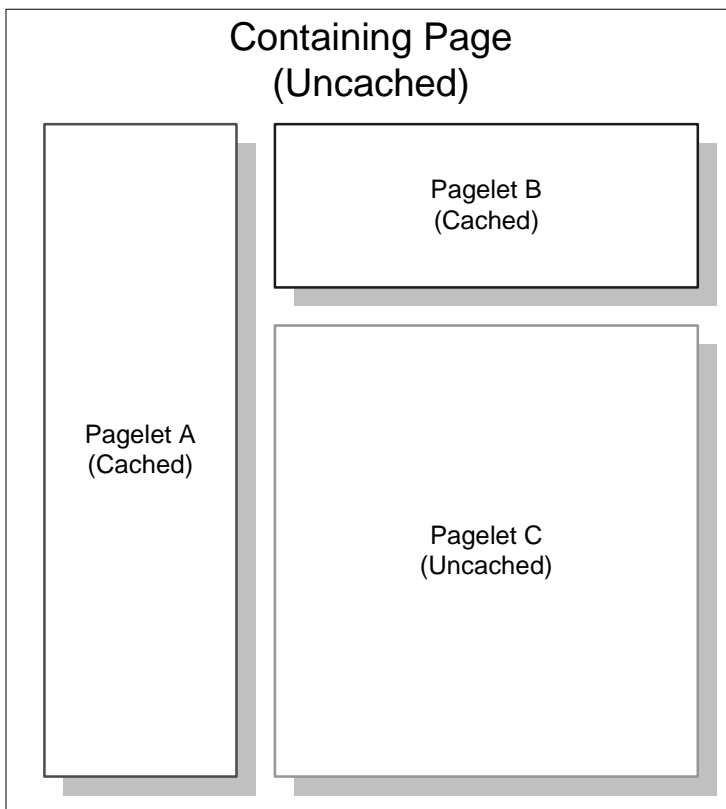
## Caching with the Satellite Servlet

The following sections describe how the Satellite servlet caches web pages and how you can implement CS-Satellite caching on your site. Use caching with the Satellite servlet in tandem with modular page design to create a fast, efficient web site.

### How the Satellite Servlet Caches Pages

The Satellite servlet allows caching at the pagelet level, and can provide even better performance than FileServer. To implement caching with the Satellite servlet, you use CS-Satellite XML or JSP tags in your Content Server pages, and you access pages using special Satellite URLs.

For example, suppose that you used the Satellite servlet to implement pagelet-level caching on a web page named `myPage`. `myPage`, shown in Figure 3, is composed of a containing page and three pagelets: A, B, and C. The containing page and pagelets A and B are already cached on a CS-Satellite system, but pagelet C is not cached.



When a user requests `myPage`:

1. CS-Satellite examines the URL. If it is a Satellite URL, the Satellite servlet gets the cached copy of the containing page. The servlet then looks for pointers to pagelets which are not currently in its cache, and requests those pagelets from Content Server. So, in our example, the Satellite servlet gets the containing page, and gets pagelets A and B from its cache.
2. The Satellite servlet requests Pagelet C from Content Server.
3. Content Server parses the appropriate XML to create Pagelet C and sends it to the Satellite servlet.
4. The Satellite servlet assembles Pagelets A, B, and C into the page, and sends the assembled page to the requester. The servlet also caches Pagelet C.

### Implementing Caching with the Satellite Servlet

To implement pagelet-level caching with the Satellite servlet, you add Satellite tags to your Content Server templates. You do not develop any XML, JSP, or Java code on CS-Satellite systems. In fact, CS-Satellite does not know how to parse XML.

The Satellite tags in your elements are interpreted by the Java code you installed as part of CS-Satellite. If this code is being called with a Satellite URL, it generates the information that the Satellite servlet uses to cache and construct the pagelets. If you do not call an element containing Satellite tags with a Satellite URL, the resulting page functions as if the Satellite tags were Content Server tags.

Satellite URLs look like the following example:

```
http://host_name:port/servlet/Satellite?pagename=page
```

where *host\_name* and *port* are the hostname and port number of your CS-Satellite machine, and *page* is the name of the page you are requesting. A Satellite URL can also include name/value pairs you want to pass to the called page.

### Caching a Pagelet

The following sample code uses the `satellite:page` tag to call a pagelet. If the pagelet is not already in CS-Satellite's cache, the Satellite servlet loads and caches the page. If the pagelet encounters an error during processing and cannot be evaluated, it is not cached.

The `satellite.page` tag identifies a cached pagelet by the `pagename` and the name/value pairs passed to it. If the parameters or the name/value pairs differ from one invocation to another, a different pagelet will be cached even if the content generated is the same. It is important to use name/value pairs to pass arguments to a pagelet through a `satellite.page` tag. Values passed through the session may not exist if the calling and called pages are generated at different times.

The opening and closing lines of the example use the `satellite.tag`. The `satellite.tag` is required at the beginning and end of every page containing Satellite tags.

The `cachecontrol` parameter, set on line 4, overrides the default cache expiration time that was set with the `expiration` property. In this case, a value of `never` means that the pagelet will never expire from the cache. This does not mean, however, that the pagelet will remain in the cache forever. If the cache is full, the pagelet can still be deleted to make room for newer pagelets.

```
1 <satellite:tag type="open"/>
2 <html>
3 <body>
```

```

4  <render:satellitepage pagename="QA/Satellite/Functional/
    xml/"pagelet1"cachecontrol="never"/>
5  </body>
6  </html>
7  <satellite:tag type="close"/>

```

Note that pagelets cached on CS-Satellite systems are not protected by Content Server ACLs. You can work around this by calling cached pagelets from an uncached containing page that is protected by ACLs.

### Caching a Blob

Using Satellite tags to load and cache a blob is similar to the way you use Satellite tags to load and cache a pagelet. The following sample code adds to the previous example by calling a blob as well as a pagelet.

Line 8 uses the `ics:selectto` tag to perform a simple SQL query that retrieves a blob from the database. Results are returned in the form of an `IList` named `imagelist`.

Line 13 uses the `satellite:blob` tag to load the blob that was retrieved from the database in line 8. As with the `satellite.page` tag, if the blob is not in Satellite's cache, Satellite will load and cache the blob. The `cachecontrol` parameter is set so that the blob will expire at a given time; in this case, every 30 minutes.

```

1  <satellite:tag type="open"/>
2  <html>
3  <body>
4  <!-- NOTE: This will fail if list has no content (== null)
   -->
5
6  <ics:setvar name="category" value="logo"/>
7  <ics:setvar name="errno" VALUE="0"/>
8  <ics:selectto from="SmokeImage" list="imagelist"
   where="category" limit="1"/>
9  <ics:if cond="IsError.Variables.errno=false">
10 <ics:then>
11 <!-- Test a blob -->
12
13 <render:satelliteblob service="img src"
   blobtable="SmokeImage"
   blobkey="id"
   blobwhere="imagelist.id"
   blobcol="urlpicture"
   blobheader="image/gif"
   cachecontrol="*:30:0 */*/*"
   alt="imagelist.alttext"
   border="0" />
14 </ics:then>
15
16 <render:satellitepage pagename="QA/Satellite/Functional/
   xml/"pagelet1"cachecontrol="never"/>
17 </body>
18 </html>
19 <satellite:tag type="close"/>

```

## Never-Expiring Blobs

If there are binary files (or blobs) on your site that seldom change or never change, such as company logos, and you are using the Satellite servlet to cache at the pagelet level, you can improve performance by using an alternative method to serve these blobs. However, note that you cannot use this method of serving blobs if you are using the FileServer servlet.

To serve never-expiring blobs, complete the following steps:

1. Comment out the following lines in `resin.conf` using the HTML comment delimiters "`<!--`" and "`-->`". This disables the FileServer servlet and allows static images to be used by the Satellite servlet.

```
<!--
    <servlet-mapping url-pattern='/*' servlet-name='FileServer' />
    <servlet servlet-name='FileServer'
        servlet-class='com.openmarket.Satellite.FileServer'>
        <init-param inipath = '../omkt/satellite' />
    </servlet>
-->
```

2. Copy the never-expiring images to all your CS-Satellite hosts. Place them under the doc root for your web server.
3. Access the images through `` HTML tags rather than through `satellite:blob` Satellite tags.

For example, consider a never-expiring corporate logo file named `CorporateLogo.gif`. To use the alternative method of serving blobs, you would first copy the file to the web server's doc root on all your CS-Satellite hosts. Then, instead of serving this logo through a `satellite.blob` tag, your element could simply use a tag like the following:

```

```

### Note

Be careful when using this mechanism for serving never-expiring images. For example, CS-Satellite cannot warn you that one of the CS-Satellite hosts does not contain the same image file as the other hosts.

```
http://myloadbalancer:1234/servlet/
ContentServer?pagename=myPage
```

The expiration of the page is controlled by the `expiration` property. For more information on the `expiration` property, see the *CSEE Administrator's Guide*.

## Viewing the Contents of the CS-Satellite Cache

The Inventory servlet allows you to view the various items stored in the cache. You invoke the Inventory servlet by using the following URL:

```
http://host:port/servlet/
Inventory?username=username&password=passwordword&detail
=value
```

where:

Parameter	Description
<i>host:port</i> (required)	The host name and port number of the CS-Satellite host whose cache you want to view.
username (required)	The user name that you enter to log you in to the CS-Satellite host.
password (required)	The password that you enter to log you in to the CS-Satellite host.
detail (optional)	<p>The type of information you wish the Inventory servlet to display. Valid values are:</p> <ul style="list-style-type: none"> <li>• <i>names</i> - Displays the header information, plus the page names of the pages in the cache.</li> <li>• <i>keys</i> - Displays the header information, plus the page names and keys of the items in the cache.</li> </ul> <p>If you do not supply the <i>detail</i> parameter, or if you set its value to be anything other than <i>name</i> or <i>keys</i>, the header information displays.</p>

The header contains the following information:

Information type	Description
Remote host	The host that this CS-Satellite system forwards requests to.
Maximum cache objects	The maximum number of items allowed in the cache.
Current size	The number of items currently in the cache.
Cache check interval	How often the cache is checked for expired items, in minutes.
Default cache expiration	The value of the <i>expiration</i> property.
Minimum file size (in bytes)	Items larger than this value are stored in files. Items smaller than this value are stored in RAM.

## CacheManager

Content Server's CacheManager object maintains both the Content Server and CS-Satellite caches. CacheManager can do the following:

- Log pagelets in the cache tracking tables
- Keep a record of the content (assets) that pages and pagelets contain by recording **cache dependency items** in cache-tracking tables. Cache dependency items are items that, when changed, invalidate the cached pages and pagelets that contain them. A cache dependency item is logged as a dependency for the current page and all of that page's parent pages.

- Remove pages and pagelets containing invalid items from the Content Server and CS-Satellite caches.
- Rebuild the Content Server and CS-Satellite caches with updated pages and pagelets after the invalid pages have been removed.

For web sites that use CS-Direct, CacheManager completes these operations automatically, ensuring that the pages that web site visitors see are always up to date.

For web sites that use Content Server alone, CacheManager's cache tracking and flushing are not automatic; however you can use CacheManager's Java API to implement similar functionality on your site. See Chapter 26, "The Portal Sample Site" for sample elements that use the CacheManager Java methods, and the *CSEE Java API Reference* for more information about the CacheManager Java API.

## The SiteCatalog Table

Content Server's SiteCatalog table lists the pages and pagelets generated by Content Server. An element must have an entry in the SiteCatalog table to be cached on Content Server and CS-Satellite.

The fields in the SiteCatalog table set the default behavior of a CSEE page, including default caching behavior. For more information on the SiteCatalog table and its fields, see "Creating Template Assets" on page 441 and "Creating SiteEntry Assets" on page 438.

## The Cache Key

Items stored in the Content Server and CS-Satellite caches are given a name called a **cache key**. The cache key uniquely identifies each item in the cache. CacheManager locates items in the cache using the cache key. Content Server and CS-Satellite generate cache keys automatically, based on the values in the `pagename` and `resargs` fields of the SiteCatalog table, and other internal data.

### PageCriteria and the Cache Key

You include variables used by the page in the cache key by specifying a PageCriteria variable in one of the SiteCatalog table's `resargs` fields. For example, suppose that you have a page called `myPage` which uses the values "red" and "blue". To include "red" and "blue" in `myPage`'s cache key, enter  
`PageCriteria=color1,color1&color1=red&color2=blue` in the `resargs1` field.

If you are running CS-Direct, the standard CS-Direct variables are set as PageCriteria in the `resargs1` field.

Content Server and CS-Satellite use the parameters that are passed cached pages to help generate the cache keys. If the parameters differ from one invocation to another, a different page will be cached even if the content generated is the same. For example:

```
http://mysatellite:1234/servlet/  
ContentServer?pagename=myPage&color=red
```

calls a different page than:

```
http://mysatellite:1234/servlet/  
ContentServer?pagename=myPage&color=blue
```



whether or not the content generated is the same. Values passed in by URL override values set in `PageCriteria`. For example, if you have `myPage`'s `PageCriteria` set to `PageCriteria=red,blue`, and you pass in a value of `green`, `green` will go into `myPage`'s cache key, not `red,blue`.

If a page does not have `PageCriteria` set, the values in the `resargs` fields go into the cache key. As with `PageCriteria`, values passed in by a URL override values specified in the `resargs` fields.

## Caching Properties

The default cache settings for Content Server and CS-Satellite are contained in the `futuretense.ini` file and can be modified using the Property Editor. Additional CS-Satellite properties are contained in `satellite.ini`.

The following tables outline the CS-Satellite caching properties, they are not complete; see the *CSEE Administrator's Guide* for more complete information on the caching properties.

### Content Server Properties

The following table describes the properties that control disk caching on Content Server.

#### Page Caching Properties

The following properties control page caching:

Property	What It Contains
<code>cs.SystemPageCacheTimeout</code>	Specifies the number of minutes a cached page is held in memory (cached pages are cached both to disk and to memory).
<code>cs.SystemPageCacheSz</code>	Specifies the maximum number of pages that can be cached in memory. Pages are cached both in memory and to disk (database). This property specifies the number of pages cached to memory, not to disk.
<code>cs.pgCacheTimeout</code>	Default timeout for disk-cached pages.
<code>cs.freezeCache</code>	Controls whether Content Server expires pages in the disk cache. Specify <code>yes</code> to prevent the disk cache from being cleared independently of per-page entry information.
<code>cs.noCache</code>	Disables all disk-based page caching. In general, you should enable caching by setting this property to <code>false</code> . If necessary, you can disable caching on a table by table basis by setting this property to <code>true</code> .
<code>cs.alwaysUseDisk</code>	Specifies the default behavior for page entries in the SiteCatalog that have no cache override property specified. If set to <code>yes</code> , then each page served from Content Server will always be cached to disk.
<code>ft.pagecachedebg</code>	If set, this property logs adding of pages to cache as well as just returning pages from cache.

## CS-Satellite Properties

CS-Satellite has two sets of properties; one set is in the `futuretense.ini` file on your Content Server system. The other property set is in the `satellite.ini` file on each CS-Satellite host. The following tables describe both CS-Satellite property sets.

### futuretense.ini Properties

The following properties in `futuretense.ini` control CS-Satellite caching:

Property	What It Represents
<code>cs.satellitehosts</code>	<p>A comma-separated list of CS-Satellite systems that will be used with this Content Server.</p> <p>HTTPS and special ports are supported. Specify a fully qualified domain name if it is required.</p>
<code>cs.satelliteusers</code>	<p>A comma-separated list of CS-Satellite usernames that correspond to the CS-Satellite systems described in <code>cs.satellitehosts</code>.</p> <p>The number of specified users must correspond to both the number of CS-Satellite systems and the number of passwords specified.</p>
<code>cs.satellitepassword</code>	<p>A comma-separated list of CS-Satellite passwords that correspond to the CS-Satellite user names described in <code>cs.satelliteusers</code>.</p> <p>The number of passwords must correspond to both the number of CS-Satellite systems and the number of user names specified.</p>
<code>satellite.page.cachecontrol.default</code>	<p>Specifies a default value for the <code>cachecontrol</code> parameter for the <code>satellite.page</code>, and <code>RENDER.SATELLITEPAGE</code> tags and their JSP equivalents.</p> <p>Default value: blank</p> <p>Set this property to a value that is appropriate for the majority of your pages and pagelets, and then use the <code>cachecontrol</code> parameter with the <code>satellite.page</code> and <code>RENDER.SATELLITEPAGE</code> tags to override this value for individual pages and pagelets.</p>

Property	What It Represents
<code>satellite.blob.cachecontrol.default</code>	<p>Specifies a default value for the <code>cachecontrol</code> parameter for the <code>satellite.blob</code>, and <code>RENDER.SATELLITEBLOB</code> tags and their JSP equivalents.</p> <p>Default value: blank</p> <p>Set this property to a value that is appropriate for the majority of your blobs, and then use the <code>cachecontrol</code> parameter with the <code>satellite.blob</code> and <code>RENDER.SATELLITEBLOB</code> tags to override this value for individual blobs.</p>

## satellite.ini Caching Properties

The following properties in `satellite.ini` control caching:

Property	What It Represents
<code>cache_folder</code>	<p>Specifies the directory into which CS-Satellite will cache pagelets to disk. The default directory is:</p> <pre>\$SatelliteServerRoot/omkt/satellite/cache</pre> <p>You can specify only one directory. The directory you specify does not necessarily have to be on the same drive as <code>/omkt</code>. However, for performance reasons, it should be.</p> <p><b>Note:</b> This property must be specified or a fatal error will occur.</p>
<code>file_size</code>	<p>Separates disk-cached pagelets and blobs from memory-cached pagelets and blobs. You specify a size (in kilobytes). CS-Satellite caches to disk any pagelet or blob larger than this size and caches to memory any pagelet or blob smaller than this size.</p>
<code>expiration</code>	<p>Sets the default value for how long objects stay in CS-Satellite's cache.</p> <p>If you are using the Satellite servlet to cache at the pagelet level, you can override this property on a pagelet-by-pagelet basis by using Satellite tags. The containing page will expire at the default setting. You cannot use Satellite tags to modify the default expiration time for the containing page.</p> <p><b>Note:</b> This property must be specified or a fatal error will occur.</p>
<code>cache_check_interval</code>	<p>When a disk-cached page expires, CS-Satellite does not immediately delete the page from the disk. Instead, CS-Satellite removes this page from its list of active pages and CS-Satellite's cache pruning program removes the expired pages from the cache.</p> <p>The <code>expiration</code> property sets the default value for how long objects stay in CS-Satellite's cache.</p>

Property	What It Represents
cache_max	Specifies the maximum number of objects (pagelets and blobs) that can be cached (memory cache and disk cache combined) at a time. The default value is 500, meaning that CS-Satellite will cache up to 500 objects at a time.
cache_debug	Turns on CS-Satellite's cache debugging feature. A value of <code>true</code> sends debug messages to the CS-Satellite's UNIX shell.

For more information about these and other CS-Satellite properties, see the *CSEE Administrator's Guide*.

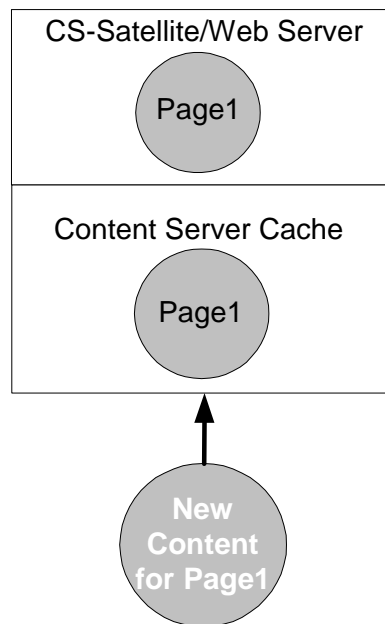
## Double-Buffered Caching

CS-Direct, CS-Direct Advantage, and CS-Engage implement a double-buffered caching strategy, which uses the Content Server and CS-Satellite caches in tandem on your live web site. This double-buffered caching strategy ensures that pages are always kept in cache, either on Content Server or CS-Satellite.

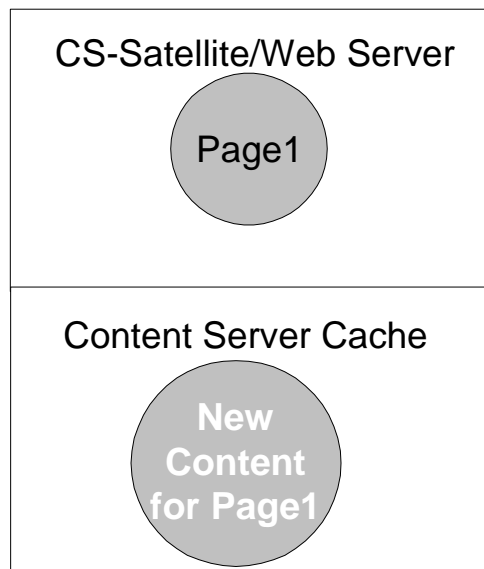
You can implement a similar caching strategy if you are running Content Server and CS-Satellite without any of the other content applications by using the CacheManager Java API. For more information about the CacheManager Java API, see the *CSEE Java API Reference*.

If you are running CS-Direct, both the Content Server and CS-Satellite caches are maintained by Content Server's CacheManager object. CacheManager tracks when content changes by logging elements and the assets that those elements call in cache tracking tables.

When assets are updated and published, the Content Server and CS-Satellite caches are automatically flushed and updated in the following order:

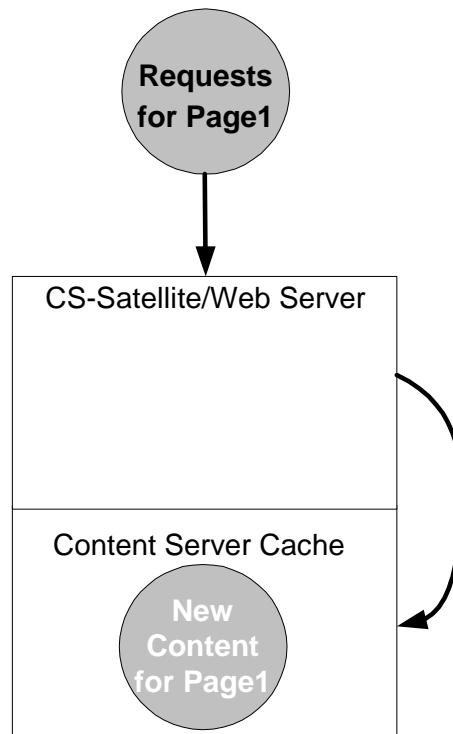


- Content providers publish updated assets to the delivery system. CacheManager checks the cache tracking tables to see which cached items are affected by the updated assets.

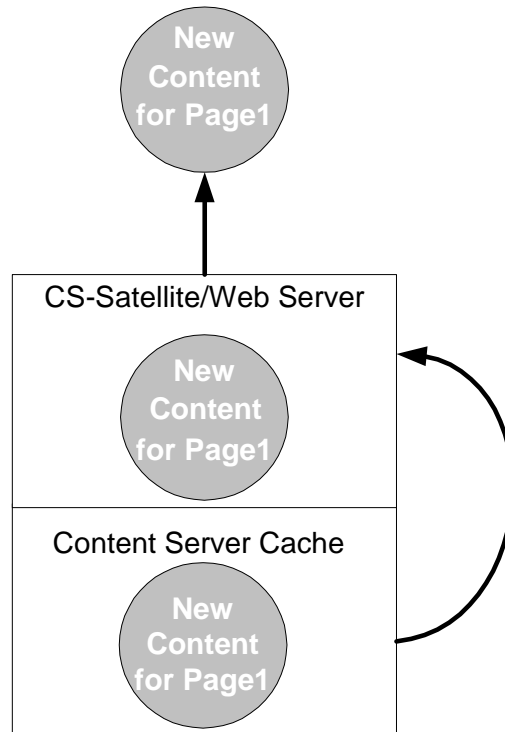


- CacheManager flushes the outdated Page1 from the Content Server cache, then reloads the Content Server cache with the updated Page1.

Any requests for `Page1` will be served the old version of `Page1` from the CS-Satellite cache. This protects the Content Server machine from undue load as it deletes and rebuilds its cache.



- CacheManager flushes the outdated items from the CS-Satellite cache. As visitors come to the web site and request `Page1`, the CS-Satellite searches to see if `Page1` is in its cache. Because `Page1` is not in the CS-Satellite cache, the request is passed on to Content Server.



- The CS-Satellite system's cache is filled with an updated version of `Page1`, taken from the Content Server cache. The updated page is served to the requestors. If `Page1` were requested again, the page would be served from the CS-Satellite cache.

## Implementing Double-Buffered Caching

The first step in implementing double-buffered caching on your web site is to design modular pages, as described in “Modular Page Design” on page 95. Once you have developed a modular page design, you implement a double-buffered caching strategy in three steps:

- Develop a pagelet caching strategy
- Set how individual pages and pagelets are cached using the `cachecriteria` field of the `SiteCatalog` table
- Code your elements with Satellite tags

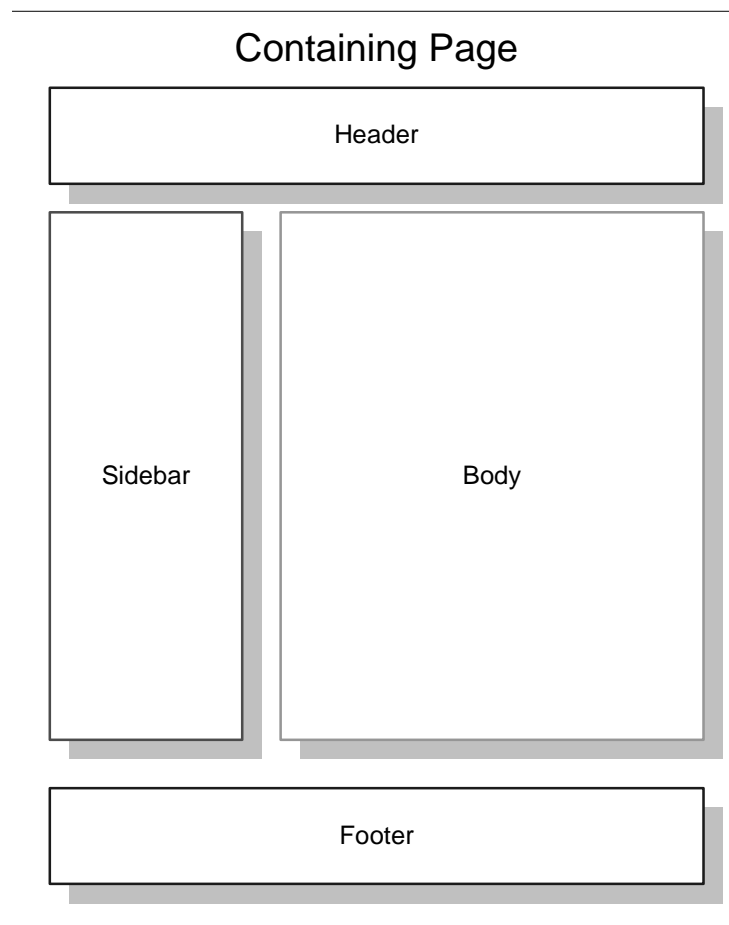
## Pagelet Caching Strategies

With a modular page design, caching occurs at the pagelet level; the containing page is never cached, so that any cached pagelets are always protected by ACLs. You choose which pagelets get cached based on how frequently they are updated.

The following table summarizes the guidelines for caching pagelets:

Cache a Pagelet	Don't Cache a Pagelet
<ul style="list-style-type: none"> <li>• If the content seldom changes.</li> <li>• If the pagelet does not contain logic that requires evaluation to work.</li> </ul>	<ul style="list-style-type: none"> <li>• If the content changes frequently.</li> <li>• If the content must be “real time.”</li> <li>• If the pagelet contains code that checks for ACLs, or other logic that requires evaluation to work.</li> </ul>

The following diagram is an example of a modular page:



The containing page should never be cached; this allows you to put logic, which requires evaluation by Content Server, into your pages, while still gaining the performance benefits of caching. It also allows your page to be protected by Content Server ACLs.



The header and footer pagelets in this example should be disk cached. They rarely get updated, and should be designed accordingly. The header and footer may be static HTML written into your template, or disk-cached content from Content Server.

The sidebar is also a good candidate for disk caching. It has a small number of variations, and its content is determined by a small number of parameters.

Determining how to cache the body pagelet is more complex. The contents of the body pagelet probably depend on where the web site visitor is in the site. There are three possible types of content for the body pagelet:

- The results of a search that the web site visitor runs
- The results of a frequently run query
- An article

your caching strategy should be as follows:

- If the content of the body pagelet is the result of a search based on parameters that the web site visitor enters, you do not want to cache it. Such pages change for each visitor, and there is little benefit to caching them.
- If the content is the product of a standard query that visitors often use, you should use resultset caching. Caching frequently run queries in the memory cache improves performance. For more information on resultset caching, see Chapter 12, “Resultset Caching and Queries.”
- If the content of the body pagelet is the text of an article, you should cache the pagelet to disk.

## Setting cacheinfo

The values in the `cacheinfo` field of the `SiteCatalog` table allow you to control how pages get cached on Content Server on a page-by-page basis.

You can change these properties for each page in your web site. For example, if you want a containing page element to be uncached on Content Server, set the values in `cachecriteria` to `false`.

For more information on the `cacheinfo` field, see “Creating Template Assets” on page 441.

## Coding for Caching

To implement double-buffered caching, you code your elements with CS-Satellite tags. If you are running Content Server and CS-Satellite only, use the Satellite tags documented in the CS-Satellite sections of the *CSEE Developer's Tag Reference*.

If you are running CS-Direct, use the `satellite.tag` tag to open and close any pages that you want to be cached. As you code the pages, use the `RENDER.SATELLITE` tags to render your assets.

Automatic cache maintenance is dependent upon logging your assets in the cache tracking tables. If you use the `ASSET.LOAD` tag to load an asset, that asset is automatically logged in the cache tracking tables. For those sections where `ASSET.LOAD` is not used, use the `RENDER.LOGDEP` tag to log content in the cache tracking tables.

**Note**

Cache dependencies are only logged if a page or pagelet is cached on Content Server. If a page is uncached on Content Server but cached on CS-Satellite, that page will not be automatically flushed from the cache when its content is updated.

**Caching and Security**

Cached pagelets require special security considerations as you design your site and develop your caching strategy. The following sections outline security considerations for pages cached in the Content Server and CS-Satellite caches.

**Content Server Security**

Pagelets that are disk cached on Content Server are bound by Content Server's ACLs, allowing you to use those ACLs to prevent unauthorized access to a page.

Note, however, that although Content Server checks the ACL of a containing page, it does not check the ACLs of the pagelets that the containing page calls. For example, suppose that your site uses three ACLs: Open, Secret, and TopSecret. Your containing page can be viewed by members of the Open ACL, but it calls pagelets that should only be viewed by members of the Secret and TopSecret ACLs. Because Content Server only checks a visitor's ACL of the containing page, visitors with the Open ACL can view content meant for members of the Secret and TopSecret ACLs.

To ensure that all the relevant ACLs are checked, complete the following steps:

1. Include the ACL for the page that you want to protect in that page's cache criteria, as shown in the following sample code:

```
<render.satellitepage pagename="innerwrapper"
userAcl="SessionVariables.member" c="Article" cid="123">
```

2. In the pagelet, insert code to check the ACLs, as shown in the following sample:

```
<asset.load name="art" type="Variables.c"
OBJECTID="Variables.cid"/>
<ASSET.GET NAME="art" FIELD="myACL"/> <!-- note you need a column
in your db to support this -->
<IF COND="Variables.userACL=Variables.myACL">
<THEN>
<render.satellitepage pagename="protected_art_tmpl1"
c="Variables.c" cid="Variables.cid"/>
</THEN>
<ELSE>
<render.satellitepage pagename="accessDenied"/>
</ELSE>
</IF>
```

## CS-Satellite Security

Pagelets that will be cached on CS-Satellite are only bound by Content Server ACLs under the following circumstances:

- If they are retrieved from the Content Server cache
- If they must be generated by Content Server to fulfill the page request

If a pagelet is served from the CS-Satellite cache, it is no longer protected by Content Server ACLs.

To ensure that the content of your CS-Satellite pages is secure, never cache your containing page and be sure that you put an ACL checking mechanism in the uncached container.

If your elements are coded with Satellite tags but you do not yet have CS-Satellite installed, the page design considerations outlined in the Content Server Security section apply to you. Once CS-Satellite is installed, however, Content Server checks the ACLs of uncached pagelets called from a containing page. The ACLs of pagelets cached on CS-Satellite are not checked.



## Chapter 5

# CSEE Tools and Utilities

CSEE includes several tools and utilities that you use together with the Content Server browser-based interface for developing and maintaining your web sites. This chapter provides brief descriptions of these utilities, and tells you how to start them. It includes the following sections:

- Content Server Explorer
- CatalogMover
- Property Editor
- Page Debugger
- XMLPost

## Content Server Explorer

The Content Server Explorer tool is a Microsoft Windows application for viewing and editing tables and rows in the Content Server database, and for creating and editing executable elements (or files) written in XML or JSP. You use Content Server Explorer to do the following:

- Add entries to tables
- Edit rows within tables
- Track revisions to rows of tables
- Create and drop Content Server tables
- Organize tables and folders into projects
- Preview SiteCatalog records as pages in a browser
- Export and import records as integrated .cse type files
- Export and import tables and projects in .zip files

Content Server Explorer is installed along with Content Server.

## Connecting to a Content Server Database

You can use Content Server Explorer on any remote Microsoft Windows machine simply by copying the Content Server Explorer directory on a machine where Content Server is installed (`tools/ContentServerExplorer`) to a directory on the remote machine. You then start the Content Server Explorer executable file (`ContentServerExplorer.exe`) and log in to Content Server by supplying a user name, password, hostname, port, and protocol information.

To connect to a system that is running Content Server:

1. Start Content Server Explorer.
2. Choose **File > Open Content Server** to display the Login dialog box.
3. Enter the following values:

**Name** – Your Content Server user name.

**Password** – Your Content Server password. (Depending on your site security, it may not be necessary to enter a name and password.)

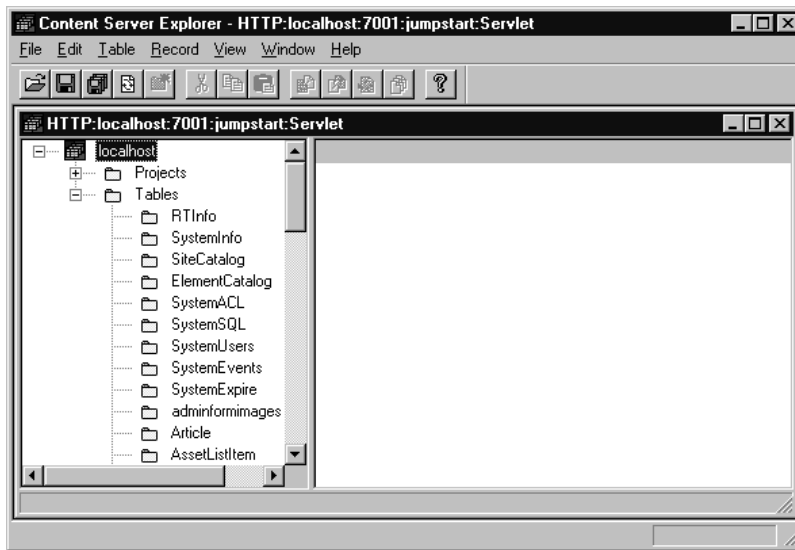
**Host name** – The hostname or IP address. You cannot leave this field blank.

**Port** – The port number (the default is 80).

**Protocol** – Typically, this is HTTP. (You may select HTTPS if the web server is running SSL.)

**Application server URL path** – The type of application server for your site.

4. Click **OK** to log in. The Content Server Explorer window appears:



You may want to create a shortcut on your Windows desktop to Content Server Explorer. For instructions about using Content Server Explorer, see the online help as well as sections in this manual that describe specific tasks requiring Content Server Explorer. For more information on Content Server Explorer and its features, see the Content Server Explorer online help.

## CatalogMover

You use the CatalogMover tool to export and import Content Server database tables, including the `ElementCatalog` and `SiteCatalog` tables. For example, you can use CatalogMover to export page elements and content assets to one system, and load the same elements and assets into the database on another system. You can export and import database tables as either HTML files or ZIP files.

You can use CatalogMover through either the Windows interface described in the following sections, or the command line interface described in “Command Line Interface” on page 125.

### Note

In previous versions of Content Server, tables in the Content Server database were called “catalogs.” This term still applies to the names of some database tables as well as to the CatalogMover tool itself.

## Starting CatalogMover

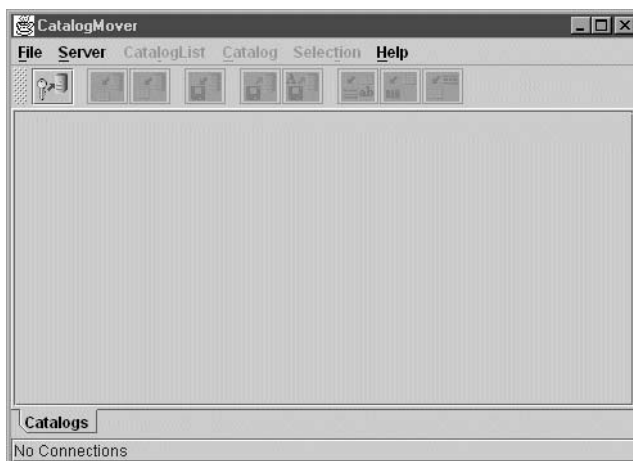
To start CatalogMover, execute the following scripts at the MS DOS prompt or in a UNIX shell:

- Windows: `CatalogMover.bat`
- Solaris: `CatalogMover.sh`

The following JAR files must be in the classpath, or be specified by the `-classpath` switch:

```
cs.jar  
swingall.jar
```

The CatalogMover window appears:



## Connecting to CSEE

Before using CatalogMover, you must first connect to a CSEE system.

To connect to CSEE, do the following:

1. Choose **Server > Connect**. The Connect to Server dialog box appears.
2. In the **Server** field, enter the name of the HTTP server you want to connect to, and the port on which the server is running.
3. In the **Name** field, enter your user name.
4. In the **Password** field, enter your password.
5. To merge CSEE property (.ini) files, enter the names of two property files separated by a semicolon in the **'infile'(s)** field. If you do not want to merge property files, leave this field blank. (For more information, see “CatalogMover Menu Commands” on page 120.)
6. Select one of the following radio buttons:
  - **Standard Servlets** – to connect to a system using WebSphere or WebLogic.
  - **Sun ONE Application Server** – to connect to a system using Sun ONE Application Server.
  - **Custom** – to connect to a different application server, enter the following value in the text box:  
`<ft.approot><ft.cgipath>/CatalogManager.`
7. Click **Connect**.

## CatalogMover Menu Commands

CatalogMover includes the following menu commands:

### File Menu

- **Exit** – Disconnect from Content Server and close CatalogMover.

### Server Menu

- **Connect** – Display the Connect to Server dialog box.
- **Reconnect** – Display the Connect to Server dialog box and renew the current Content Server connection.
- **Disconnect** – Disconnect from Content Server.
- **Purge Temporary Tables** – Purge imported tables before committing.
- **Commit Individual Tables** – Commit imported tables to the database.
- **Normalize Filenames on Export** – Enable CatalogMover's file name normalization behavior, which changes the names of files that are being moved to names that match their corresponding ID numbers. If this feature is not enabled, file names are not altered.



## CatalogList Menu

- **Load** – Display a list of all tables in the database.

## Catalog Menu

- **Load** – Load into local memory a table from the list. The following figure shows a loaded `ElementCatalog` table:

Table Name	Status
Attribute	
Category	
CheckOutInfo	
Collection	
Collectionextn	
CollectionOrder	
ContentCategory	
DefWorkflowRoles	
ElementCatalog	Loaded
Folder	
Folderextn	
ForumX	
ForumXTools	

Catalogs   **ElementCatalog**

Click the **Element Catalog** tab to view all rows in the table, and to select specific rows for export.

- **Refresh** – Update the loaded tables from the Content Server database.
- **Auto Import Catalog(s)** – Import a previously exported ZIP file.
- **Import Catalog** – Import into the local database a table that was exported from another Content Server database.
- **Export Catalog Rows** – Export the selected rows in the loaded table.

## Selection Menu

- **Select All Rows** – Select all rows in the currently displayed table.
- **Deselect All Rows** – Deselect all rows in the currently displayed table.
- **Select Rows By SubString** – Select rows in the currently displayed table by typing a portion of any field value string that uniquely identifies a set of rows.

## Help Menu

- **About** – Display version information about the Content Server installation.

## Exporting Tables

**Exporting** is the process of retrieving table rows and their content from the database and saving them in local HTML files and associated data directories. CatalogMover creates one HTML file per table.

To export selected table rows:

1. Connect to Content Server as described in “Connecting to CSEE” on page 120.
2. Choose **CatalogList > Load** to display a list of all tables in the database
3. Choose **Catalog > Load** to load a table, and select rows as described in “Selecting Rows for Export” below.

#### 4. Choose **Catalog > Export Catalog Rows**.

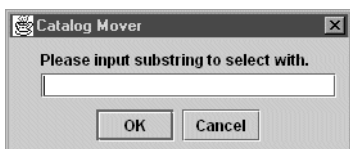
A dialog box appears prompting you to specify a directory for the HTML file containing the exported rows.

#### 5. Navigate to your directory of choice, and click **Save**.

CatalogMover exports the selected rows to your selected directory.

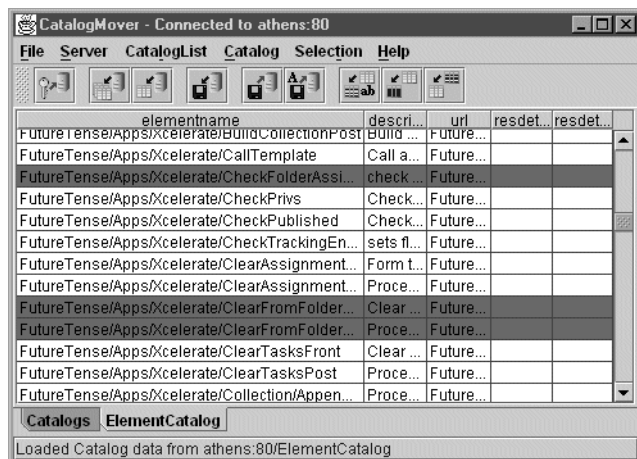
## Selecting Rows for Export

You can select specific rows for export in a loaded table by clicking on them, or you can search for specific rows by substring. To search for and select rows according to a substring, choose **Selection > Select Rows By SubString**. The following dialog box appears:



In the text field, enter the substring you want to locate. For example, if you wanted to search the ElementCatalog primary key for all rows with “folder” in the element name, enter `folder` and click **OK**.

CatalogMover searches the table and selects the rows that match your substring query against the primary key for the table, as shown in the following figure:



### Note

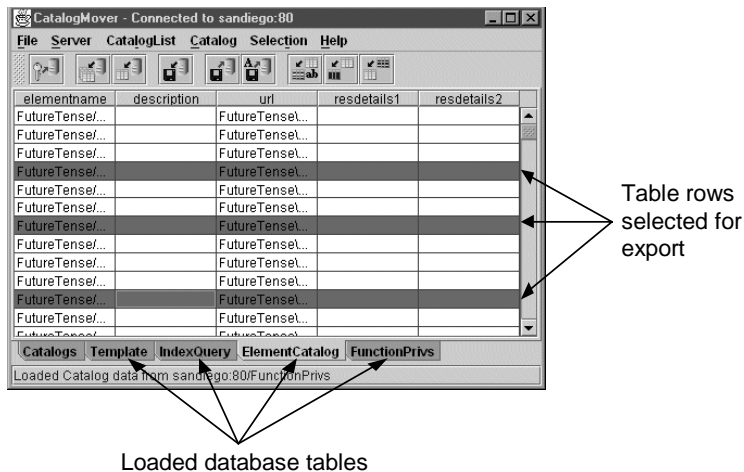
Selecting rows by substring only works for the left-most column in the table. However, you can change column positions so that any column can become the left-most column. To do this, simply click and drag the column header.

## Exporting to a ZIP File

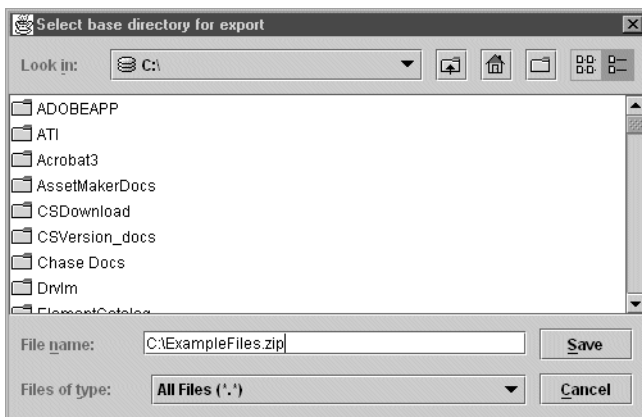
You can select several rows from several tables and export them to a ZIP file on local machine from which you are running CatalogMover. Once you create the ZIP file, you can import the contents of the file into server tables.

To export a ZIP file with CatalogMover:

1. Choose **CatalogList > Load** to display a list of all tables in the database
2. Choose **Catalog > Load** to load a table, and select rows as described in “Selecting Rows for Export” .



3. Choose **Catalog > Export Catalog Rows**. The following dialog box appears:



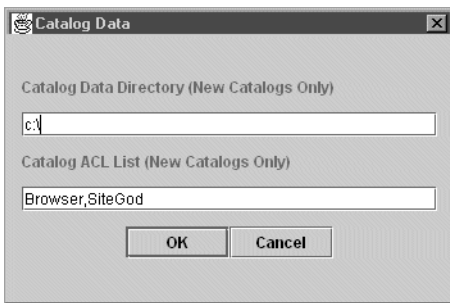
4. Navigate to the directory where you want to save the ZIP file.
5. In the **File Name** field, enter a name for the files and type a .ZIP file extension.
6. Click **Save**. The rows you selected from all of the tables are exported to a ZIP file in the directory you chose.

## Importing Tables

**Importing** is the process of sending locally stored HTML files and the associated data to the server. You can select a particular HTML file to import, or you can choose to import all HTML files.

To import HTML files that have been previously exported from another table:

1. Connect to the Content Server installation you want to import the HTML files to, as described in “Connecting to CSEE” on page 120.
2. Choose **CatalogList > Load** to display a list of all tables in the database.
3. Choose **Catalog > Import Catalog**.
4. Navigate to the HTML file containing the previously exported table rows.
5. Select the HTML file and click **Open**. The following dialog box appears:



6. If you are importing new table rows that do not currently exist, enter the information in the **Catalog Data Directory** and the **Catalog ACL List** fields.

If you are replacing existing table rows with the imported table rows, leave these fields blank.

7. Click **OK**. The table rows contained in the previously export HTML file are imported into the Content Server database to which you are connected.

A dialog box appears, listing the table rows that were imported.

### Note

If you import tables that do not exist on the server to which you are connected, the new tables are automatically created as they are imported.

## Importing a Previously Exported ZIP File

You can import table rows stored in an exported ZIP file to your server using CatalogMover. To import a previously exported ZIP file:

1. While connected to your database, choose **Catalog > Auto Import Catalogs**.
2. In the resulting dialog box, navigate to the directory where you previously exported the table rows. To see the ZIP file, change the **Files by Type** drop-down menu to **all files**.
3. Select the ZIP file and click **Save**. The rows contained in the ZIP file are automatically imported to your database.

## Merging Existing CatalogMover Files

1. Connect to the Content Server installation you want to import the HTML files to, as described in “Connecting to CSEE” on page 120.
2. Choose **CatalogList > Load** to display a list of all tables in the database.
3. Choose **Catalog > Load** to load a table, and select the rows that you want to merge into another file, as described in “Selecting Rows for Export” .
4. Choose **Catalog > Export Catalog Rows**.
5. Navigate to the HTML file you want to merge the rows with. Click **Save**. The following dialog box appears:



6. Click **Update existing exported data**. CatalogMover merges the exported rows into the HTML file you selected.

## Replacing Existing CatalogMover Files

1. Connect to the Content Server installation you want to import the HTML files to, as described in “Connecting to CSEE” on page 120.
2. Choose **CatalogList > Load** to display a list of all tables in the database.
3. Choose **Catalog > Load** to load a table, and select the rows that you want to merge into another file, as described in “Selecting Rows for Export” .
4. Choose **Catalog > Export Catalog Rows**.
5. Navigate to the HTML file you want to merge the rows with. Click **Save**. The following dialog box appears:



6. Click **Replace existing exported data**. CatalogMover replaces rows in the HTML file you selected with the exported rows.

## Command Line Interface

The following parameters allow CatalogMover to perform functions without displaying a GUI. The parameter is followed by a space followed by the value:

Parameters	Description
-h	display command line parameters
-u <i>username</i>	username
-p <i>password</i>	password
-s <i>servername</i>	servername to connect
-b <i>baseurl</i>	base URL – either <code>http://(\$host)/cgi-bin/gx.cgi/AppLogic+FTCatalogManager (NAS)</code> or <code>http://(\$host)/servlet/CatalogManager(WebLogic)</code>
-t <i>table</i>	table name – used when exporting to designate tables to export, use multiple -t parameters to export multiple tables
-x <i>function</i>	function to perform – legal values are import, import_all, export, export_all
-d <i>directory</i>	directory – When exporting, directory to contain exported tables. When importing all, directory containing all tables to import.
-f <i>filename</i>	file containing table to import – Can either be an HTML file or a ZIP file generated by export.
-c <i>directory</i>	upload directory to be used if creating a table
-a <i>aclone, acltwo, ...</i>	ACL list – comma separated list of ACLs to be used if creating a table

## Property Editor

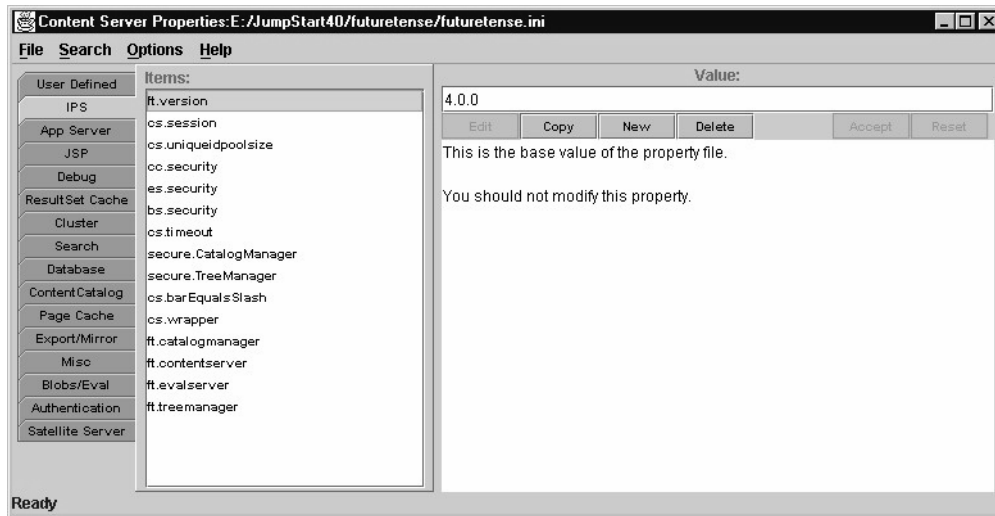
The Property Editor tool provides an easy-to-use Windows interface that lets you view, modify, and add properties in the Content Server `futuretense.ini` file.

### Starting the Property Editor

To start the Property Editor, run the following scripts:

- On Windows NT: `propeditor.bat`
- On Solaris: `propeditor.sh`

The Properties window appears:



The Properties window displays properties in functional groups, such as Database and Caching, on the left side of the window.

The **Items:** pane lists the properties in the selected functional group.

The **Value:** pane lists the current value for the selected item, a brief description of the item, and the acceptable values for it.

#### Note

The `futuretense.ini` file contains a release number string, `ft.version`, which contains a value such as 4.0.0. that is set by Content Server.

Do not modify this property—it is for reference only.

## Setting Properties

To set Content Server properties on your system:

1. If necessary, start the Property Editor.
2. Choose **File > Search** and open the `.ini` file you want to edit.
3. Select a properties group from the tabs on the left side of the window. The Property Editor displays the properties in the **Items:** pane.
4. Select a property in the **Items:** pane. The Property Editor displays the current property value and a brief description in the **Values:** pane.
5. In the **Values:** pane, enter the new value in the text field.
6. In the **Values:** pane, click the **Accept** button.
7. Repeat steps 3 through 6 for all the properties you want to change..
8. When you finish, choose **File > Save** to save your changes.
9. Click **OK** in the confirmation message box.
10. Choose **File > Save** to save your changes and close the Property Editor.

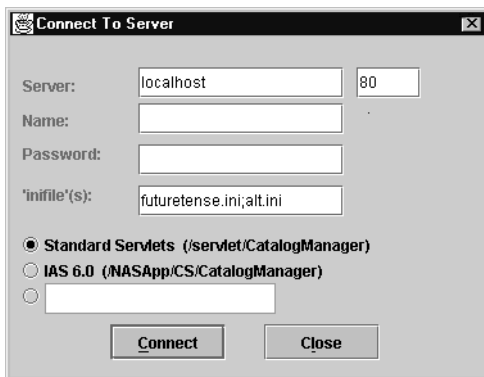
11. Stop and restart the application server to apply the changes.

## Merging Property Files

You ordinarily use the Property Editor to modify the `futuretense.ini` property file. You can also add properties to your property file from the property file on the server to which you are connecting. For example, if the `futuretense.ini` file on the server you are connecting to contains properties from another application like CS-Direct, those CS-Direct properties can be automatically added to your `futuretense.ini` file upon connection. If you have the same properties with different values defined in multiple `.ini` files, Content Server uses the values in the last property file that it loads.

To merge a property file with the `futuretense.ini` file, enter the names of the two property files separated by a semicolon in the **'inifile'(s)** field when you connect to Content Server. If you do not want to merge property files, leave this field blank.

For example, the following Connect to Server dialog box shows a merge between `futuretense.ini` and `alt.ini`:



As another example, if you have CS-Direct installed on top of Content Server, you would merge property files for Content Server (`futuretense.ini`) and CS-Direct (`futuretense_xcel.ini`). In this case, you would enter the following:

```
futuretense.ini;futuretense_xcel.ini
```

## Page Debugger

The Page Debugger is a tool that lets you step through the execution of XML and JSP elements. You can view the values of variables as the element executes, and more easily determine where errors occur in your code.

The Page Debugger provides basic debugging commands that you can use to:

- Step into a called element
- Step over a called element
- Step out of a called element
- Continue to the cursor location
- Continue executing to the end of the element file

For more information, see Chapter 7, “Error Logging and Debugging.”



## XMLPost

The XMLPost utility imports data into the Content Server database. This utility is based on the Content Server FormPoster Java class and it is delivered with the Content Server base product. It imports data using the HTTP POST protocol.

To import assets, you use XMLPost with posting elements that are delivered with CS-Direct and CS-Direct Advantage. For information about using XMLPost to import assets, see the following chapters:

- Chapter 16, “Importing Assets”
- Chapter 17, “Importing Flex Assets”



## Chapter 6

# Sessions and Cookies

This chapter explains how to use XML tags to manage sessions and cookies. It contains the following sections:

- What Is a Session?
- Session Lifetime
- Sessions Example
- What Is a Cookie?
- Cookie Example
- Tips and Tricks
- CS-Satellite Session Tracking

## What Is a Session?

Imagine a web site containing two pages: `main` and `water`. Suppose a visitor sees `main` first and then moves onto `water`. HTTP is a stateless protocol. So, if a typical web server is managing this site, any knowledge gathered at `main` is lost when the visitor browses over to `water`. In other words, `water` cannot take advantage of any information that the visitor might have provided at `main`.

To get around this limitation, application servers detect when a visitor first enters a web site. At that point, the application server starts a **session** for this visitor. In the preceding example, when the visitor requests the `main` page, the application server starts a session. The web site designer can use `main` to gather information about the visitor and store that information in **session variables**. The information in session variables is available to all subsequent pages. So, for example, if Bob provides his age to `main`, and `main`'s designer wrote the age to a session variable, then `water` could easily access Bob's age.

**Session variables** contain values available for the duration of the session. When the session ends, the application server destroys the session variables associated with that

session. Each session variable consumes memory on the application server, so creating unnecessary session variables can hurt performance.

Content Server automatically creates some session variables; the web site developer can optionally create others.

The application server can maintain sessions on a cluster.

## Session Lifetime

A session begins when a visitor first hits your web site. The session ends when any of the following happens:

- The visitor terminates his browser.
- The session has timed out. The `cs.timeout` property holds the value of this timeout period (in seconds). For example, if `cs.timeout` is set to 300, then Content Server terminates a session if a visitor goes more than 300 seconds without requesting a page at the web site. When the visitor eventually requests a new page from the web site, Content Server creates a new session.
- The system administrator stops the application server.

## Session Variables Maintained by Content Server

Upon creating a session, Content Server automatically creates the following session variables:

Session Variable	What it Holds
<code>SessionVariables.currentUser</code>	The id of the visitor logged in.
<code>SessionVariables.currentAcl</code>	The comma-separated list of all ACLs to which this visitor belongs. If the visitor has not explicitly logged in, the default ACL is <code>Browser</code> .
<code>SessionVariables.username</code>	The username under which this visitor is logged in. If the visitor has not explicitly logged in, the default username is <code>DefaultReader</code> .
<code>SessionVariables.iniFile</code>	The name of the file containing Content Server properties.

## Logging In and Logging Out

When a visitor first hits the site, Content Server creates a session and implicitly logs in the visitor as `DefaultReader`. During the session, if the visitor explicitly logs in, Content Server automatically updates the values of `SessionVariables.currentUser`, `SessionVariables.currentAcl`, and `SessionVariables.username`. Logging in does not affect the values of any other session variables. In other words, if your pages create session variables prior to a login, then those values are still valid after the login. When a visitor explicitly logs out, the Content Server-generated session variables

automatically revert to the values they held prior to login. For example, consider the following sequence:

1. A visitor first hits a page, so the value of `SessionVariables.username` is `DefaultReader`.
2. The visitor logs in as marilyn, so the value of `SessionVariables.username` is `marilyn`.
3. If marilyn logs out, the value of `SessionVariables.username` reverts to `DefaultReader`.

To trigger a logout, you call the `<CATALOGMANAGER>` tag with the `ftcmd=logout` modifier. When issuing this tag, you can optionally supply the `killsession` modifier, which destroys the current session. You can then create a new session by invoking the `<CATALOGMANAGER>` tag with the `ftcmd=login` modifier.

## Sessions Example

Here's a simple session example, consisting of three very short elements:

Element	What it Does
FeelingsForm	Asks visitors to pick their current mood.
SetFeelings	Assigns the current mood to a session variable.
Meat	Evaluates the session variable.

### FeelingsForm Element

The feelings form doesn't really involve sessions or variables; this element merely generates a form. The visitor's chosen mood is passed to the `SetFeeling` element:

```
<form action="ContentServer" method="post">
  <input type="hidden" name="pagename"
    value="CSGuide/Sessions/SetFeelings"/>

  <P>How are you feeling right now?</P>
  <P>
  <select name="Feeling" size="1">
    <option>Good</option>
    <option>Not so Good</option>
  </select>
</P>

  <P><input type="submit" name="doit" value="Submit"/></P>
</form>
```

The resulting page looks like the following:

How are you feeling right now?

Not so Good ▼

Submit

## SetFeeling Element

Upon clicking the Submit button, the visitor is transported to SetFeeling. This element assigns the visitor's mood to a new session variable named CurrentFeeling.

```
<SETSSVAR NAME="CurrentFeeling" VALUE="Variables.Feeling"/>
```

```
<P>Welcome to our site.</P>
```

```
<P>Now proceed to
```

```
<A href="ContentServer?pagename=CSGuide/Sessions/Meat">
some meaty content.
```

```
</A></P>
```

The resulting page looks as follows:

Welcome to our site.

Now proceed to some meaty content.

If an element in this application asked the visitor to login, Content Server would have automatically set the username session variable to the visitor's login name. In that case, you could have personalized the welcome message in SetFeeling as follows:

```
<P>Welcome to our site, <CSVAR
NAME="SessionVariables.username"/>
</P>
```

## Meat Element

Upon clicking some meaty content, the visitor is transported to the Meat page. This page evaluates the session variable:

```
<IF COND="SessionVariables.CurrentFeeling=Good">
<THEN>
<P>Sessions are happiness.</P>
</THEN>
<ELSE>
<P>Don't let sessions get you down.</P>
</ELSE>
</IF>
```

A visitor in a not so good mood sees:

Don't let sessions get you down.

Notice how CurrentFeeling was available to Meat. In fact, CurrentFeeling is available to any other elements in the session.

## What Is a Cookie?

A **cookie** is a string that your application writes to the visitor's browser. A cookie stores information about visitors that lasts between sessions. The visitor's browser writes this string to a special cookie file on the visitor's disk. When that visitor returns to your web site, the visitor's browser sends a copy of the cookie back to the web server that set it. Once a cookie has been created, it is available as a variable to elements on a page.

For example, your application might store the visitor's favorite sports team in a cookie. Then, when the visitor returns, your application could retrieve the cookie and use its information to display the team logo in a banner.

When cookies are no longer needed, you can delete them.

## CookieServer

CookieServer is a servlet that sets cookies for you. You access CookieServer by creating cookies with the `satellite.cookie` tag.

## Cookie Tags

Content Server offers two tags for managing cookies:

Tag	Use
<code>satellite.cookie</code>	Sets a cookie on the client's browser.
<code>REMOVECOOKIE</code>	Deletes a cookie from the client's browser.

There is no special tag to obtain the value of a cookie. Instead, when a visitor returns to the web site, Content Server loads the value of the cookie as a regular variable.

When creating a cookie (by calling `satellite.cookie`), you can specify the following attributes:

Attribute	Value
<code>name</code>	Name of the cookie. This also serves as the name of the incoming variable containing the value of the cookie.
<code>expiration</code>	Time in seconds after which the cookie no longer is sent to the web server.
<code>security</code>	Optionally set security on the cookie.
<code>URL</code>	Restrict that the cookie only be sent on this URL
<code>Domain</code>	Restrict that the cookie only be sent to URLs in the specified domain.

Because they feel that cookies are a security threat, some visitors configure their browsers to reject cookies. If the information in the cookie is critical, your application must be prepared for this.

You must set or remove cookies before using any tags that stream content back to the visitor's browser. You must set or remove cookies even before the <HTML> tag.

### Note

Set the `xmldebug` property to `NO` before running an element that calls `REMOVECOOKIE`. If `xmldebug` is set to `YES`, `REMOVECOOKIE` does not work properly.

## Cookie Example

This example consists of five very short elements:

Element	What it Does
Start	Determines whether a cookie is set. If cookie is set, call <code>DisplayWelcome</code> . If cookie is not set, call <code>GetColorPreference</code> .
ColorForm	Displays a form that asks visitor to pick her favorite color.
CreateCookie	Creates a cookie on this visitor's browser. Then, redirects visitor to <code>DisplayWelcome</code> .
DisplayWelcome	Displays a simple welcome message in the visitor's favorite color.

### Start.xml

The `Start.xml` element determines whether the cookie has already been set. If the cookie has been set, Content Server stores its value inside a regular variable named `Variables.ColorCookie`. The code for `Start.xml` is as follows:

```
<IF COND="IsVariable.ColorCookie=true">
  <THEN>
    <CALLELEMENT NAME="CSGuide/Sessions/DisplayWelcome"/>
  </THEN>
  <ELSE>
    <CALLELEMENT NAME="CSGuide/Sessions/ColorForm"/>
  </ELSE>
</IF>
```

### ColorForm

The `ColorForm.xml` element displays some an HTML form to gather the visitor's favorite color. The code for `ColorForm.xml` is as follows:

```
<form action="ContentServer"
  method="post">
  <input type="hidden" name="pagename"
    value="CSGuide/Sessions/CreateCookie"/>
```



```

<P>What is your favorite color?</P>
<P>
<select name="FavoriteColor" size="1">
  <option>Red</option>
  <option>Green</option>
  <option>Blue</option>
</select>
</P>

<P><input type="submit" name="doit" value="Submit"/></P>
</form>

```

## CreateCookie

The `CreateCookie.xml` element sends a cookie named `ColorCookie` to the visitor's browser. If the visitor has disabled cookies, the browser ignores the request to set a cookie. If the visitor has enabled cookies (the default), the browser writes the cookie to this system's cookie file.

Th

e following is the code for `CreateCookie.xml`:

```

<satellite.cookie NAME="ColorCookie"
VALUE="Variables.FavoriteColor"
TIMEOUT="31536000" SECURE="false"/>

<CALELEMENT NAME="CSGuide/Sessions/DisplayWelcome"/>

```

The preceding code sets the value of the cookie to the visitor's favorite color. This cookie lasts for one year (31,536,000 seconds).

## DisplayWelcome

By the time `DisplayWelcome` is called, the cookie has been set. The following code uses the value of the cookie to display a welcome message in the visitor's favorite color.

```

<H1><font color="Variables.ColorCookie"
  REPLACEALL="Variables.ColorCookie">
  Displaying a Friendly Welcome.
</font></H1>

```

## Running the Cookie Example

To run the cookie example, use your browser to go to the following pagename:

```
CSGuide/Sessions/Start
```

The first time you run this example, all four elements execute. After the first time, only `Start` and `DisplayWelcome` execute.

## Tips and Tricks

The following suggestions might be useful:

- In a cluster, session state must be replicated across cluster members. In a cluster, try to keep session size to a minimum; don't store more than 2 Kilobytes of session data per client.
- Determine reasonable session timeout values. Setting timeouts that are too large tie up system resources. Setting them too small forces visitors to log in with annoying frequency.

## CS-Satellite Session Tracking

Web sites that present personalized content to visitors must track sessions. Content Server and CS-Satellite both track sessions. Both set cookies in the visitor's browser; thus, two cookies (rather than one) each independently track a session. This redundancy is useful if a CS-Satellite goes down; when a CS-Satellite goes down, the Content Server session is maintained.

## Flushing Session Information

Though CS-Satellite will only serve session-specific pagelets back to the person who originally requested them, explicitly flushing session-specific information on user logout is a wise way to conserve space in the CS-Satellite cache.

The following sections describe how to flush session information from CS-Satellite.

### Flushing a Session Via URL

You can flush all data pertaining to a particular session. You do this from Content Server by posting a form to a URL in the following format:

```
https://host:port/servlet/  
FlushServer?reset=true&username=username&password=password&  
ssid=sessionID
```

where:

Parameter	Value
host	Specify the name of the CS-Satellite host whose cache is to be flushed
port	Specify 80 (the default) unless you reconfigured Resin to run on a different port.
username	Specify the value assigned to the username property.
password	Use the value assigned to the password property.
sessionID	Specify the session ID (the one maintained by the Content Server, not the one maintained by the CS-Satellite) representing the session to be removed.

## Flushing Current Session Information

To flush the information for the CS-Satellite session that you are currently in, use the `FlushServer` URL with the current session's ID. The current session ID (ssid) is stored in a session variable with a name that is dependent upon your application server. You can see this name by looking at the session variable `HTTP_COOKIE`.

The following java code flushes the information for the current session:

```
String value;
String name = "WebLogicSession";
value = ics.GetVar(name);

String sFlushSessionUrl = "http://mysatellite:80/servlet/
    FlushServer?username=ftuser&password=ftuser&
    reset=true&ssid=" + value; "

String sSatTest1Results = Utilities.readURL(sFlushSessionUrl);
```

## Flushing Other Session Information

To flush information from a session other than the one you are in, complete the following steps:

1. Add the following tag to the container page that contains the pagelets that you want to flush:

```
<satellite.page
  pagename="QA/Satellite/Functional/xml/pagelet4"
  cachecontrol="session:0:00:00 */*/*"/>
```

The `cachecontrol` value of `"session:0:00:00 */*/*"` means that every session that requests this page creates a pagelet that can only be viewed by subsequent requests by that session. Once the session for a given page expires, that page cannot be viewed again. The container page will expire from the cache at midnight each day.

2. After setting the `cachecontrol` parameter for the container page, use the Inventory servlet with the `keys` parameter to get its session ID (ssid). The `ssid` is the string that precedes the protocol and server name. For example, if the Inventory servlet displays:

```
OuCOTrh9yporWfgu8Uthhttp://myserver:80/servlet/
ContentServer?pagename=QA/Satellite/Functional/xml/pagelet4

then the ssid is OuCOTrh9yporWfgu8U.
```

3. Flush information from the session by using the `ssid` you found with the `FlushServer` URL. For example:

```
http://myserver:80/servlet/
FlushServer?username=ftuser&password=ftuser&reset=true&
ssid=OuCOTrh9yporWfgu8U
```

### Note

You should have session affinity enabled if you want to flush information from a session other than the one you are in.



## Chapter 7

# Error Logging and Debugging

Content Server provides several options for logging error messages and debugging source code. This chapter gives you information about general error logging and debugging techniques that apply throughout the Content Server development environment. It contains the following sections:

- Overview
- Debugging Properties
- Using Error Codes with Tags
- Using the Page Debugger
- Debugging CSEE Applications

## Overview

Content Server can write information related to requests it receives to the log file `futuretense.txt`, typically located in the application server folder. For example:

```
ContentServerInstallDir/futuretense.txt
```

The log file `futuretense.txt` contains various logged messages and errors, as well as XML parse and flow information for CSEE sessions. `futuretense.txt` includes the following information:

- XML parse and runtime errors
- Element processing messages
- Conditional evaluation prints
- Variables and their values

To enable logging, start the Property Editor and set the `ft.debug` property in the `futuretense.ini` file to yes:

```
ft.debug=yes
```

To write your own error messages to the Content Server log file, use the `ics.LogMsg` Java method. The following sample code writes a message to the logfile if the `ft.debug` property is set to true.

```
// ics.LogMsg() will write to the log file whether or not ftdebug
is set to true unless you wrap it in a statement like
```

```
boolean bDebug = ftMessage.isTruestr(ics.GetProperty("ft.debug"));
if (bDebug)
    ics.logmsg("Hello");
```

By default, `ics.LogMsg` writes messages to the Content Server log file. If you want to log something to the `stdout`, use the `System.out.println` method.

You can set the maximum size (in bytes) of the log file. In a development environment, a large value is recommended.

For example, the following means the log file size will not exceed 100k bytes:

```
ft.logsize=100000
```

When the log file maximum size is reached, Content Server truncates the log file, resumes logging, and overwrites existing log file data.

See Chapter 5, “CSEE Tools and Utilities,” for information about starting the Property Editor.

Which debugging messages appear in the logfile are governed by the various debug properties. See “Debugging Properties” on page 147 for descriptions of these `futuretense.ini` properties.

#### Note

FatWire™ recommends that you enable error logging on your development or management system, but not on the delivery system. There is a significant performance setback, and the log file contains information that should not be available publicly.

## Error Log File Contents

Depending on which debug properties are set, the CSEE applications all append different messages to the `futuretense.txt` file.

### Error Logging (ft.debug=yes)

With debugging enabled (`ft.debug=yes`), Content Server logs error messages in `futuretense.txt` about XML and JSP tags. The messages are summarized here:

These lines indicate a request to Content Server, and report its version number:

```
Open Market, Inc. ContentServer 4.0.0
Copyright © 1999, 2000, 2001 Open Market, Inc. All Rights
Reserved.
Beta Kit Build
```

This line reports the component of Content Server and its build date:

```
CacheServer JumpStart 4.0 Build 43 Date: Nov 9 2001 at
09:13:57
```

This line reports the date/time the request was made:

```
Thu Dec 06 14:18:08 EST 2001
```

## HTTP Headers

These lines report incoming HTTP headers:

```
skipping non string data for [GXAgentHops]
skipping non string data for [GX_reqstart]
skipping non string data for [GXPort]
skipping non string data for [GX_exec]
adding variable[HTTP_HOST]
adding variable[PATH_INFO]
adding variable[pagename]
adding variable[SERVER_PROTOCOL]
skipping data for [gx_session_id_FutureTenseContentServer]
skipping non string data for [GXUpdateTime]
adding variable[HTTP_CONNECTION]
adding variable[REQUEST_METHOD]
skipping non string data for [GXHost]
adding variable[REMOTE_ADDR]
adding variable[HTTP_ACCEPT]
adding variable[HTTP_USER_AGENT]
skipping non string data for [GX_stream]
logging for AppLogic+FTContentServer
```

## Variable Values

These lines report default variables created and their values:

```
key:SystemAssetsRoot value:/futuretense_cs/
key:HTTP_USER_AGENT value:Java1.3.0
key:SERVER_PROTOCOL value:HTTP/1.1
key:HTTP_CONNECTION value:keep-alive
key:REQUEST_METHOD value:GET
key:QUERY_STRING value:inifile=futuretense.ini
key:SERVER_NAME value:localhost
key:REMOTE_HOST value:localhost
key:REMOTE_ADDR value:127.0.0.1
key:SERVER_PORT value:7001
key:HTTP_ACCEPT value:text/html, image/gif, image/jpeg, *;
q=.2,
    */*; q=.2
key:PATH_INFO value:/servlet/CacheServer
key:errdetail value:0
key:HTTP_HOST value:localhost:7001
key:Browser value:Unknown Browser
key:inifile value:futuretense.ini
key:errno value:0
key:HTTPS value:off
```

## Element Processing Messages

These lines indicate a call to an element. Subsequent lines are messages about processing the instructions of this element:

```
Seeding from element catalog the element:
```

```
OpenMarket/Demos/CatalogCentre/GE/Templates/blurb-  
story  
>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>Evaluating:  
OpenMarket/Demos/CatalogCentre/GE/Templates/blurb-  
story
```

These lines indicate the results of instructions for setting variables, running a query, and doing a conditional test:

```
setting tablename to :t_images
setting id to :892041205000
no orderBy clause, ok.
[false]=[false] is true
```

This line indicates that evaluation is complete for an element:

```
<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<Done:  
      OpenMarket/Demos/CatalogCentre/GE/Templates/blurb-  
story.xml
```

## XML Messages (ft.xmldebug=yes)

With XML debugging enabled (ft.xmldebug=yes), Content Server writes the XML tree structure of processed pages to the log file `futuretense.txt`. For example:

```

Parsed:
DOCUMENT
|---XMLDECL
|   +---CDATA " VERSION="1.0" "
|---WHITESPACE 0xa
|---DOCTYPE  NAME="FTCS" URL="file:///E:/APPS/
futuretense_cs.dtd"
|---WHITESPACE 0xa 0xa
|---ELEMENT FTCS  Version="1.0"
|   |---ELEMENT CSVAR  NAME="SessionVariables.myvar"
|   |---WHITESPACE 0xa
|   |---ELEMENT IF  COND="IsSessionVariable.myvar=false"
|   |   |---ELEMENT THEN
|   |       |---ELEMENT SETSSVAR  NAME="myvar" VALUE="5"
|   |       +---WHITESPACE 0xa 0x20 0x20
|   |       +---WHITESPACE 0xa
|   |---WHITESPACE 0xa 0x20 0x20 0x20 0x20
|   |---ELEMENT SETSSVAR  NAME="myfive" VALUE="5"
|   +---WHITESPACE 0xa
+---WHITESPACE 0xa

```

## Session Messages (ft.ssdebug=yes)

With session debugging enabled (`ft.ssdebug=yes`), Content Server writes the values of session variables to the log file `futuretense.txt`:

```
adding ssvariable[username] value[DefaultReader]
adding ssvariable[currentACL] value[Browser]
adding ssvariable[currentUser] value[id:DefaultReader]
```



## Time Messages (ft.timedebug=yes)

With time debugging enabled (ft.timedebug=yes), Content Server writes request performance data in the log file `futuretense.txt`.

This line indicates total time related to display of a page:

```
Execute time Hours: 0 Minutes: 0 Seconds: 2:633
```

These lines indicate processing time related to queries:

```
Executed 12 Queries in Hours: 0 Minutes: 0 Seconds: 0:500
Fetched 2 Result Sets in Hours: 0 Minutes: 0 Seconds: 0:020
```

These lines indicate processing time related to parsing elements:

```
XML Parsed 1 Templates in Hours: 0 Minutes: 0 Seconds: 1:612
XML engine ran 1 templates in Hours: 0 Minutes: 0 Seconds:
1:962
```

## Resultset Cache Messages (ft.cachedebug=yes)

With cache debugging enabled (ft.cachedebug=yes), Content Server determines when resultsets are fetched from cache and when caches are flushed, and writes this information to the log file `futuretense.txt`:

```
Table from hash...t_images
```

```
Fetched from resultset (t_images)
key:futuretense.ini-t_images-id = '892050387000'--*
```

```
Query imgQ clearing FRS due flush
Query imgQ FRS COM.FutureTense.Common.FResultSet@1f366b
```

## Page Cache Messages (ft.pgcachedebug=yes)

Controls whether Content Server should put page/pagelet caching management status messages in the `futuretense.txt` log file.

```
Error: ObjectDispatcher.Load() invalid object identifier
Variables.p
Error: ObjectDispatcher.Load() invalid object identifier
Variables.p
Parameter(s) not PageCriteria BurlingtonFinancial/AdvCols/
RecListBox
INVALID PARAM: cid=991330858149
Error: java.util.ConcurrentModificationException invoking
method SatellitePage
```

## Synchronization Messages (ft.syncdebug=yes)

Define whether Content Server logs data cache synchronization processing in the `futuretense.txt` log file.

```
SiteCatalog cache timeout absolute:false
SiteCatalog syncing cache:true
SiteCatalog cache timeout absolute:false
SiteCatalog syncing cache:true
Recording item 968685129142
```

```
Warning missing WHAT converted to * for catalog SitePlanTree
SystemEvents cache timeout absolute:false
SystemEvents syncing cache:true
Grabbing SystemEvents
```

## Browser-Based Logging (ft.dbl=yes)

With browser-based logging enabled (`ft.dbl=yes`), Content Server logs messages for a specific IP address in a log file named `futuretense_client_ip_address.txt` in the application server installation directory.

With browser-based logging disabled (`ft.dbl=no`), all debug messages go into the log file `futuretense.txt`.

When many users are developing on a single system, this feature isolates the requests from a single client machine, thus simplifying the process of tracking information associated with a request.

You can easily display the log for a specific IP address in a browser by using the CatalogManager command, `exportlog`.

To view the log file from a browser:

1. Use the Property Editor to set the `ft.dbl` property to `yes`.
2. Use your browser to go to the following URL (on the iPlanet Application Server):  
`http://host:port/NASApp/cs/CatalogManager?ftcmd=exportlog`  
or to the following URL (on a servlet engine, including Sun ONE Application Server):  
`http://host:port/servlet/CatalogManager?ftcmd=exportlog`

## Additional Error Message Locations

Java run-time output provides messages and database debug messages, including:

- Stack traces for unhandled exceptions.
- Database SQL statements and errors.

Some XML tag exceptions can appear in your browser's page source window. Misspelled or erroneous tag names appear in the browser source window as text. Normal tags are processed by Content Server and replaced by generated HTML.

You can also add print statements to your source code, as shown below:

- XML code: `<CSVAR NAME="..." />`
- Java code: `System.out.println("...");`

`Variables.errno` and `Variables.errdetail` can contain useful information. For more about `Variables.errno`, see "Using Error Codes with Tags" on page 149.

You can also find helpful information in the following additional locations:

## Browser Error Messages

The browser window displays error messages, which unfortunately can be somewhat cryptic. You can also use your browser to view source code, but remember that the browser shows the generated HTML, not the original XML.

## Application Server Log Files

Read the documentation for your application server to determine the location of any application server log files.

## XML Syntax and Runtime Error Checking

The XML parser that processes Content Server tags ensures that the tags are syntactically correct. This simplifies tracking down hard-to-find problems related to tagging syntax errors. However, the XML parser does not report misspelled tag names as errors, because not all tag names are required to exist in the DTD.

When a page request is made to Content Server and an XML syntax error is detected, the results streamed back contain information that can help you locate the problem. A general error description is given, followed by the offending line or column location:

This error reports a bad parameter name:

```
Illegal attribute name NAM Illegal attribute name NAM
Location: null(6,11)
Context:
```

This error reports an incorrect tag nesting:

```
Close tag IF does not match start tag THEN Close tag
    IF does not match start tag THEN
Location: null(13,3)
Context:
```

The XML parser also detects run-time errors, where the XML tags are syntactically correct, but some structural error is detected during processing. For example, this error reports an invalid use of Argument:

```
Failed to run template:c:\FutureTense\elements\dan.xml
Runtime error Argument invalid
[Argument 5]
Containing tag: FTCS
```

## Debugging Properties

To debug Content Server source code, set the properties in the `futuretense.ini` file, as shown in the following example. These are a few of the most commonly used properties for Content Server debugging. Your own property settings depend on your specific debugging requirements.

```
ft.debug=yes
ft.dbdebug=yes
ft.xmldebug=yes
ft.logsize=100000
cs.timeout=30000
```

The following table describes all debugging properties in the `futuretense.ini` file. (All of these properties are on the **Debug** tab in the Property Editor except for `thecs.timeout`, which is on the **IPS** tab.)

Property	Value	Description
<code>ft.debug</code>	yes   no (default)	If yes, Content Server adds debug messages to the log file <code>futuretense.txt</code>
<code>ft.dbdebug</code>	yes   no (default)	If yes, Content Server adds database debug messages to <code>uturetense.txt</code> and also to the standard output log file.
<code>ft.xmldebug</code>	yes   no (default)	If yes, Content Server adds XML evaluation messages to <code>futuretense.txt</code>
<code>ft.logsize</code>	n (in bytes; default is 10000)	Specifies the maximum size, in bytes, of the output log. FatWire™ recommends a large value (for example, 100000).
<code>cs.timeout</code>	n (in seconds; default is 300)	Specifies the maximum connection idle time before Content Server terminates the connection. FatWire™ recommends a large value (for example, 30000) so you can maintain context while debugging.
<code>ft.ssdebug</code>	yes   no (default)	If yes, Content Server adds session-specific debug messages to the log file <code>futuretense.txt</code> .
<code>ft.timeddebug</code>	yes   no (default)	If yes, Content Server adds messages about evaluation timing to the log file <code>futuretense.txt</code> .
<code>ft.evaldebug</code>	yes   no (default)	If yes, Content Server includes diagnostic messages about EvalServer service to the log file <code>futuretense.txt</code> .
<code>ft.cacheddebug</code>	yes   no (default)	If yes, Content Server adds messages about cache management status to the log file <code>futuretense.txt</code> .
<code>ft.pgcacheddebug</code>	yes   no (default)	If yes, Content Server adds page and pagelet caching management status messages to the log file <code>futuretense.txt</code> .
<code>ft.debugport</code>	n (default is 1025)	The port that the debug server uses to communicate with the template debugger.
<code>ft.syncdebug</code>	yes   no (default)	If yes, Content Server logs datacache synchronization processing.
<code>ft.eventdebug</code>	yes   no (default)	If yes, Content Server logs event management processing.

Property	Value	Description
<code>ft.dbl</code>	yes   no (default)	If yes, enables browser-based retrieval of a log file with debug messages. The file <code>futuretense_client_ip_address.txt</code> is created in the application server installation directory.  If no, browser-based retrieval is disabled, and all debug messages go into the log file <code>futuretense.txt</code> .
<code>verity.debug</code>	yes   no (default)	If yes, the Verity search engine adds debug messages to the log file <code>futuretense.txt</code> .

For information about all other property settings in the `futuretense.ini` file, see the *CSEE Administrator's Guide*.

#### Note

Because enabling any debugging property can affect performance, you should not set any of the debug properties if you are doing performance testing.

## Using Error Codes with Tags

Content Server has a reserved variable named `Variables.errno` which most JSP and XML tags use for returning an error code (generally referred to as an **errno**) if the tag did not successfully complete its task.

For example, the `<CALLELEMENT>` XML tag sets `Variables.errno` as follows:

- -10 if you specified a nonexistent element.
- -12 if you specified an existing element that Content Server could not evaluate.

On success, `<CALLELEMENT>` does not modify the value of `Variables.errno`.

#### Note

For revision tracking operations, the reserved variable named `Variable.errdetails` provides additional information about the error.

You typically use the following strategy with tags that use `Variables.errno`:

1. Initialize `Variables.errno` to 0 before calling the tag.
2. Call the tag.
3. Evaluate `Variables.errno`.

## Tag Examples Using Error Codes

For example, the following code performs all three steps:

```
<SETVAR NAME="errno" VALUE="0" />
<SETCOUNTER NAME="pi" VALUE="3.14159" />
<IF COND="Variables.errno=-501">
  <THEN>
    <p>Bad value of pi</p>
  </THEN>
</IF>
```

Running this code yields the following HTML because SETCOUNTER cannot handle floating-point values:

```
<p>Bad value of pi</p>
```

The ASSET, RENDER, and SITEPLAN tags clear errno before they execute. You do not need to set errno to 0 when you use these tags. For example, after you use an ASSET tag, just check the value of errno to determine whether it has changed:

```
<ASSET.LOAD NAME="topArticle" TYPE="Article"
OBJECTID="Variables.cid" />
<IF COND="IsError.Variables.errno=false">
  <THEN>
    <ASSET.CHILDREN NAME="topArticle"
      LIST="listOfChildren" />
  </THEN>
</IF>
```

At the end of CS-Direct template elements, you can include error checking code such as this:

```
<IF rendermode="preview">
  <THEN>
    <IF COND="IsError.Variable.errno=true">

      <THEN>
        <FONT COLOR="#FF0000">
          Error <CSVAR NAME="Variables.errno" />
          while rendering <CSVAR NAME="pagename" />
          with asset ID <CSVAR NAME="Variables.cid" />.</
        <FONT>
      </THEN>
    </IF>
  </THEN>
</IF>
```

### Java Interface

After making calls to Content Server, the String variable errno can be retrieved and tested for success or failure. Here's an example:

```
cs.clearErrno();
IList rsIt = cs.SelectTo(SYSTEMUSERS_TABLE, ALL_FIELDS,
  USERNAME,
    null, NO_LIMIT, null, CACHE_RESULTS, errstr);
errno = cs.GetVar("errno");
```

```

if (errno.compareTo(ERRNO_SUCCESS) == 0)
{
    ...
}

```

## Error Number Rules

Error numbers are always integers. The following table briefly summarizes error numbering rules for `Variables.errno`.

See the *CSEE Developer's Tag Reference* for specific error numbers for each tag.

Number	Significance
Negative integers	Failure
0 (zero)	Success
Positive integers in a tag other than a revision tracking tag.	Information
Positive integers in a revision tracking tag.	Failure

## Using the Page Debugger

The Page Debugger is a CSEE tool that lets you step through the execution of XML and JSP elements. You can view the values of variables as the element executes, and more easily determine where errors occur in your code.

The Page Debugger is installed when you install Content Server using the **Single Server with Page Debugger** option. If you do not have the Page Debugger, you can install it by upgrading your existing installation. To do so, run the Content Server upgrade script and select the **Upgrade with Page Debugger** option.

FatWire recommends that you install the Page Debugger on your development system only.

## Invoking the Page Debugger

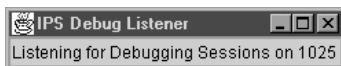
Invoking the Page Debugger is a two-step process:

1. Start the Debug Listener.
2. Alter the URL that invokes a page.

### Start the Debug Listener

Before running the Page Debugger, you must first start the **Debug Listener**. To start the Debug Listener, run the `DebugListener.bat` file.

The following Debug Listener window appears:



By default, the Debug Listener runs on port 1025. If you want to run the Debug Listener on another port (for example, because another service is already using port 1025), then do both of the following:

- Use the Property Editor to change the `ft.debugport` setting to your chosen port number; for example, 2025.
- On the Debug Listener invocation line, use the `-p` option, followed by a space and then the port number. For example:

```
java -classpath cs.jar  
COM.FutureTense.Apps.DebugListener -p 2025
```

## Alter the URL that Invokes a Page

With Debug Listener running, use your Web browser to request the page to be debugged. In the browser's **address** field, replace the phrase `ContentServer` with `DebugServer`. The page is then requested through the Page Debugger instead of Content Server.

### Note

The Debug Listener and the browser that you use to make the page request to the `DebugServer` must be on the same machine.

If you are running iPlanet Application Server, replace the following address:

```
http://host:port/NASApp/CS/ContentServer?pagename=xxx
```

with this address:

```
http://host:port/NASApp/CS/DebugServer?pagename=xxx
```

If you are running WebLogic or WebSphere, replace the following address:

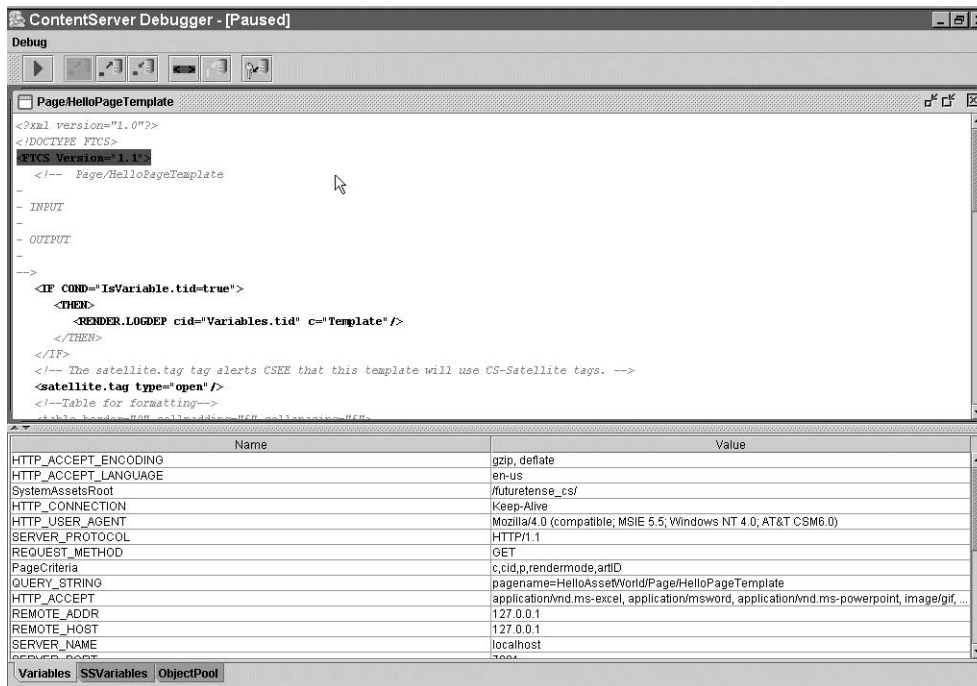
```
http://host:port/servlet/ContentServer?pagename=xxx
```

with this address:

```
http://host:port/servlet/DebugServer?pagename=xxx
```



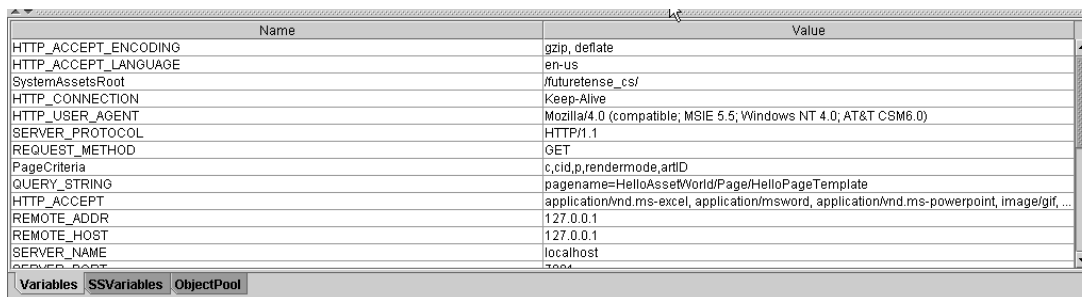
The Debugger main window appears:



The tabs in the bottom pane of Page Debugger's window provide the following information:

- Names of variables and their values
- The names and values of objects in the object pool
- The state of all session variables and their values

In the following examples, the Page Debugger windows display information about session variables, objects, and variables:



The **Variables** window displays the names and values of the variables that are used in the element that you are currently debugging.

Name	Value
currentUserPassword	89160b17930d178ec9e55651ad599c59cfd78d49d3f80149
currentUser	2
currentACL	Visitor,Browser
username	DefaultReader

Variables SSVariables ObjectPool

The **SSVariable** window shows the names and values of all the session variables in the element that you are currently debugging.

Name	Value
COM.FutureTense.Interfaces.ItemList	COM.FutureTense.Export.ItemList@333d0a

Variables SSVariables ObjectPool

The **ObjectPool** window shows the names and values of all of the objects in the object pool.

## Page Debugger Commands

The Page Debugger has the following commands:

- Continue to Next Breakpoint
- Step Into
- Step Over
- Step Out
- Toggle Breakpoint
- Continue to Cursor
- Done

To choose a command, click the buttons in the Page Debugger button bar, or choose any of the following commands from the **Debug** menu:

### Continue to Next Breakpoint



Use **Continue to Next Breakpoint** to continue to the next breakpoint that you have set using the **Toggle Breakpoint** button.

Note that you cannot set breakpoints until you start a debugging session; as a result, you cannot use the **Continue to Next Breakpoint** button to step through an element the first time you debug it.

For example, the first time you debug a page, you have to step through it manually, setting breakpoints as you go. If you refresh the page to debug it again, the breakpoints you set will be there, and you can use the **Continue to Next Breakpoint** button to step through the element.

Breakpoints do not persist between sessions of the DebugListener.

## Step Into



Use **Step Into** to open the element called by the element that you are currently debugging.

To use the **Step Into** function, select the CALLELEMENT tag and click the **Step Into** button. In the following example, the element being called is used to display the date to a visitor who is logged in to the site:

```

</THEN>
<ELSE><!-- first time for this user --> Hi new user. <SETSSVAR NAME="beenhere"
VALUE="true" />
</ELSE>
</IF>
<br/>
<CALLELEMENT NAME="FutureTense/Demos/Movie/movie/date" />
<!-- Dump the list of movies: select
-- from the movie catalog and loop thru
-->
<SETVAR NAME="errno" VALUE="0" />
<SETVAR NAME="isChild" VALUE="false" />
<USERISMEMBER GROUP="Child" />

```

The following window appears:

```

<?XML VERSION="1.0" ?>
<!DOCTYPE FTCS>
<FTCS Version="1.0">
  <!-- deal with session timeout -->
  <IF COND="IsSessionVariable.logintime=true">
    <THEN> Connected at <CSVAR NAME="SessionVariables.logintime" />
    <br/>
  </THEN>
  </IF>
</FTCS>

```

## Step Over



Use **Step Over** to move from the currently highlighted tag to the next tag in the element, without executing any elements that are called in between the tags.

## Step Out



Use **Step Out** to step out of the elements currently opened by the Page Debugger. If you have opened an element as a result of using the **Step Into** command, use **Step Out** to return to the original Page Debugger file from which you opened the element.

You can also use **Step Out** to exit the original element that you opened with the Page Debugger.

## Toggle Breakpoint



Use the **Toggle Breakpoint** button to set or remove breakpoints in the elements you have opened in Page Debugger.

For more information about breakpoints, see the “Continue to Next Breakpoint” section of this chapter.

## Continue to Cursor



Use **Continue to Cursor** to select a location within the element where you want the Page Debugger to move to next. To check a specific tag located in the middle of the element, complete the following steps:

1. Use the cursor to select part of the tag.
2. Click **Continue To Cursor**.

The Page Debugger highlights the tag that you selected with your cursor.

### Note

You must select at least one text character or space in the tag for **Continue To Cursor** to work. It does not work if you simply place the cursor within the tag.

## Done



Use **Done** to complete the Page Debugger session and exit the file. When you click **Done**, the Page Debugger moves through the entire file, listing all information in the bottom window of the Page Debugger main view.

## Debugging CSEE Applications

This section provides some debugging and error logging information for developers using other CSEE products. It contains the following sections:

- Debugging Content Server Engage
- Error Logging on CS-Satellite
- Error Logging on Analysis Connector

### Debugging Content Server Engage

During your development phase, you must verify that session linking is set up correctly, that specific attributes obtain the value that you expect, and that recommendations return the items that you expect. There are several Content Server Engage object methods that you can use to retrieve and review information and values by writing information to a browser window or to the JRE log, or by examining it with the Page Debugger utility.

This section lists the Commerce Connector and Visitor Data Manager object methods that you will probably use the most. For information about these and any other XML and JSP object methods, see the *CSEE Developer's Tag Reference*.

### Session Links

Use the following Visitor Data Manager object methods to verify that pages that handle session linking are creating the aliases correctly:

- `<VDM.GETALIAS KEY="keyvalue" VARNAME="varname"/>` retrieves an alias.
- `<VDM.GETCOMMERCEID VARNAME="varname"/>` retrieves the visitor's Transact commerce ID from session data.
- `<VDM.GETACCESSID KEY="pluginname" VARNAME="varname"/>` retrieves the visitor's access ID from session data.

### Visitor Data Collection

Use the following Visitor Data Manager object methods to retrieve and examine values stored for specific visitor attributes, history attributes, and history types (records):

- `<VDM.GETSCALAR ATTRIBUTE="attribute" VARNAME="varname"/>` retrieves a specific visitor attribute.
- `<VDM.LOADSCALAROBJECT ATTRIBUTE="attribute" VARNAME="varname"/>` retrieves (materializes) an object stored as a visitor attribute of type binary.
- `<VDM.GETHISTORYCOUNT ATTRIBUTE="attribute" VARNAME="varname" [STARTDATE="date1" ENDDATE="date2" LIST="constraints"]/>` retrieves the number of history type records that were recorded for the visitor that match the specified criteria.
- `<VDM.GETHISTORYSUM ATTRIBUTE="attribute" VARNAME="varname" [STARTDATE="date1" ENDDATE="date2" LIST="constraints"] FIELD="fieldname"/>` sums the entries in a specific field for the specified history type.

- `<VDM.GETHISTORYEARLIEST VARNAME="varname" [ STARTDATE="date1" ENDDATE="date2" LIST="constraints" ] />` retrieves the timestamp of the first time the specified history type was recorded for this visitor.
- `<VDM.GETHISTORYLATEST VARNAME="varname" [ STARTDATE="date1" ENDDATE="date2" LIST="constraints" ] />` retrieves the timestamp of the last time (that is, the most recent time) the specified history type was recorded for this visitor.

## Recommendations and Promotions

Use the following Commerce Context object methods to verify pages that display recommendations and promotions:

- `<COMMERCECONTEXT.CALCULATESEGMENTS/>` lists the segments that the visitor belongs to. It examines the available visitor data, compares it to the data types that define the segments, and then lists the segments that are a match.
- `<COMMERCECONTEXT.GETPROMOTIONS LISTVARNAME="promotionlist"/>` creates the list of promotions that the current visitor is eligible for
- `<COMMERCECONTEXT.GETRATINGS ASSETS="assetlist" LISTVARNAME="ratinglist" DEFAULTRATING="defaultrating"/>` calculates the ratings of the assets in a named list according to how important the asset is to this visitor based on the segments that the visitor belongs to.
- `<COMMERCECONTEXT.GETSEGMENTS LISTVARNAME="segmentlist"/>` retrieves the list of segments that the current visitor belongs to.

## Verifying Visitor Data Assets

To determine that you correctly set up your visitor attributes, history attributes, and history types, examine the Segment Filtering forms and decide whether the visitor assets that you created were configured correctly:

- Create segments that use each of the visitor attributes and history types that you created.
- Determine that the constraint types are correct and that the input ranges are accepting the correct range of input.

For help with creating segments, see the *CSEE User's Guide*.

## Verifying Recommendation Assets

To verify that you configured your recommendation assets correctly, complete the following kinds of exercises:

- Create some test segments.
- In the product and product group forms, assign ratings for the segments.
- Browse your site as a visitor and register yourself so that you qualify for the test segment.
- Examine the items that the recommendation assets return.
- If you find problems, use the Content Server Engage XML or JSP object methods to write test pages that isolate the problem.

## Error Logging on CS-Satellite

Resin writes access information and error information to a log file at the following path name:

```
$SatelliteRoot/omkt/resin1.1/log
```

CS-Satellite logs access and error information to standard output.

There are five categories of messages that go into the log:

- Startup messages are logged when the CS-Satellite servlets are starting up.
- Property messages are logged when CS-Satellite properties and property values are loading.
- Cache event messages are logged when pages or pagelets are removed from the cache.
- Debug messages are logged if the `Caching.cache_debug` property is set to `true`.
- Other

The following tables describe some common Startup messages and Property messages:

### Startup Messages

Message Text	Meaning
FileServer	The FileServer servlet has been started.
Satellite	The Satellite servlet has been started.
FatWire CS-Satellite 5.0 Copyright © 2002 FatWire, Inc. All Rights Reserved. Build 2574 Date: Nov. 19 2002 at 16:19:00	Copyright notice.
Bootup Complete.	The servlet has booted.

### Property Messages

Message Text	Meaning
Loading properties from: c:\satellite\omkt\satellite\satellite.ini	The satellite.ini file has been read.
Cache max error	Error loading the <code>Caching.cache_max</code> property.
Cache check time error	Error loading the <code>Caching.cache_check_interval</code> property.
Time pattern error	Error loading the <code>Caching.expiration</code> property.

Message Text	Meaning
Read timeout error	Error loading the <code>Configuration.readtimeout</code> property.
Block timeout error	Error loading the <code>Configuration.blocktimeout</code> property.
Refresh time error	Error loading the <code>Configuration.control_refresh_interval</code> property.
File size error	Error loading the <code>Caching.file_size</code> property.
Cache max size:	The <code>Caching.cache_max</code> property value has been loaded.
Cache check interval:	Error loading the <code>Caching.cache_check_interval</code> property value.
host <Host:Port>	The <code>Remote Host.host</code> property value has been loaded.
Default fragment expiration:	The <code>Caching.expiration</code> property value has been loaded.
Socket timeout value:	The <code>Configuration.readtimeout</code> property value has been loaded.
Thread block time:	The <code>Configuration.blocktimeout</code> property value has been loaded.

## Error Logging on Analysis Connector

Analysis Connector error messages are logged to the Java logs; they are not displayed in the browser. Consequently, you should test the entire process— from table creation to requesting output—to ensure proper setup. For example, when capturing data (`CMD.WRITECOMMERCE`DATA), Analysis Connector writes an error message to the Java logs if the named table does not exist. You know this only if you check the logs.

Similarly, when capturing data, `CMD.WRITECOMMERCE`DATA requires that a parameter be specified for each column in the named table, including columns that accept `NULL` values. An error condition results if all columns are not accounted for. `NULL` values must be represented as `colname="0"`; if `colname=" "` is specified, the tag substitutes zero. FatWire™ recommends that you do not use `NULL` columns.

Make sure the data types declared in a new table definition are accepted by the database. This is a typical cause of table creation failure. Likewise, you need to make sure that the data you try to capture with the `CMD.WRITECOMMERCE`DATA tag is consistent with the data types of the columns to which this data is written.



## Section 3

# Data Design

This section describes the Content Server database and explains how to design the data (assets) that your CSEE system delivers.

It contains the following chapters:

- Chapter 8, “Data Design: The Asset Models”
- Chapter 9, “The CSEE Site”
- Chapter 10, “The Content Server Database”
- Chapter 11, “Managing Data in Non-Asset Tables”
- Chapter 12, “Resultset Caching and Queries”
- Chapter 13, “Designing Basic Asset Types”
- Chapter 14, “Designing Flex Asset Types”
- Chapter 15, “Designing Attribute Editors”
- Chapter 16, “Importing Assets”
- Chapter 17, “Importing Flex Assets”
- Chapter 18, “Importing Flex Assets with the BulkLoader Utility”



## Chapter 8

# Data Design: The Asset Models

The Content Server servlets are the operating system that runs your CSEE content management system—but the Content Server database is the brains of the system. It stores the system information that makes the CSEE applications run, the content that you are using the CSEE applications to manage (that is, assets), and the structural information that provides the format and business logic for displaying your content to the visitors of your online sites.

For the most part, data design means asset design. However, developers frequently need to create tables that hold supporting data for their assets. Determining the need for those tables and then designing them is also a part of data design.

This chapter contains the following sections:

- Asset Types and Asset Models
- The Basic Asset Model
- The Flex Asset Model
- Search Engines and the Two Asset Models
- Tags and the Two Asset Models
- Summary: Basic and Flex Asset Models

Designing and creating tables that do not hold assets is discussed in Chapter 10, “The Content Server Database.”

## Asset Types and Asset Models

An **asset** is an object that is stored in the Content Server database, an object that can be created, edited, inspected, deleted, duplicated, placed into workflow, tracked through revision tracking, searched for, and published to your delivery (live) site.

An **asset type** is a definition or specification that determines the characteristics of asset objects of that type.

Developers design and create asset types while designing your content management system and your online sites. Content providers then create and edit assets of those types

In general, assets perform one of the following three roles:

- Provide **content** that visitors read and examine on your online sites
- Provide the **formatting** logic or code for displaying the content
- Provide **data structure** for storing the content in the Content Server database

The developer's job is to design asset types that are easy for content providers to work with on the management system and that can be delivered efficiently to visitors from the delivery system.

## Two Data Models

The CSEE products provide two data models for the assets types that you design: **basic** and **flex**.

- **Basic** asset types have a **simple data structure**: they have one primary storage table and simple parent-child relationships with each other.

The basic asset model is delivered with CS-Direct.

Basic asset types are separate, standalone asset types that represent individual kinds of content: an article, an image file, a page, a query, and so on. You use the AssetMaker utility (located on the **Admin** tab in the Content Server interface when CS-Direct is installed) to create new basic asset types.

- **Flex** asset types have a **complex data structure** with several database tables and the ability to support many more fields than do basic asset types. Additionally, they can have more than one parent, any number of grandparents, and so on, that they can **inherit** attribute values from.

The flex asset model is delivered with CS-Direct Advantage only. You cannot create flex asset types with CS-Direct.

Flex asset types comprise families of asset types that define each other and assign attribute values to each other. You use the Flex Family Maker utility (located on the **Admin** tab in addition to the AssetMaker utility when you have CS-Direct Advantage installed) to create a family of flex asset types.

## Default (Core) Asset Types

There are several core asset types delivered by the CS content applications. Because CSEE has a stack architecture, the core asset types are made available as follows:

- CS-Direct delivers the template, query, collection, SiteEntry, CSElement, Link, and page asset types. All of the other content applications use the template and page asset types.

- CS-Direct Advantage delivers the attribute editor asset type. It supports any flex attribute asset types that you create.
- CS-Engage delivers the visitor attribute, history attribute, history definition, segment, recommendation, and promotion asset types.

Assets of these types provide format or logic for the display of asset types that hold your content by retrieving, ordering, organizing, and formatting those assets. In other words, you use the core asset types to organize and format the content on your online site.

## CS-Direct

The core asset types delivered with CS-Direct provide basic site design logic. You can create as many individual assets of these types as you need, but you cannot modify the asset types themselves:

- **Query** stores queries that retrieve a list of assets based on selected parameters or criteria. You use query assets in page assets, collections, and recommendations. The database query can be either written directly in the **New** or **Edit** form for the query asset as a SQL query, or written in an element (with Content Server query tags or as a search engine query) that is identified in the **New** or **Edit** form.
- **Collection** stores an ordered list of assets of one type. You “build” collections by running one or more queries, selecting items from their resultsets, and then ranking (ordering) the items that you selected. This ranked, ordered list is the collection. For example, you could rank a collection of articles about politics so that the article about last night’s election results is number one.
- **Page** stores references to other assets. Arranging and designing page assets is how you represent the organization or design of your site. You design page assets by selecting the appropriate collections, articles, imagefiles, queries, and so on for them. Then, you position your page assets on the **Site Plan** tab that represents your site in the tree on the left side of the Content Server interface.

Note that a page asset and a Content Server page are quite different. The page asset is an organizational construct that you use in the Site Plan tab as a site design aid and that you use to identify data in your elements. A Content Server page is a rendered page that is displayed in a browser or by some other mechanism.

- **Template** stores code (XML or JSP and Java) that renders other assets into Content Server pages and pagelets. Developers code a standard set of templates for each asset type (other than CSElement and SiteEntry) so that all assets of the same type are formatted in the same way.

Content providers can select templates for previewing their content assets without having access to the code itself or being required to code.

- **CSElement** stores code (XML or JSP and Java) does not render assets. Typically, you use CSElements for common code that you want to call from more than one template (a banner perhaps). You also use CSElements to provide the queries that are needed to create DynamicList recommendations in CS-Engage.
- **SiteEntry** represents a Content Server page or pagelet and has a CSElement assigned as the root element that generates the page. Template assets do not have associated SiteEntry assets because they represent both an element and a Content Server page.
- **Link** stores a URL to an external web site. You use this asset to embed an external link within another asset.

Because the data needs of each organization using a CSEE content management system are different, there are no default asset types that represent content. However, the sample sites deliver sample content asset types that you can examine and modify for use on your sites.

## CS-Direct Advantage

There is one core asset type in the CS-Direct Advantage application: **attribute editor**.

An attribute editor specifies how data is entered for a flex attribute when that attribute is displayed on a **New** or **Edit** form for a flex asset or a flex parent asset. It is similar to a template asset. However, unlike a template asset, you use it to identify the code that you want CS-Direct Advantage to use when it displays an attribute in the Content Server interface—not when it displays the value of an attribute on your online site.

## CS-Engage

The CS-Engage application delivers several core asset types that you use to gather visitor information so that you can personalize the product placements and promotional offerings that are displayed for each visitor:

- **Visitor attribute** holds types of information that specify one characteristic only (scalar values). For example, you can create visitor attributes named “years of experience,” “job title,” or “number of children.”
- **History attributes** are individual information types that you group together to create a vector of information that CS-Engage treats as a single record. This vector of data is the **history definition**. For example, a history type called “purchases” can consist of the history attributes “SKU,” “itemname,” “quantity,” and “price.”
- **Segments** are assets that divide visitors into groups based on common characteristics (visitor attributes and history types). You build segments by determining which visitor data assets to base them on and then setting qualifying values for those criteria. For example, a segment could define people who live in Alaska and own fly fishing gear, or it could define people who bought a personal computer in the past six months, and so on.

After you define and categorize the visitor data that you want to collect, you use the following asset types to select, organize, and display the flex assets that represent your content on your online site:

- **Recommendation** is something like an advanced collection. It collects, assesses, and sorts flex assets (products or articles, perhaps) and then recommends the most appropriate ones for the current visitor, based on the segments that visitor belongs to.
- **Promotion** is a merchandising asset that offers some type of value or discount to your site visitors based on the flex assets (products, perhaps) that the visitor is buying and the segments that the visitor qualifies for.

### Note

CS-Engage interacts with assets that are built using the **flex asset model only**. You cannot program recommendations and promotions to work with assets that use the basic asset model.

## Which Asset Model Should You Use to Represent Your Content?

During the process of designing your online site with the CSEE content management system, you and others on your team create the asset types that you need to represent the content for your site. The CS-Direct template and page asset types provide the formatting framework for the asset types that represent your data, whether you use the basic data model or the flex data model.

The asset data model (basic or flex) that you should choose to represent the data that you want to display on your online site depends on the nature of that data, as described in the following two sections.

### When to Use the Basic Model

The basic model is a good choice when your data has the following characteristics:

- It is fixed, predictable: there will be no need to add attributes to the asset type.
- It is homogenous: all assets of the same type have similar attributes.
- It has a moderate number of attributes. You are limited by your database as to how many columns/attributes you can have in the asset type table for a basic asset.
- You want to use the Export to Disk publishing method. There are very limited applications of the flex asset model in which it makes sense to use the Export to Disk publishing method.
- Visitors browse your online site by navigating from link to link.

When the data for an asset type can be imagined as a spreadsheet, as a simple flat table where each asset of that type is a single record and every record has the same columns, that asset type should use the basic asset model.

### When to Use the Flex Model

The flex model is the right choice when your data has the following characteristics:

- It has lots of attributes. For example, products can have potentially hundreds of attributes. Because attribute values for the flex family member are stored as rows rather than columns, flex assets can physically have many more attributes than basic assets can.
- It can be represented in a hierarchy in which assets inherit attribute values from parent assets.
- You cannot predict what attributes might be necessary in the future and your data might need additional attributes periodically.
- Asset instances of the same type can vary widely. That is, not all assets of that type should have the same attributes. For example, a bath towel product asset would have attributes that a toaster product asset would not, but both the bath towel and the toaster are product assets.
- Visitors browse your online site by navigating through “drill-down” searches that are based on the attribute values of your data.
- You want to use CS-Engage.

For example, products fit into the flex asset model because markets are constantly changing. You cannot always predict what products you will be selling next year or what attributes those products will have.

If your business needs will require you to make modifications to your asset types such as adding or changing their attributes, the flex data model is probably the right choice for you. The flex asset model gives you the extensibility that you need to represent data whose characteristics cannot be predicted.

## The Basic Asset Model

CS-Direct delivers the basic asset model. In general, the data model for basic asset types is one database table per asset type. All basic assets of the same type have the exact same fields (properties) and all assets of a single type are stored in the same database table.

Most of the core CS-Direct asset types use the basic data model.

To create new basic asset types, you use the AssetMaker utility. You code XML files called **asset descriptor files** using a custom tag named `PROPERTY` and then upload the file with AssetMaker. A **property** is both a column and a field. A `PROPERTY` statement defines a column in the table that stores assets of that type and defines how data is to be entered into the corresponding field for that column in the CS-Direct forms.

For information about coding asset descriptor files and creating new basic asset types, see Chapter 13, “Designing Basic Asset Types.”

## Basic Asset Types from the Burlington Financial Sample Site

If you installed the Burlington Financial sample site, CS-Direct installed five asset types that represent content. These sample site asset types use the basic asset model delivered with CS-Direct:

- **Article** stores the text of an article and information about it. It has fields for headline, byline, credit line, body, and so on. Note that this is a custom asset type that was **not created with AssetMaker**.
- **ImageFile** stores an image file as an uploaded binary large object (blob). These image files can be associated with other assets such as a page or an article. This asset type was created with AssetMaker.

This sample site also provides an example of how you can create additional formatting asset types, if necessary, with the following asset type:

- **StyleSheet** stores style sheet files of any format (CSS, XSL, and so on). You create the style sheet in a text editor and then upload it into CS-Direct as a style sheet asset. When you store style sheets as assets, you can assign a workflow to them, use revision tracking, and so on. This asset type was created with AssetMaker.

Burlington Financial installs the following asset types, but does not use them:

- **Linkset** stores a group of links to either the URLs of related assets or the URLs of external Web sites. Assets of this type can be associated with other assets like a page or an article.
- **Image** stores the URL for an image file that can be associated with other assets like a page or an article.

These asset types were used by a previous sample site. They are included with the 4.0 version of the CS-Direct application for backward compatibility.



## Relationships Between Basic Assets

Basic asset types have very simple parent-child relationships. You use these relationships to associate or link assets to each other. Then, when you design the online pages for your online sites you code template elements that identify, extract, and then display an asset's children or parent assets in appropriate ways.

The relationships that basic assets can have with each other are called **named associations** and **unnamed relationships**. When these relationships occur between individual assets, they are written to the `AssetRelationTree` table.

### Named Associations

Named associations are defined, asset-type-specific relationships that are represented as fields in the CS-Direct asset forms. After you create an asset type with AssetMaker, you use the **Association** form for that asset type to create association fields.

You use named associations to set up relationships that make sense for the asset types in your system and then you use the names of these relationships to identify the related assets and display them in appropriate ways on your site pages.

For example, the Burlington Financial sample asset named article has three named associations with the imagefile asset type: Main ImageFile, Teaser ImageFile, and SpotImageFile. The Burlington Financial article templates are coded to display the imagefiles that are linked to articles through these associations. The association is what enables the template to determine which imagefile is the correct one to display for an individual article asset.

When a content provider selects an image asset in the **Main Image** field of the **New** and **Edit** article forms, the selected imagefile asset becomes a child of the article asset. (Note that this same imagefile asset can also be a child of other articles.)

When you create a new named association between asset types, CS-Direct creates a row for that type of association in the `Association` table. Then, when you create an asset and specify the name of another asset in an association field, that relationship is written to the `AssetRelationTree` table.

### Unnamed Relationships

Unnamed relationships occur in the following situations:

- When you build a collection, the items in the collection become children of the collection.
- When you select queries or other assets for page assets from the tree, which places them in the **Contains** list box, on the **New** and **Edit** forms for page assets, those assets become children of the page asset.

Neither of these relationships is identified by a name.

The Burlington Financial sample site has two page assets with an unnamed relationship set up through that page asset's **Candidates** list. The About Us article placed on the About page asset has an unnamed relationship to the About page asset. The article is a child of the page asset. Additionally, the Contact Us article placed on the Contact page asset has an unnamed relationship to the Contact page asset.

Because there is no name for these kinds of relationships, CS-Direct does not create rows in the `Association` table for them. However, the individual instances of these unnamed associations are written to the `AssetRelationTree` table.

## Category, Source, and Subtype

There are three additional ways to organize or categorize basic assets: category, source, and subtype. Categories and subtypes are specific to an asset type. Source, however, applies to all the asset types in a CSEE site. In other words, source is site-specific.

### Category

`Category` is a default column and field that you can use to categorize assets according to a convention that works for your sites. Although all basic asset types have a `category` column by default, you do not have to use it (it is not a required field).

For example, the Burlington Financial sample site has categories named Personal Finance, Banking and Loans, Rates and Bonds, News, and so on. Articles identified with these categories are selected by queries that use category as a selection criterion and displayed on specific site pages, as appropriate.

When you create a new basic asset type, AssetMaker creates one category code for assets of that type. You then use the **Category** form for your new asset type to create additional categories if you want to use this feature.

New categories are written to the `Category` table, which serves as the lookup table for the **Category** field on the **New** and **Edit** asset forms for asset types that use the basic asset model.

The purpose of the **Category** field and column is for site design. You can use category, or not, in your queries and query assets for your online site. The CS-Direct application does not base any of its functions on category codes. (With the exception that you can Search for assets based on this field, if you are using it.)

### Source

`Source` is a column and field that you can use to identify where an asset originated. Although CS-Direct provides administrative support (through the **Source** form) for you to use this feature in the design of your online site, the `source` column does not exist by default in the primary storage tables for basic asset types other than Article. If you want to use source with your basic asset types, you must include a property statement in your asset descriptor file for it.

For example, the Burlington Financial sample site has sources named WireFeed, Asia Pulse, UPI, and so on. Certain online pages select stories to display based on the results of queries that search for articles based on the value in their source column.

After you create a new basic asset type, you add new sources in the **Source** form on the **Admin** tab, if necessary. New sources are written to the `Source` table, which serves as the lookup table for the **Source** field on the **New** and **Edit** asset forms for basic-style assets.

### Subtype

The **subtype** concept provides a way to further classify an asset type. In the flex asset data model, the definition asset types create subtypes of flex and flex parent assets. In the basic asset data model, the concept of subtype is implemented through the `subtype` column in the primary storage table for the asset type.

The CS-Direct application uses the value of an asset's **Subtype** in many ways:

- For template assets, subtype means the type of asset that the template formats. Templates that format articles are a different subtype of template than templates that

format images. When you create an article asset, only the templates that format articles appear as options in the **Template** field on that asset's **New** or **Edit** form.

In addition, you can use the CSEE user interface to specify a subtype that will be displayed using a given template. For example, if your web site uses two subtypes of article asset, Sports and News, you can create a template that only displays articles with the Sports subtype.

- For query assets, subtype means the type of asset that the query returns. Query assets that return articles are a different subtype of query asset than those that return imagefiles.
- For collection assets, subtype means the type of asset that the collection holds. Collections that hold articles are a different subtype of collection asset than those that hold imagefiles.
- For the basic asset types that you design, subtype is designed to classify an asset based on how it is rendered. You can define a default template for each subtype of an asset type for each of your publishing targets.

If you do not need to assign a different template to assets of a specific type based on the publishing target for the asset, you do not need to create new subtypes.

If you create any subtypes for an asset type, the **New** and **Edit** forms for assets of that type display a field named **Subtype**. The drop-down list in the field displays all the possible subtypes for that asset type.

#### Note

In the flex asset model, the definition asset types serve as subtypes. For example, in the GE Lighting sample site, there is one product definition: lighting. This means that there is one subtype for product assets: the lighting subtype.

For some asset types, the subtype is set implicitly and cannot be changed. Other asset types allow users to choose a subtype for the asset using the CSEE user interface. The following table lists the CSEE asset types according to whether they have configurable subtypes:

Implicit Subtypes	Configurable Subtypes
<ul style="list-style-type: none"> <li>• All flex assets</li> <li>• Query assets</li> <li>• Collection assets</li> <li>• Template assets</li> </ul>	<ul style="list-style-type: none"> <li>• All custom basic assets (made with AssetMaker)</li> <li>• Article assets</li> <li>• Image assets</li> <li>• Linkset assets</li> <li>• Recommendation assets</li> <li>• Link assets</li> <li>• Page assets</li> </ul>

For information about setting configurable subtypes, see Chapter 13, “Designing Basic Asset Types.”

## Basic Asset Types and the Database

Although there is one primary storage table for basic asset types, CS-Direct keeps other kinds of supporting information for basic assets in other tables. When you create a new asset of a basic type, CS-Direct writes to the following database tables:

- The primary database table that holds assets of its type. For example, each page asset has a row in the `Page` table and each article asset has a row in the `Article` table.

These tables store all of the asset's attribute or field values, such as the asset's name, its object ID, who created it, which template it uses, and so on. The name of this table always matches the name of the asset type.

When you create a new basic asset type, the AssetMaker utility creates the primary storage table (a Content Server object table) for the asset type as a part of that process.

- The `AssetRelationTree` table, if the asset has unnamed parent-child relationships or named associations with other assets. (The relationships that basic assets can have are described in "Relationships Between Basic Assets" on page 169.)
- The `AssetPublication` table, which specifies which CSEE sites (publications) give you access to the asset. If the asset is shared between more than one site (publications), there is a row entry for each pubid. A **pubid** is a unique value that identifies a site (publication).
- The `SitePlanTree` table, if the asset is a page asset. This table stores information about the page asset's hierarchical position in your site plan.

When you develop the templates that display the assets that represent your content, you code elements with CS-Direct XML or JSP tags that extract and display the information from the tables in the preceding list.

Be sure to examine the CS-Direct **New** and **Edit** forms for the various sample asset types and to use the Content Server Explorer tool to examine the tables in your Content Server database.

### Note

Do **not** use Content Server Explorer tool to modify the data in any of these tables. All editing of assets and their related tables should be done only through the Content Server interface.

## Template Asset Type and the Database

Although the template asset type is a core CS-Direct asset type, it does not use the basic asset model. It is a complex asset type with entries in the following database tables:

- The `Template` table, its primary storage table
- The `SiteCatalog` table
- The `ElementCatalog` tables

When you create a new template asset, CS-Direct automatically creates entries in both the `SiteCatalog` and `ElementCatalog` tables for it. For more information about template assets, see Chapter 20, "Creating Collection, Query, Stylesheet, and Page Assets."

## Default Columns in the Basic Asset Type Database Table

CS-Direct needs several default columns for its basic functionality and so AssetMaker creates each of the following columns (as shown in the following table) in the asset type's primary storage table in addition to the columns defined in the asset descriptor file for that asset type.

Note that you do not need to code your asset descriptor files to include property statements for the columns in this list:

Default Column (Field) Name	Description	Where It's Displayed in the Content Server Interface
id	A unique ID for each asset, automatically generated by Content Server when you create the asset.  You cannot change the value in this field.	Forms: <ul style="list-style-type: none"> <li>• Inspect</li> <li>• Edit</li> <li>• Status</li> <li>• search forms</li> </ul>
name	A unique name for the asset. Names are limited to 64 alphanumeric characters.	Forms: <ul style="list-style-type: none"> <li>• New</li> <li>• Edit</li> <li>• Inspect,</li> <li>• Status</li> </ul> Also in the search results lists.
description	A short description of the asset that offers more information than just the name.	Forms: <ul style="list-style-type: none"> <li>• New</li> <li>• Edit</li> <li>• Inspect</li> <li>• Status</li> </ul> Also in the search results lists.
status	The status of the asset, one of the following status codes obtained from the StatusCode table: PL - created ED - edited RF - received (from XMLPost, for example) UP - upgraded from Xcelerate 2.x VO - deleted (void)  CS-Direct controls the value in this field: it cannot be edited manually.	Forms: <b>Status</b> , if the status of an asset is either PL (created) or ED (edited)  Note that assets with a status of VO (deleted) are not displayed anywhere in the Content Server Windows interface.

Default Column (Field) Name	Description	Where It's Displayed in the Content Server Interface
createdby	<p>The identity of the user who originally created the asset. This user name is obtained from the SystemUsers table.</p> <p>CS-Direct controls the value in this field: it cannot be edited manually.</p>	<p>Forms: <b>Status</b></p> <p>Also, if revision tracking is enabled for assets of this type, the <b>Revision History</b> list.</p>
createddate	<p>The date and time that the asset was written to the database for the first time.</p> <p>CS-Direct controls the value in this field: it cannot be edited manually.</p>	<p>Forms: <b>Status</b></p> <p>Also, if revision tracking is enabled for assets of this type, the <b>Revision History</b> list.</p>
updatedby	<p>The identity of the user who most recently modified the asset in any way. This user name is obtained from the SystemUsers table.</p> <p>CS-Direct controls the value in this field: it cannot be edited manually.</p>	<p>Forms: <b>Status</b></p> <p>Also, if revision tracking is enabled for assets of this type, the <b>Revision History</b> list.</p>
updateddate	<p>The date on which the information in the status field was changed to its current state.</p> <p>CS-Direct controls the value in this field: it cannot be edited manually.</p>	<p>Forms: <b>Status</b></p> <p>Also, if revision tracking is enabled for assets of this type, the <b>Revision History</b> list.</p>
startdate	<p>Promotion assets (a CS-Engage asset) have durations during which they can be displayed on the visitor pages on your live system. This column stores the start time of the promotion's duration.</p> <p>The promotion asset type is the only default asset type that uses this column.</p> <p>If you want to use the startdate and enddate fields for your asset types, see "Example: Enabling path, filename, startdate, and enddate" on page 271.</p>	<p>Forms:</p> <ul style="list-style-type: none"> <li>• <b>Duration, Edit, and Inspect</b> for promotion assets.</li> <li>• <b>New, Edit, Inspect, and Status</b> if you enable it for other asset types.</li> </ul>

Default Column (Field) Name	Description	Where It's Displayed in the Content Server Interface
enddate	<p>For promotion assets (a CS-Engage asset), this column stores the end time of the promotion's duration</p> <p>The promotion asset type is the only default asset type that uses this column.</p>	<p>Forms:</p> <ul style="list-style-type: none"> <li>• <b>Duration, Edit, and Inspect</b> for promotion assets</li> <li>• <b>New, Edit, Inspect, and Status</b> if you enable it for other asset types</li> </ul>
subtype	<p>The value of the asset's subtype. The subtype is set in different ways for different assets. For more information, see "Subtype" on page 170.</p>	<p>Forms:</p> <ul style="list-style-type: none"> <li>• <b>New, and Edit</b> for template assets (<b>Asset Type</b> field)</li> <li>• <b>New, and Edit</b> for query assets (<b>Result of Query</b> field)</li> <li>• <b>New, and Edit</b> for any asset type that has subtypes configured for it</li> <li>• <b>Set Default Templates</b></li> </ul>
filename	<p>The name to use for the file created for this asset during the Export to Disk publishing method.</p> <p>The page and article asset types are the only asset types that have this field enabled by default.</p> <p>If you want to use the filename field for your asset types, see "Example: Enabling path, filename, startdate, and enddate" on page 271</p>	<p>Forms:</p> <ul style="list-style-type: none"> <li>• <b>New and Edit</b> for page and article assets, by default</li> <li>• <b>New and Edit</b> for any other asset type that has the field enabled</li> </ul>

Default Column (Field) Name	Description	Where It's Displayed in the Content Server Interface
path	<p>The directory path to use for exported page files that are generated from child assets of this asset when the Export to Disk publishing method renders that asset into a file.</p> <p>The page and article asset types are the only asset types that have this field enabled by default.</p> <p>If you want to use the filename field for your asset types, see “Example: Enabling path, filename, startdate, and enddate” on page 271.</p>	<p>Forms:</p> <ul style="list-style-type: none"> <li>• <b>New</b> and <b>Edit</b> for page and article assets, by default</li> <li>• <b>New</b> and <b>Edit</b> for any other asset type that has the field enabled</li> </ul>
template	<p>The template for the asset.</p> <p>This is the template that is used to render the asset when it is either published with Export to Disk or rendered on a live dynamic delivery system.</p> <p>This template is also used to calculate the dependencies when the asset is approved for the Export to Disk publishing method, unless the asset type has subtypes and there is a default approval template assigned for the asset based on its subtype.</p>	<p>Forms:</p> <ul style="list-style-type: none"> <li>• <b>New</b></li> <li>• <b>Edit</b></li> <li>• <b>Inspect</b></li> <li>• <b>Status</b></li> </ul>
category	<p>The category code of the category assigned to the asset, if any.</p> <p>If you decide to use the category field to organize assets, you add category codes in the <b>Asset Types</b> forms on the <b>Admin</b> tab.</p>	<p>Forms:</p> <ul style="list-style-type: none"> <li>• <b>New</b></li> <li>• <b>Edit</b></li> <li>• <b>Inspect</b></li> <li>• <b>Status</b></li> </ul>
urlexternaldoc	<p>If the asset was entered with the CS-Desktop interface rather than the Content Server interface, stores the external document that is the source for the asset.</p> <p>For the 4.0 release, Microsoft Word is the only application that is integrated with the CS-Desktop feature.</p> <p>CS-Direct controls the value in this field: it cannot be edited manually.</p>	not applicable



Default Column (Field) Name	Description	Where It's Displayed in the Content Server Interface
externaldoctype	The mimetype of the file held in the <code>urlexternaldoc</code> field. CS-Direct controls the value in this field: it cannot be edited manually.	not applicable
urlexternaldocxml	Reserved for future use.	not applicable

## The Flex Asset Model

CS-Direct Advantage delivers the flex asset model. This asset model has the following main characteristics:

- Flex assets are defined by flex definitions—an asset type that determines which flex attributes make up an individual flex asset. Flex definitions create subtypes of the flex asset type.
- The definition asset types create subtypes of flex and flex parent assets, which allows individual instances of a flex asset or flex parent asset type to vary widely.
- Flex attributes are assets. The flex data model allows you to add flex attributes to (or remove them from) existing flex asset types at any time.
- Flex filters can take the data from one flex attribute, transform or assess it in some way, and then store the results in another flex attribute when you save the flex asset. The resulting value from a flex filter action is called a “derived” attribute value.
- Flex assets can inherit attribute values—even derived values—from their flex parents, which means that you can represent your data in hierarchies.

You do not create individual flex asset types as you do basic asset types; instead, you create a flex family of asset types.

## The Flex Family

The flex asset data model can be thought of in terms of a family of asset types. There are six flex asset types in a flex family:

Asset Type	Number Per Family
flex attribute type	one
flex asset type	one or more
flex parent type	one or more
flex asset definition	one or more
flex parent definition	one or more
flex filter type	one

To create a flex family, you use the **Flex Family Maker** forms on the **Admin** tab in the Content Server interface. You name each of the asset types in the family. For example, one of the flex families in the GE Lighting sample site is the product family. The flex asset is called the product asset, the flex attribute is called the product attribute, and so on.

The key member of a flex family is the **flex asset**. The flex asset is the unit of data that you extract from the database and display to the visitors of your online site (delivery system). All of the other members in the family contribute to the flex asset member in some way.

While the flex asset is the key, the **attributes** are the foundation of the flex asset model. An attribute is an individual component of information. For example, color, height, author, headline. You use attributes to define the flex assets and the **flex parents**. Flex assets inherit attribute values from their parents who inherit attribute values from their parents and so on.

You decide which attributes describe which flex assets and which flex parents by creating “templates” with the **flex asset definition** and **flex parent definition** asset types. Flex parents and their definitions implement the inheritance of attribute values.

Note that a flex parent or a flex asset cannot be defined by attributes of two types. The GE sample site has two kinds of attributes: product attributes and content attributes. A product asset (the flex asset member in the product flex family) can be defined by product attributes only—its definition cannot include content attributes.

A **flex filter** enables you to configure some kind of action to take place on the value of an attribute and then save the results of the action when the flex asset is saved. For example, you can configure a filter that converts the text in a Word file into HTML code.

In summary, the flex asset member of a flex family is the reason for the family, the unit of content that you want to display. The other members of a flex family provide data structure for the flex asset. However, because all of the members in the family are assets, you can take advantage of the standard CS-Direct features like revision tracking, workflow, search, and so on.

## Parent, Child, and Flex Assets

When you are using the flex asset data model, the phrase “parent-child” relationship refers to the relationship between a flex asset and its flex parent asset(s). This is a different parent-child relationship than the ones that basic assets have through named associations and unnamed relationships.

Although it is possible for flex assets to have the kinds of parent-child relationships that basic assets do, it is unlikely for the following reasons:

- CS-Direct Advantage provides the **ASSETSET** and **SEARCHSTATE** tag families, which you use instead of the collection and query asset types to select the flex assets that you want to display. For more information about this tag family, see “Assetsets and Searchstates” on page 189.
- Flex assets have no need for named associations. For example, if you want to assign an image file to a flex asset like a product, you can create an attribute that identifies the image file and assign it to the definition for the flex asset.
- While assets that are selected from the **Candidates** list box on a page asset have an unnamed parent-child relationship with that page asset, when you are using the flex asset model, it is unlikely that you would place a flex asset directly onto a page asset.

## Sample Site Flex Families

If the GE sample site is installed on your development system, there are two flex asset families that you can examine: the product family and the content family.

To better understand the following descriptions of the sample flex asset types, examine some of the product, article, and image assets in the Content Server interface as you read this section.

### The Product Family

The product family provides the data structure for the lighting products that are sold from the GE Lighting sample site. It creates an online catalog of lighting products.

These are the asset types in the product family:

- **Product attribute** is the flex attribute type used to define the products and product parents in the GE Lighting sample catalog. For example, there are product attributes named wattage, voltage, bulb size, ballast type, and so on.
- **Product** is the flex asset member of the product family. Product assets represent the lighting products that are sold from the GE Lighting sample site. In this online catalog, product names are numbers similar to a SKU number.
- **Product definition** is the flex definition asset type in the product family. It is used to create one subtype of products: lighting. The lighting definition formats (defines) all of the light bulbs in this online catalog.
- **Product parent** is the flex parent asset type in the product family. Product parents represent categories of products such as Compact Fluorescent, Fluorescent, Halogen, and so on.
- **Product parent definition** is the flex parent definition asset type in the product family. It is used to create subtypes of product parents. There are two: Category and Subcategory.

The product attribute, product definition, and product parent definition assets are listed on the **Design** tab because you use them for data design. The product and product parent assets are located on the sample site's **Product** tab.

The product asset is the reason for the product family: the GE Lighting sample site sells products.

### The Content Family

The content family provides the data structure for the articles that describe and images that illustrate the products that are sold from the GE Lighting sample site.

This is the content family:

- **Content attribute** is the flex attribute type used to define the articles (flex) and images (flex) that illustrate the products sold from the GE Lighting sample site.
- **Article (flex)** is a flex asset type that stores the text of an article and information about it. It has attributes such as byline, headline, subheadline, body, and so on.
- **Image (flex)** is a flex asset type that stores the URL of an image file. Although the GE Lighting sample site makes this asset type available, it does not use it.
- **Content definition** is the flex definition asset type in the content family. It is used to create one subtype of the article (flex) asset type called "story."

- **Content parent** is the flex parent asset type in the content family. Although the GE Lighting sample site makes this asset type available, it does not use it.
- **Content parent definition** is the flex parent definition asset type in the content family. Although the GE Lighting sample site makes this asset type available, it does not use it.

Notice that there are two flex asset types in the GE sample site's content family. They share attributes, parents, definitions, and parent definitions.

The content attribute, content definition, and content parent definition assets are listed on the **Design** tab because you use them for data design. The image (flex), article (flex), and content parent assets are located on the sample site's **Content** tab.

## Flex Attributes

**Flex attributes** are the foundation of the flex asset model. An attribute represents one unit of information. You use attribute assets to define flex assets and flex parents. They are then displayed as fields in the **New** and **Edit** forms for your flex assets and their parents.

An attribute is similar to a property for a basic asset. As does a property, an attribute defines the kind of data that can be stored in a column in a Content Server database table and describes a field in the CS-Direct Advantage forms. However, while a property defines one column in an asset type's database table, an attribute is an asset with database tables of its own.

This data structure (attributes as assets rather than columns) is one of the main reasons why flex assets are so flexible.

Once again, a flex parent or a flex asset cannot be defined by attributes of two types. For example, the GE Lighting sample site product asset can be defined by product attributes only—its definition cannot include content attributes.

## Data Types for Attributes

The data types for your attributes are defined by the Content Server database properties located in the `futuretense.ini` file, with the exception of the money data type, which is defined by a property in the `gator.ini` file (which is the name of the `.ini` file for CS-Direct Advantage).

The following table lists the data types for flex attributes and the properties that define them:

Type	Property	.ini file
date	cc.datetime	futuretense.ini
float	cc.double	futuretense.ini
integer	cc.integer	futuretense.ini
money	cc.money	gator.ini
string	cc.varchar	futuretense.ini
text	cc.bigtext	futuretense.ini
asset	cc.bigint	futuretense.ini
blob	cc.bigint	futuretense.ini

Type	Property	.ini file
url (deprecated in version 4.0)	cc.varchar	futuretense.ini

## Default Input Styles for Attributes

When a flex attribute is displayed as a field on a **New** or **Edit** form, it has default input styles based on its data types. The following list presents the default input styles for flex attributes:

- Date: input boxes that look like this:

yyyy-mm-dd hour:min:sec (Format)  
 -  -   :  :

- Float: text field with decimal position enforced.
- Integer: text field.
- Money: text field with currency format enforced.
- String: text field that accepts up to 255 characters.
- Text: text box. The number of characters that it accepts depends on the database and database driver you are using.
- Asset: drop-down list of all the assets of the type that was specified.
- Blob: a text field with a **Browse** button.
- URL: deprecated in version 4.0 but present for backward compatibility. You should use blob rather than URL.

If you do not want to use the default input style for a flex attribute, you can create an **attribute editor** and assign it to the attribute. Attribute editors are assets but they are also similar to the `INPUTFORM` statement in an asset descriptor file for a basic asset: they specify how data is entered into the attribute field. For more information about attribute editors, see Chapter 15, “Designing Attribute Editors.”

## Foreign Attributes

You can have flex attributes that are stored in foreign tables, that is, foreign attributes. They are subject to the following constraints:

- The foreign table must be registered with Content Server. That is, the foreign table must be identified to Content Server in the `SystemInfo` table. For information, see “Registering a Foreign Table” on page 215.
- The foreign table must have a column that holds an identifier that uniquely identifies each row. The identifier must have fewer than 20 characters.
- The foreign table must have a column that is reserved for the attribute data value, which can be of any appropriate data type. For example, if the attribute is of type string, the data type must be appropriate for a string.

## Flex Parents and Flex Parent Definitions

**Flex parents** and their **flex definitions** are organizational constructs that do two things:

- Implement the inheritance of attribute values. The parent definitions set up (describe) the rules of inheritance and the parents pass on attribute values to the flex assets according to those rules of inheritance.
- Determine the position of a flex asset on the tabs that display your assets in the Content Server interface. The hierarchy of the parents and the flex assets on the tabs in that tree are based on the hierarchy set up with the parent definitions.

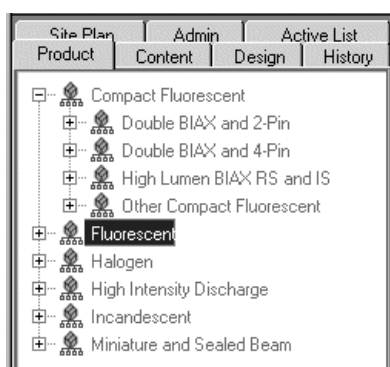
Each parent asset type has its own set of attributes, as specified in its parent definition. The parent definition creates a form that you see in the Content Server interface.

You use parents to organize or manage the flex assets by passing on attribute values that are standard and do not need to vary for each individual child asset of that parent.

Parent asset types affect how you and the content providers see and interact with the data within the Content Server interface.

For example, in the GE Lighting sample site there are two parent definitions: Category and SubCategory. Their sole purpose is to create structure on the sample site's **Product** tab in the tree (in the Content Server interface).

In the GE Lighting site, when the product parent's definition is Category, the product parent is displayed at the top level on the **Product** tab. When the product parent's definition is SubCategory, the product parent is displayed at the second level and it has a parent of its own:



For example, in the GE Sample site, there are several top-level product parents: Compact Fluorescent, Halogen, and so on. They were created with the Category definition. The next-level product parents, such as Double BIAX and 2-Pin, Double BIAX and 4-pin, and so on were created with the Subcategory definition.

## Business Rules and Taxonomy

The purpose of parent definitions and parent assets is not only to express the taxonomy of your data; they also allow you to apply business rules (logic) without risk of input error from end users. If, by creating a flex asset of a specific definition, there are dependencies that it should inherit, that flex asset should have a parent.

For example, here is a simple product, a toaster with five attributes:

- SKU = 1234
- Description = toaster
- Price = 20
- CAT1 = Kitchen
- CAT2 = Appliances

When the value of CAT2 is “Appliances,” the value of CAT1 can only be “Kitchen.” In other words, there is a business rule dependency between the value of CAT1 and the value of CAT2.

In this kind of case, there is no reason to require the content providers to fill in both fields. Because every field whose data has to be entered manually is a field that might hold bad data through input error, you would use inheritance to impose the business rule:

- Make CAT1 and CAT2 parent definitions.
- Make Kitchen a parent created with the CAT1 definition and Appliances a parent created with the CAT2 definition.
- Make Kitchen the flex parent of Appliances.

Now, when content providers create products, if they select Appliances for CAT2, the value for CAT1 is determined automatically through inheritance.

## Flex Assets and Flex Definitions

A **flex asset** is the reason for the flex family. It is the asset type that represents the end goal — a product, a piece of content that is displayed, and so on. For example, in the GE sample site there are three flex asset types:

- Product, which represents an individual saleable unit
- Article (flex), an asset that holds text
- Image (flex), an asset that holds the URL of a picture file

All of the other members in the family contribute to the flex asset member in some way.

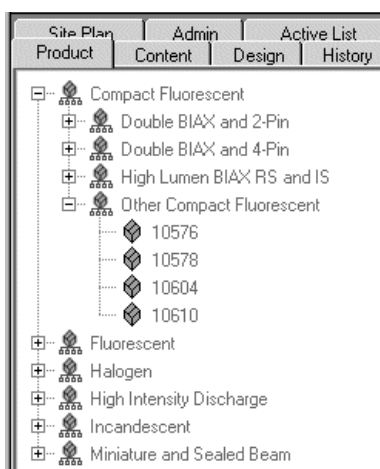
A **flex definition** describes one kind of the flex asset in a flex family; for example, a shoe, a toaster, a bowling ball, a brochure, a newsletter, an article, and so on. A flex definition is a template in that it directly affects a form that you see in the Content Server interface.

Although the GE sample site has only one flex definition for products (lighting) and one flex definition for articles and images, you can create as many flex definitions as you need.

For example, if you were designing a product catalog that offered both toasters and linens, you would certainly create a flex definition for toasters and a different flex definition for linens.

Individual flex assets can be created according to only one flex definition. You could not create a product that used both the toaster definition and the linens definition.

A flex asset has not only the attributes assigned directly to it when it was created, it also has the attributes that it inherits from a parent. It can have more than one flex parent and whether the parents have parents depends on the hierarchical structure that you design. The products in the GE sample site, for example, have three levels of hierarchy:



The Other Compact Fluorescent product parent has a parent of its own (Compact Fluorescent) and several children (10576, 10578, and so on).

## Flex Filters

Flex filters can transform, categorize, or perform other kinds of automated actions on the data in a flex attribute when a content asset is saved.

For example, imagine that your content providers use Microsoft Word to author their content and then use the CS-DocLink interface to save their Word documents as assets. Because you want to display their content in HTML format, you decide to configure a flex filter that converts the data in the .doc file to HTML and then saves and stores that data as an .htm file when they save the asset. You then design a template that extracts and displays the value of the attribute that holds the .htm file rather than the attribute that holds the .doc file.

There are several parts to the flex filter framework:

- Flex filter classes
- Registered transformation engines
- Flex filter assets

## Flex Filter Classes

**Flex filter classes** implement the transformation, classification, or other action. These classes are listed in the `Filters` table in the Content Server database. When you create a filter asset, you select a flex filter class for it.

CS-Direct version 5.5.1 delivers one flex filter class: Document Transformation. This filter converts a document from one file type into another by invoking a registered transformation engine.



## Registered Transformation Engines

**Registered transformation engines** are document conversion engines that are specified in the `SystemTransforms` table. If you create a filter asset that uses the Document Transformation class, you must also specify which transformation engine to use.

CS-Direct version 5.5.1 delivers one transformation engine, the Verity Keyview engine. This engine can convert up to 200 kinds of binary document files (.doc, .pdf, .txt, and so on) to either HTML or XML files. By default, it is configured to convert files to HTML.

Note that other packages that you purchase from divine to work with your CSEE system might register a transformation engine.

## Flex Filter Assets

**Flex filter assets** do the following two things:

- Specify which registered flex filter class to use.
- Specify which information is passed to the filter class (through arguments). For example, information about the data so the filter class knows which data to convert and where to store it when the asset is saved.

You assign flex filter assets to flex definition and flex parent definition assets.

When you create a flex filter asset, you specify the flex filter class to be used and then provide values for the arguments that the filter class needs in order to perform its action. The Documentation Transformation filter class (the default class) expects values for the following arguments:

- **Document Transformer Name** – the name of a registered transformation engine exactly as it is listed in the `SystemTransforms` table. The name of the Verity Keyview engine configured to convert binary files to HTML is listed as `Verity: Convert to HTML` in the `SystemTransforms` table.
- **Input Attribute Name** – the name of the flex attribute whose contents are to be converted by the flex filter. For the Document Transformation filter, the input attribute must be of type `blob` because it expects to find a binary file in that attribute.
- **Output Attribute Name** – the name of the flex attribute that stores the results of the document transformation. For the Document Transformation filter, the output attribute must be of type `blob` because it stores the results of the transformation as a binary file.

The data stored in the output attribute (field) is read-only because it has been derived from the data in the input attribute. This data is regenerated from the source data in the input attribute each time the asset is saved.

- **Output Document Extension** – the file extension to be assigned to the resulting file. When you specify that the document transformation engine is `Verity: Convert to HTML`, the document extension must be either `.htm` or `.html`.

After you create a flex filter asset, you assign it to the appropriate flex definition or flex parent definition assets. Then, when content providers create a flex asset of that definition, the filter performs its transformation or assessment when they save their assets.

## Flex Families and the Database

Each asset type in a flex family has several database tables. For example, the flex asset member has six tables and a flex parent type has five. This data model enables the flex member in a flex family to support more fields than an asset type that uses the basic data model can.

The four most important types of tables in the flex model are as follows:

- The primary table for the asset type
- The `_Mungo` table, which holds attribute values for flex assets and flex parent assets only
- The `MungoBlobs` table, which holds the values of all the flex attributes of type blob.
- The `_AMap` table, which holds information about the inheritance of attribute values for flex asset and flex parents only

There are several other tables that store supporting data about the relationships between the flex assets as well as additional configuration information (details about search engines, the location of foreign attributes, publishing information, and, if revision tracking is enabled, version information).

Additionally, certain kinds of site information are held in the same tables that basic assets use. For example, the `AssetPublication` table specifies which CSEE sites the asset type is enabled for.

When you develop the templates that display the flex assets that represent your content, you code elements that extract and display information from the `_Mungo` tables and the `MungoBlobs` table.

## Default Columns in the Flex Asset Type Database Table

As do basic asset types, each of the flex asset types has a primary storage table that takes its name from the asset type. For example, the primary table for the GE sample site asset type named `product` is called `Products`. The primary table for the product attribute asset type is called `PAttributes`.

Unlike the primary table for a basic asset type, the primary table for a flex asset type has only the default columns. This is because flex asset types that have attribute values do not store those values in the primary table—attribute values are stored in the `_Mungo` table for the asset type.

In general, the **default column types** in the primary table for a **flex asset type** are the **same** as the default columns in the primary storage table for a **basic asset type**. For the general list of default column types, see “Default Columns in the Basic Asset Type Database Table” on page 173.

However, there are, of course, exceptions and additions, as described in the following table:

Column	Description
category	Category is <b>not</b> used in the flex asset model so there is no category column in any of the primary tables for flex asset types.  Flex assets have no need for the category feature because queries for flex assets are based on the values of their flex attributes.
template	Only the table for the flex asset member in a flex family—product, article (flex), and image (flex), for example—holds values in this column. This is because only the flex asset member in the family can have a template asset assigned to it and be displayed on your online site.
renderid	Holds the object ID of the template asset assigned to a flex asset.
attributetype	An additional column in the primary table for flex attribute types. It holds the name of the attribute editor that formats the input style of the attribute when it is displayed in the <b>New</b> and <b>Edit</b> forms (if there is one).
flextemplateid	An additional column in the primary table for a flex asset type (the flex asset member of a flex family.) It holds the ID of the flex definition that the flex asset was created with.
flexgrouptemplateid	An additional column in the primary table for flex parent asset types. It holds the object ID of the parent definition that the flex parent asset was created with.

## The \_Mungo Tables

The flex asset and flex parent asset types have an *AssetType\_Mungo* table, where *AssetType* is the name of the flex asset type (and matches the name of the main storage table). Its purpose is to store the attribute values assigned to an asset when an asset of this type is created. For example the GE sample site table *Products\_Mungo* holds the attribute values for product assets.

Each attribute value has a separate row.

Each row in *\_Mungo* table has a value in each of the following columns:

Column	Description
id	A unique ID for each attribute value, automatically generated by Content Server when the flex asset is saved and the row is created. This is the table's primary key.
ownerid	The ID of the flex asset that the attribute value belongs to. (From the flex asset table: <i>Product</i> , for example.)
attrid	The ID of the attribute. (From the attribute table: <i>PAttributes</i> , for example.)
assetgroupid	If the attribute value is inherited, the ID of the parent who passed on the value. (From the parent table: <i>ProductGroups</i> , for example.)

Each row in a *\_Mungo* table also has all of the following columns but it will have a value (data) in only one of them, depending on the data type of the attribute:

Column	Description
floatvalue	If the attribute's data type is <i>float</i> , the value of the attribute.
moneyvalue	If the attribute's data type is <i>money</i> , the value of the attribute.
textvalue	If the attribute's data type is <i>textvalue</i> , the value of the attribute.
datevalue	If the attribute's data type is <i>date</i> , the value of the attribute.
intvalue	If the attribute's data type is <i>int</i> , the value of the attribute.
blobvalue	If the attribute's data type is <i>blob</i> , the ID of the row in the <i>MungoBlobs</i> table that holds the value of the attribute.
urlvalue	If the attribute's data type is <i>url</i> , the path or url entered for the attribute.
assetvalue	If the attribute's data type is <i>asset</i> , the ID of the asset.
stringvalue	If the attribute's data type is <i>float</i> , the value of the attribute.

Because the `_Mungo` tables have URL columns (see “Indirect Data Storage with the Content Server URL Field” on page 209), a default storage directory (`defdir`) must be set for it. You use the `cc.urlattrpath` property in the `gator.ini` file to set the `defdir` for your `_Mungo` tables.

## The MungoBlobs Table

There is one `MungoBlobs` table. It holds all the values for all flex attributes of type blob, for all the flex attribute types in your system. Each attribute value has a separate row in the table.

## The \_AMap Tables

Flex asset and flex parent asset types have an `AssetType_AMap` table. Its purpose is to map the asset to the attributes it inherits from its parents. Then when you create a template that displays the asset on a page in your online site, you can query for assets based on any of their attributes and display any of those attributes, whether they were inherited or were directly assigned.

The `_AMap` table has one row for each flex asset that has a value for the inherited attribute. (However, if an attribute has more than one value, the `_Mungo` table has a row for each value.)

An `_AMap` table has the following columns:

Column	Description
<code>id</code>	A unique ID for each row, automatically generated by Content Server when the flex asset is saved and the row is created. This is the table’s primary key.
<code>inherited</code>	The ID of the parent the attribute was inherited from, if it was inherited. (From the parent table: <code>ProductGroups</code> , for example.)
<code>attributeid</code>	The ID of the attribute. (From the attribute table: <code>PAttributes</code> , for example)
<code>ownerid</code>	The ID of the flex asset that the attribute value belongs to. (From the flex asset table: <code>Product</code> , for example.)

## Assetsets and Searchstates

CS-Direct Advantage provides the `ASSETSET` and `SEARCHSTATE` method families for identifying the individual flex assets that you want to display on your online pages.

### Assetset

An **assetset** is a group of flex assets or flex parent assets **only**— not flex attributes or flex definitions or flex parent definitions. For example, in the GE sample site, you can create assetsets that contain products, articles (advanced), or images (advanced). When you code your site pages, you code statements that create assetsets and then display the assets in them.

## Searchstate

You identify which flex assets should be in an assetset by using the `SEARCHSTATE` method family in the templates for your flex assets. A **searchstate** is a set of search constraints that are applied to a list or set of flex assets. A constraint can be either a filter (restriction) based on the value of an attribute or based on another searchstate (called a nested searchstate).

A searchstate can search either the `_Mungo` tables in the database or the attribute indexes created by a search engine. This means that you can mix database and rich-text (full-text through an index) searches in the same query.

Because these tags search only the `_Mungo` table or attribute indexes for that flex asset type, using them to extract your flex assets is much more efficient than using the `ASSET` tags or the query asset.

## Assetsets and Attribute Types

Because assetsets are created based on attribute values, only assets that share the same attribute type can be included in the same assetset. This is an important point to consider when you design your flex families: if you create flex asset types that do not share a common attribute type, you have separated your data and ensured that assets from different types cannot be included in a common assetset. And displaying assetsets is the mechanism for displaying flex assets on your delivery system.

For example, you can have two types of flex assets in the same flex family. As long as they use the same type of attributes, you can create assetsets that include assets of both types. Keep in mind, though, that a search across two types of flex assets creates a join between their `_Mungo` tables, which can deprecate performance.

In the GE sample site there are two flex asset types: article (advanced) and image (advanced). They share the same attribute type (content attributes) and the same definitions (content definition and content parent definition). However, it is the shared attribute type that enables them to be included in the same assetset— even though they are two different flex asset types.

However, because articles and images do not share an attribute type with the GE product asset type, you cannot create an assetset that includes products and articles.

## Search Engines and the Two Asset Models

Because the data structure of the two asset models is so different, there is a key difference in the way the asset models interact with a search engine:

- A basic asset type is defined by an asset descriptor file and its primary storage table includes all of its properties as columns. To specify which fields of a basic asset type should be indexed, you must customize certain elements for the asset type. (See Chapter 13, “Designing Basic Asset Types.”)
- Because “fields” for flex assets are flex attributes, which are assets, you decide which “fields” are indexed for rich-text search, attribute by attribute. Additionally, the CS-Direct Advantage application enables you to specify which attributes should be indexed with the **Search Engine** field on the attribute’s **New** and **Edit** forms. You do not need to customize any elements to enable this feature.

## Tags and the Two Asset Models

The ultimate goal of creating and managing assets is to move them to your delivery system, where the code in your elements can extract them from the database and display them to your site visitors. The CSEE applications offer various “toolsets,” custom tag sets, in both XML and JSP.

The toolset you use to extract assets from the database in your templates depends on the kind of asset that you are working with.

- For assets with the basic asset model, you use the `ASSET` method family.
- For the flex asset member in a flex family, you use the `ASSETSET` and `SEARCHSTATE` method families. Note that you **should not** use the `ASSET.LOAD` tag for the **flex asset member** in a flex family (product, article, and image, for example). Using `ASSET.LOAD` tag for flex assets is extremely inefficient because it retrieves all of the information for that asset from all of its tables. The `SEARCHSTATE` methods queries only the `_Mungo` table for the asset type of the flex asset and the `MungoBlobs` table.
- For recommendation assets, you use the `COMMERCECONTEXT` method family.

There are many more method families available with these products as well as an extensive set of custom tags from Content Server itself and several APIs.

For information about all the tags, see the *CSEE Developer's Tag Reference* and the *CSEE Java API Reference*.

See Section 4, “Site Development,” for information about coding elements and site pages.

## Summary: Basic and Flex Asset Models

This section summarizes the similarities and differences between the two asset models.

### Where the Asset Models Intersect

Even though there are many differences in the way that the basic and flex asset models function, there are several points of intersection.

- No matter which asset model you are using, basic (CS-Direct) or flex (CS-Direct Advantage), you use the template and page asset types that are delivered with the CS-Direct application.
- All asset types have a status code, which means that all assets—whether they are flex or basic—can be searched for with queries based on status.
- All asset types, whether they are flex or basic, have the following configuration or administrative traits in common:
  - They must be enabled by site.
  - They must have Start Menu items configured for them before anyone can create individual instances of those types.
  - Individual instances of them can be imported with the XMLPost utility.

### Where the Asset Models Differ

The following table summarizes the major differences between the asset models:

	Basic Asset Model	Flex Asset Model
<b>Number of database tables</b>	one	several
<b>Adding fields to an asset type</b>	Requires a schema change.	Does not require a schema change.
<b>Links to other assets</b>	Through named associations and unnamed relationships.	Through flex family relationships.
<b>Subtypes</b>	Usually available through the Subtype item on the Admin tab. For more information on how subtypes are set, see “Subtype” on page 170.	Through flex definitions and flex parent definitions.
<b>Search engine indexing</b>	Must customize certain elements for the asset type.	Use the <b>Search Engine</b> field in the flex attribute form.
<b>Main tag families</b>	ASSET, SITEPLAN, and RENDER	ASSETSET, SEARCHSTATE, and RENDER
<b>Publishing method</b>	Export to Disk and Mirror to Server	Mirror to Server Export to Server is possible, but is atypical for the flex model.



## Summary: Asset Types

The following table lists all the asset types delivered by the CSEE content applications and sample sites:

Name of asset type	Product or Sample Site
page	CS-Direct
template	CS-Direct
collection	CS-Direct
query	CS-Direct
CSElement	CS-Direct
SiteEntry	CS-Direct
link	CS-Direct
article	CS-Direct, Burlington Financial
imagefile	CS-Direct, Burlington Financial
stylesheet	CS-Direct, Burlington Financial
linkset	CS-Direct, Burlington Financial (for backward compatibility only)
image	CS-Direct, Burlington Financial (for backward compatibility only)
HelloArticle	CS-Direct, HelloAssetWorld
HelloImage	CS-Direct, HelloAssetWorld
attribute editor	CS-Direct Advantage
product	CS-Direct Advantage, GE Lighting
product attribute	CS-Direct Advantage, GE Lighting
product definition	CS-Direct Advantage, GE Lighting
product parent	CS-Direct Advantage, GE Lighting
product parent definition	CS-Direct Advantage, GE Lighting
article (flex)	CS-Direct Advantage, GE Lighting
image (flex)	CS-Direct Advantage, GE Lighting
content attribute	CS-Direct Advantage, GE Lighting
content definition	CS-Direct Advantage, GE Lighting
content parent	CS-Direct Advantage, GE Lighting
content parent definition	CS-Direct Advantage, GE Lighting

Name of asset type	Product or Sample Site
visitor attribute	CS-Engage
history attribute	CS-Engage
history definition	CS-Engage
segment	CS-Engage
recommendation	CS-Engage
promotion	CS-Engage
DrillHierarchy	CS-Engage, Burlington Financial Extension
PDF	CS-Engage, Burlington Financial Extension

## Chapter 9

# The CSEE Site

In the CS Content Applications (CS-Direct, CS-Direct Advantage, and CS-Engage), a “site” is an object that you use to manage or control access to assets as well as to use as a design aid in the Content Server interface. The Burlington Financial sample site is such a site. So is the GE Lighting sample site.

You create the same sites (with exactly the same names) on the development system, the management system, and the delivery name.

This chapter contains the following sections:

- Sites
- Sites and the Site Plan
- Sites and the Database

## Sites

A CSEE **site** is an object that you use as a design aid or organizational construct for the online site that you are delivering from your CSEE delivery system and as an access control tool on the management system. A CSEE site represents your online site.

When you log in to Content Server running any of the CSEE content applications, you are logging in to a CSEE site. If you have access to more than one site, the first decision that you make after logging in is which site you want to work on. From that point on, all of the tasks that you complete are completed in the context of that site (until you switch sites).

You use CSEE sites for two things.

- **Access** – to control or restrict the content providers who have access to your assets and asset types on the management system. Asset types are enabled by CSEE site. Therefore, if a CSEE site does not have a specific asset type enabled, the content providers who log in to that CSEE site do not have access to assets of that type.

Additionally, you can share individual assets between CSEE sites (providing that those sites have that asset type enabled and they have a common set of users that work in both sites). This means that you can also restrict access to specific assets. Even if the asset type is enabled, an asset created in one site is not available in another unless it has been shared to the other site.

- **Design** – to help design the layout of and arrange the content that is displayed on the online site represented by the CSEE site. You use the **Site Plan** tab to create a design framework for the online site. Each CSEE site has a separate site plan, which is stored in the `SitePlanTree` table.

CSEE sites represent real, online sites. However, they can represent those online sites in any number of ways, depending on what makes sense for your situation. For example:

- One CSEE site can represent one complete online (public) site.
- Several CSEE sites can represent separate sections of one large online site. For example, with a catalog, perhaps people who do the data entry for household goods never do data entry for yard goods so there are separate sites that represent those areas. And, in a publication example, perhaps sports writers have a separate site that represents the sports news section and the financial writers have a separate site that represents the financial news section.
- Several CSEE sites can represent the same online site but exist to restrict users' access to asset types, by role. For example, site one has the article and image asset types enabled and only content providers have access to this site and site two has all asset types including templates enabled and only a small group of developers have access to the site.

## Developers and the CSEE Site

Because you must log in to a CSEE site when you use your CSEE content applications, all asset development is done in the context of a CSEE site. As you develop asset types, design your online site pages, and code template assets, consider the following:

- When you create a template asset, CS-Direct creates entries for it in both the `SiteCatalog` table and the `ElementCatalog` table. The name that it assigns to the page entry in the `SiteCatalog` table includes the name of the site that you were logged in to when you created the template asset.

- If you share a template asset with more than one CSEE site, CS-Direct creates a page entry in the `SiteCatalog` for each site that it is shared with. The names of the additional page entries for a shared template include the name of the site that the template was shared with.

Therefore, you must use the same CSEE site names on your development system that you will use on the management and delivery systems for your online site to function properly.

Because CSEE sites cover both design issues and access issues, you must work with your system administrators when determining how to use CSEE sites and how many sites you need for your system.

After you determine how many CSEE sites you need for both design and access control reasons on your management system, you or your system administrators can create the appropriate CSEE sites and enable the appropriate asset types for those sites on all of your systems. Then, on your development and management systems, you or your system administrators configure which content providers and other users (such as you) have access to which sites.

To configure CSEE sites, you use the **Site** option on the **Admin** tab.

## Sites and the Site Plan

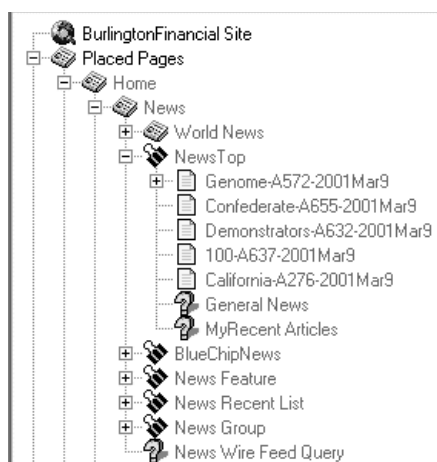
Page assets are site design assets that store references to other assets, organizing your assets according to the design that you and other developers are implementing. During the design phase of your online site, you create page assets, associate other assets with them, and then position the page assets in the tree on the **Site Plan** tab, located in the tree on the left side of the CS-Direct window.

When page assets are positioned in the tree on the **Site Plan** tab, information about its position in that tree is written to the `SitePlanTree` table. If the page assets that are positioned on this tab represent the same hierarchy that your templates and elements are coded to create on your published pages, you can use the CS-Direct `SITEPLAN` tag family to build navigational features. (See “Example 6: Displaying Site Plan Information” on page 526 for more information.)

The **Site Plan** tab displays a graphical representation of the layout of your online site, the CSEE site that you are currently logged in to, as a tree. It starts by querying the `SitePlanTree` table to determine which page assets have been placed. It then displays the page assets at the appropriate level on the tree, with the assets that have been associated with those page assets at subsequent hierarchical levels.

### Example: the Burlington Financial Sample Site

The tree on the **Site Plan** tab shows assets, not rendered site pages. In other words, it does not represent all the possible online pages that could be delivered by the actual online site. For example, this is the section of the **Site Plan** tree that shows the Home page asset of the Burlington Financial sample site:



To better understand the connection between your online site and the **Site Plan** tab, display the rendered Burlington Financial News page asset in your browser:

1. Log in to the Burlington Financial sample site.
2. Select the **Site Plan** tab.
3. Select the **News** page asset from the tree, click the right mouse button, and select **Preview**.

Compare the News web page that is rendered in your browser to this section of the **Site Plan** tab and note the following:

- The News page asset represents an actual page that would be rendered if a visitor selected the News link from the online Burlington Financial home page. This is because the template assigned to the News page is coded to display the page asset as a web page.
- The collection assets displayed in the tree under the News page asset do not represent actual rendered pages. The template for the News page is coded to display the headlines of the articles contained in the collections that are associated with the News page as links in the online News page.
- The article assets contained in the NewsTop collection represent actual online pages. This is because the template that displays the article when you click the link to them is coded to display the article in a separate web page.

Because it is the code in the template that determines how an asset is displayed in your online site, there can be many online pages that are not represented as page assets in the **Site Plan** tree.

In order to select the correct assets for your page assets, you must know what the template elements for your assets are coded to do. This is why creating and placing page assets is your responsibility and it is a task that you complete as you code your template elements.

Page assets serve as “gateway” or “index” pages that offer access to other assets that represent content in addition to representing actual online pages.

## Sites and the Database

When you create a site, CS-Direct writes information about it to the following database tables:

- The `Publication` table, which holds the names, descriptions, and pubids (IDs) of all the sites (publications) created for your system.
- The `PublicationTree` table, which stores information about which asset types have been enabled for which sites.
- The `SitePlanTree` table, which stores information about the hierarchical structure of a site and its page assets. There is a top-level node for each site created for your system. This table lists sites and page assets.

As a developer, you can code your elements to extract and display information from the `SitePlanTree` table (for example, to create links to the major sections of your online site).

### Note

Early versions of CS-Direct used the term “publication” rather than the term “site” and several of the database tables in the Content Server database still refer to sites as publications.





## Chapter 10

# The Content Server Database

Just about everything in Content Server and the CSEE content applications is represented as a row in a database table.

This chapter describes the various kinds of tables and columns in the Content Server database and presents procedures for creating tables. The CSEE content applications (CS-Direct, for example) deliver most of the tables that you need. However, if you are using Content Server to develop your own application or you need to use a table that does not hold assets—a lookup table, for example—you create that table using one of the methods described in this chapter.

This chapter contains the following sections:

- Types of Database Tables
- Types of Columns (Fields)
- Creating Database Tables
- How Information Is Added to the System Tables
- Property Files and Remote Databases

For information about managing the data in non-asset tables, see Chapter 11, “Managing Data in Non-Asset Tables.”

### Note

Content Server database tables used to be called “catalogs” and there are still remnants of that terminology throughout the application in table names, servlet names (CatalogManager), and the Java interfaces that you use to work with data in the database.

## Types of Database Tables

There are five types of tables in the Content Server database:

- Object tables, which hold data as objects and provides a unique identifier, automatically, for each row in the table
- Tree tables, which hold the hierarchical information about relationships between objects in object tables
- Content tables, which hold flat data and do not provide a unique identifier for each row
- System tables, which are core Content Server application tables that cannot be modified
- Foreign tables, which can be either of the following:
  - Tables that are outside of the Content Server database but that Content Server has access to.
  - Tables that are in the Content Server database but that Content Server did not create.

Content Server can cache the resultsets from queries against any table in the Content Server database, including foreign tables.

## Object Tables

Object tables store data as an object and can be represented in hierarchies. Those objects can be loaded, saved, and managed with the CatalogManager API. The asset type tables for CS-Direct and CS-Direct Advantage are object tables.

The primary key for object tables is always the ID (`id`) column and that cannot be changed. When you instruct Content Server to add an object table, it creates an ID column in that table. ID is a unique identifier that Content Server assigns by default to each row as it is added to the table. For example, when someone creates a new asset with CS Direct, Content Server determines the ID and assigns that value as the ID for that asset.

You cannot change the ID that Content Server assigns to objects (such as assets).

### Note

When AssetMaker or Flex Family maker creates an object table for a new asset type, they creates several additional columns by default. For information about the default columns in basic asset tables, see “Default Columns in the Basic Asset Type Database Table” on page 173.

Anytime you need to store data and you want to ensure that each row of that data is uniquely identified, use an object table because Content Server handles ID generation for you.

Examples of object tables (catalogs)

- All tables that hold assets
- Many of the CS-Direct publishing tables
- The CS-Engage tables that hold visitor data

## Tree Tables

Tree tables store information about the hierarchical relationships between object tables. In other words, object tables can be represented in hierarchies, but the hierarchy itself is stored in a tree table—the hierarchy **is** the tree.

For example, CS-Direct adds the following tree tables to the Content Server database:

- `AssetRelationTree`, which stores information about associations between assets. These associations create parent-child relationships. (For information about asset associations, see “The Flex Asset Model” on page 177.)
- `SitePlanTree`, which stores information about parent-child relationships between page assets and the assets that are referred to from those assets. This information is presented graphically on the **Site Plan** tab that is present in the Content Server interface when CS-Direct is installed.

Each row in a tree table is a node in that tree. Each node in a tree table points to two places:

- To an object in an object table, that is, to the object that it represents
- To its parent node in that tree table, unless it is a top-level node and has no parent

In other words, the object itself is stored in an object table. That object’s relationships to other objects in the database (as described by the tree) are stored in the tree table as a node on a tree.

Note that children nodes point to parent nodes but parents do not point to children.

When you create a tree table, it has the following columns by default. You cannot add to or modify these columns:

Column	Description
<code>nid</code>	The ID of the node. This is the primary key.
<code>nparentid</code>	The ID of the node’s parent node.
<code>nrank</code>	A number that ranks peer or sibling nodes. For example, the <code>AssetRelationTree</code> table uses this column to determine the order of the assets that are in collections.
<code>otype</code>	The object type of the node. For example, in the <code>SitePlanTree</code> table (a CS-Direct table), <code>otype</code> is either the asset type “page” or the name of a site (“publication”). In the <code>AssetRelationTree</code> table (another CS-Direct table), <code>otype</code> is an asset type and is the name of the object table for assets of that type.
<code>oid</code>	The ID of the object that the node refers to.
<code>oversion</code>	Reserved for future use by FatWire.
<code>ncode</code>	Holds a string that has meaning in the context of what the table is being used for. For example, in the <code>SitePlanTree</code> , <code>ncode</code> is set to “placed” or “unplaced” based on whether the page asset that the node refers to has been placed or not. In the <code>AssetRelationTree</code> , <code>ncode</code> holds the name of a named association.

## Content Tables

Content tables store data as flat data (rather than as objects) and that information cannot be organized in a hierarchy. You use content tables for simple lookup tables. For example, these are only a few of the content tables that CS-Direct adds to the Content Server database:

- **Source**, which holds strings that are used to identify the source of an article or image asset
- **Category**, which holds codes that are used to organize assets in several ways
- **StatusCode**, which holds the codes that represent the status of an asset

All three of these tables are lookup tables that the CS-Direct product uses to look up values for various columns in the asset type tables (object tables).

In another example, CS-Direct also adds a content table called `MimeType`. This table holds mimetype codes that are displayed in the **Mimetype** fields of the Burlington Financial sample site asset types named `stylesheet` and `imagefile`. The **Mimetype** fields for these asset types query the `MimeType` table for mimetype codes based on the `keyword` column in that table.

## Setting the Primary Key for a Content Table

When you create a content table, an ID column is not created for you and the primary key is not required to be ID. This is another major difference between content tables and object tables.

The `cc.contentkey` property in the `futuretense.ini` file specifies the name of the default primary key for all content tables. When you create a new content table, you are responsible for defining a column with the name specified by the `cc.contentkey` property.

However, you can override the identity of the primary key for a specific content table by adding and setting a custom property in the `futuretense.ini` file. This property must use the following format:

```
cc.tablenameKey
```

For example, if you create a content table named `Books` and you want to override the default primary key so that it uses the `ISBN` column instead, you would add a property named `cc.BooksKey` and set it to `ISBN`.

## Foreign Tables

A foreign table is one that Content Server does not completely manage. For example, perhaps your site pages perform queries against a table that is populated by an ERP system and Content Server displays that information to your site visitors.

Content Server can query foreign tables and cache the resultsets just as it does for its own object and content tables. However, you must first identify that foreign table to Content Server by adding a row for it in the `SystemInfo` table.

This is the **only** time you should ever modify information in the `SystemInfo` table.

Additionally, you must be sure to flush the Content Server resultset cache with a `CatalogManager flushcatalog` tag whenever the external system updates the tables that you query. Otherwise, the resultsets cached against those tables might not be up-to-date.

For information about resultset caching, see Chapter 12, “Resultset Caching and Queries.”

## System Tables

System tables are core, Content Server tables whose schema is fixed. They are implemented in Content Server by their own classes and they do not follow the rules (for caching and so on) that the other tables follow.

You can add rows to some of the system tables (either using the Content Server Management Tools forms, found on the Admin tab of the Content Server UI, or the Content Server Explorer tool), but you cannot add or modify the columns in these tables in any way. You also cannot add system tables to the database.

The following table lists and defines the Content Server system tables:

Table	Description
SiteCatalog	Lists a page reference for each page or pagelet served by Content Server.
ElementCatalog	Lists all the XML or JSP elements used in your system. An element is a named piece of code. For more information about the SiteCatalog and the ElementCatalog tables, see Chapter 19, “Creating Template, CSElement, and SiteEntry Assets.”
SystemACL	<p>Has a row for each of the access control lists (ACLs) that were created for your Content Server system. ACLs are named definitions of roles or users who have particular access permissions, called privileges.</p> <p>For information about creating ACLs, see the <i>CSEE Administrator's Guide</i>.</p> <p>For information about using ACLs to implement user management for your online site, Chapter 23, “User Management on the Delivery System.”</p>
SystemEvents	<p>Has a row for each event being managed by Content Server. An event represents an action that takes place on a certain schedule.</p> <p>Content Server inserts a row in this table when you set an event by using either the APPEVENT or EMAILEVENT tags.</p>
SystemInfo	Lists all the tables that are in the Content Server database and any foreign tables that Content Server needs to reference.
SystemSQL	Holds SQL queries that you can reuse in as many pages or pagelets as necessary. You can store SQL queries in this table and then use the <code>ics.CallSQL</code> method, CALLSQL XML tag, the <code>ics:callsql</code> JSP tag to invoke them. Then, if you need to modify the SQL statement, you only have to modify it once.
SystemSeedAccess	Registers Java classes that are external to Content Server but that Content Server has access to (includes access control).
SystemUsers	Lists all the users who are allowed access to pages, functions, and tables. Note that if you are using LDAP, this table is not used.

Table	Description
SystemUserAttr	Stores attribute information about the users such as their e-mail addresses. Note that if you are using LDAP, this table is not used.
SystemPageCache	Holds information about pages that are cached: the folder that it is cached to, the query used to generate the file name, the time it was cached, and the time that it should expire.
SystemItemCache	Holds information about specific items on pages that are cached (assets, for example): the identity of the item, the page it is associated with, and the time it was cached.

## Identifying a Table's Type

To determine the table type of any table in the Content Server database, examine the `SystemInfo` table, the system table that lists all the tables in the database:

1. Open the Content Server Explorer and log in to the Content Server database.
2. Double-click on the **SystemInfo** table.
3. In the list of tables, examine the **systable** column. The value in this column identifies the table type of the table represented by in the row:

Value in systable column	Definition
yes	system table
no	content table
obj	object table
tree	tree table
fgn	foreign table

### Note

If you do not have the appropriate ACLs assigned to your user name, you cannot open and examine the `SystemInfo` table.

## Types of Columns (Fields)

When you create new tables for the Content Server database, whether they hold assets or not, there are three general categories of field (column) types that you can specify for the columns in those tables:

- Generic field types
- Database-specific field types
- The Content Server URL field

### Generic Field Types

Generic field types refers to field types that work in any DBMS that CSEE supports. They are mapped to be compliant with JDBC standards. Therefore, if your Content Server system changes to a different DBMS, your database is still valid.

When you use generic, JDBC-compliant field types, you can use the CatalogManager API (CATALOGMANAGER XML or JSP tags, or the `ics.CatalogManager` Java method) to modify and maintain the data in your tables.

The following table contains a complete list of the Content Server generic field types and the database properties (from the `futuretense.ini` file) that define their data types. Refer to this list whenever you create a new table with the Content Server Management Tools forms, found on the `Admin` tree in the Content Server user interface, or the CatalogManager API:

Field Type	Description	Property
CHAR( <i>n</i> )	A short string of exactly <i>n</i> characters.	<code>cc.char</code>
VARCHAR( <i>n</i> )	A short string of up to <i>n</i> characters. For example, <code>VARCHAR(32)</code> means that this column can hold a string of up to 32 characters.	<code>cc.varchar</code> and <code>cc.maxvarcharsize</code> (The maximum value that you can set for <code>cc.varchar</code> depends on the value of the <code>cc.maxvarcharsize</code> property.)
DATETIME	A date/time combination.	<code>cc.datetime</code>
TEXT	A LONGVARCHAR, a variable-length string of up to 2,147,483,647	<code>cc.bigtext</code>
IMAGE	One binary large object (blob).	<code>cc.blob</code>
SMALLINT	A 16-bit integer, that is, an integer from -32,768 to +32,767.	<code>cc.smallint</code>
INTEGER	A 32-bit integer, that is, an integer from -2,147,483,648 to +2,147,483,647.	<code>cc.integer</code>

Field Type	Description	Property
BIGINT	A 64-bit integer, that is, integers having up to 19 digits.	cc.bigint
NUMERIC( <i>L</i> , <i>P</i> )	A floating-point (real) number, having a total number of <i>L</i> significant digits of which up to <i>P</i> significant digits are fractional. For example, NUMERIC(5, 2) could represent a number such as 806.35 but could not accurately represent a number such as 25693.2283	cc.numeric
DOUBLE	A double precision type.	cc.double

In addition to defining the column type, you must specify which of the following column constraints applies to the column:

Constraint	Description
NULL	It can hold a null value, that is, it can be left empty.
NOT NULL	It cannot hold a null value, that is, it cannot be left empty
UNIQUE NOT NULL	It must hold a value that is guaranteed to be unique in this table.
PRIMARY KEY NOT NULL	Marks the primary key column in a content table. You cannot set this column constraint for an object table.

When you use AssetMaker to create an object table for a new asset type (CS-Direct) or when you create new flex attributes (CS-Direct Advantage), the data types for those items are different than the ones listed here.

For more information about the data types for columns for basic asset types, see “Storage Types for the Columns” on page 257. For information about the data types for flex attributes, see “Data Types for Attributes” on page 180

## Database-Specific Field Types

You can use database-specific field (column) types in your tables. However, if you use field types that are specific to one kind of DBMS (that is, types that have not been mapped to a JDBC standard), note the following:

- You may not be able to use the CatalogManager API on those tables.
- If you ever change your DBMS you must also modify your tables.

For a complete list of field types specific to the DBMS that you are using, consult your DBMS documentation.



## Indirect Data Storage with the Content Server URL Field

Object and content tables in the Content Server database have a unique characteristic: columns can store their data indirectly, which means that you can store large bits of data externally to the DBMS but within the data repository.

To create such a column, you must use a column name that begins with the letters `url`. When you use the letters `url` as the first three letters of a column name, Content Server treats that column as an indirect data column.

Why use a URL field? For the following reasons:

- When the DBMS you are using does not support fields that are large enough to accommodate the size of the data that you want to store there
- If the DBMS you are using does not support enough fields in an individual table to contain the data that you want to store
- Because the performance of selecting data degrades with large field sizes

### The Default Storage Directory (`defdir`)

Any table with a URL column must have a default storage directory specified for it. This directory is where the values entered into the column are actually stored.

The phrase “default storage directory” is shortened to the word **defdir** in several places in the product. For example, the `defdir` column in the `SystemInfo` table holds the name of the default storage directory for tables with URL columns; one of the forms for the AssetMaker utility presents a **defdir** field; and so on.

The value entered into a URL field is actually a relative path to a file. Why a relative path? Because the value in a URL field is appended to the value of the table’s `defdir` setting.

The way that you set the `defdir` value for the tables that you create depends on the applications you have and what you are doing:

- If you create a new Content Server table with the **Content Server Management Tools** forms, found on the `Admin` tree in the Content Server user interface, and your table has a URL field, you enter the value for `defdir` in the **File Storage Directory** field in the **Add Catalog** (table) form.
- If you create a new Content Server table with the CatalogManager API, you use the `uploadDir` argument to set the value of `defdir`.
- If you create a new basic asset type, you specify the value of the `defdir` in the **defdir** field on the AssetMaker form. (Note that all tables that hold basic assets have a URL column and must have a `defdir` value set.)
- If you create a new flex asset type, you do **not** specify the value of the `defdir` for the URL column in the flex asset’s `_Mungo` table. This value is obtained from a property that was set when your CS-Direct Advantage application was installed. **Never** change the value of that property.

### Caution

After a table with a URL column is created, do not attempt to change or modify the `defdir` setting for the table in any way. If you do, you will break the link between the storage directory and the URL column, which means that your data can no longer be retrieved.

For information about creating URL fields, see the following procedures and examples:

- “Creating Database Tables” on page 210
- The upload field examples for basic asset types, starting with “Upload Example 1: A Standard Upload Field” on page 270
- The procedure for creating flex attributes of type blob in the section “Creating Flex Attributes of Type Blob (Upload Field)” on page 302.

## Creating Database Tables

This section describes how to create object, tree, and content tables and how to register foreign tables (that is, identify them to Content Server).

You cannot create or modify system tables.

### Creating Object Tables

There are three ways to create object tables:

- To create tables that hold basic asset types, you must use AssetMaker, a CS-Direct utility located on the **Admin** tab. AssetMaker creates the object table for the asset type as well as the CS-Direct forms that you use to create assets of that type. For more information, see Chapter 13, “Designing Basic Asset Types.”
- To create tables that hold flex asset types, you must use Flex Family Maker, a CS-Direct Advantage utility located on the **Admin** tab. For more information, see Chapter 14, “Designing Flex Asset Types.”
- To create an object table that does not hold assets, use the Content Server Management Tools, found on the Admin tree in the Content Server user interface,(or Content Server Explorer).

To create an object table that does **not** hold assets, complete the following steps:

1. Open your browser and enter this address:  
`http://your_server/Xcelerate/LoginPage.html`
2. Enter your login name and password and click **Login**.  
The Content Server interface appears.
3. Select the **Admin** tab and then select **Content Server Management Tools > Content Catalog** (table).

4. In the **ContentCatalogManagement** form, select **Add Catalog** (table) and click **OK**. The **Add Catalog** (table) form appears.

**Add Catalog**

**Catalog Information:**

Catalog Name  (required)

Catalog Type 

Content Catalog

 (required)

File Storage Directory  (required)

Access Privileges 

Browser

SiteGod

ContentEditor

ElementEditor

**Catalog Definition:**

Enter your fields in the form below, choosing a field name and field type (i.e. varchar(16)).

If you create a Content Catalog you must include a Field Name that corresponds to the name of the primary key specified in the Content Server property file (i.e. id). It's Field Type may be any legal database type.

If you create an Object Catalog, do not supply a primary key. It will be added automatically.

Field Name	Field Type
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

Add

5. Click in the **Catalog Name** (table name) field and enter a name. Do not use the name of a table that already exists. You can enter up to 64 alphanumeric characters, including the underscore (\_) character but not including spaces.
6. Click in the **Catalog Type** (table type) field and select **Object Catalog**.
7. If your table will have a URL column (an upload column), click in the **File Storage Directory** field (that is, the defdir) and enter the path to the file directory that will store the data from the URL column. If the directory does not exist yet, Content Server will create it for you.
8. Click in the **Access Privileges** field to select which ACLs (access control lists) a user must have in order to access this table. For information about ACLs, see the *CSEE Administrator's Guide*.
9. Click in the **Field Name** column and enter the name of the field. Remember that to create a URL column that stores data as a file located in an external directory, you must start the field name with the letters `url`. If you are creating a URL column, be sure that you have specified the file storage directory (defdir) for the data stored in this field (see step 7 of this procedure).

10. Click in the **Field Type** column and specify both the data type and column constraint for the column. Include a space between the data type and the column constraint.

For example: `VARCHAR( 32 ) NULL` or `INTEGER NOT NULL`.

For a list of the valid data types and the column constraints, see “Generic Field Types” on page 207.

11. Repeat steps 9 and 10 for each column in your new table.
12. Click the **Add** button.

Content Server adds the table to the database.

To verify that your table has been added, open Content Server Explorer and examine the `SystemInfo` table. Your new table should be included in the list with its `sysstable` column set to `obj`. If you specified a file storage directory, it is listed in the `defdir` column.

## Managing Data in Object Tables

There are several ways to modify and manage the data in object tables.

To create and modify **assets**, you use CS-Direct, CS-Direct Advantage, and CS-Engage applications. To extract assets from the database and then display them to the visitors of your delivery system, you use the CS-Direct, CS-Direct Advantage, and CS-Engage XML and JSP tags.

You can enter data into object tables that do not hold assets in one of the following ways:

- Programmatically, by coding forms with the `ics.CatalogManager` Java method or the `CATALOGMANAGER` XML and JSP tags, the `OBJECT` XML and JSP tags, and the Content Server SQL methods and tags, that prompt users for information and then to write that information to the database
- Manually by using either the Content Server Explorer tool or a form in the Content Server Management Tools forms to add rows to the table.

The following chapter, Chapter 11, “Managing Data in Non-Asset Tables,” presents information about the `CatalogManager` API and examples of adding rows to tables that do not hold assets.

## Creating Tree Tables

If you are using CS-Direct or any of the other Content Server content applications, it is unlikely that you would need to create a tree table.

Tree tables are managed by the `TreeManager` servlet. To create a tree table (catalog), you use the `ICS.TreeManager` Java method or the `TREEMANAGER` XML or JSP tags. You cannot create a tree table (catalog) with the Content Server Management Tools.

For example:

```
<TREEMANAGER>
  <ARGUMENT NAME="ftcmd" VALUE="createtree"/>
  <ARGUMENT NAME="treename" VALUE="ExampleTree"/>
</TREEMANAGER>
```

For a list of the columns that are created for tree tables, see “Tree Tables” on page 203. For information about the `TreeManager` methods and tags, see the *CSEE Java API Reference* and the *CSEE Developer's Tag Reference*.

## Managing Data in Tree Tables

The CS-Direct application and the other Content Server content applications manage all the data in their tree tables. You should never attempt to manually modify information in any of the CS-Direct tree tables.

If you have any tree tables that you created to manage relationships between your own object tables (that is, object tables that do not store assets), you use the `ICS.TreeManager` Java method or the `TREEMANAGER` XML or JSP tags. These tags and methods use an `FTValList` parameter, which describes the tree operation to be performed.

The following chapter, Chapter 11, “Managing Data in Non-Asset Tables,” presents information about the `CatalogManager` API and examples of adding rows to tables that do not hold assets.

## Creating Content Tables

To create a content table, use the Content Server Management Tools:

1. If you are using any of the CSEE applications, open your browser and enter this address:

`http://your_server/Xcelerate/LoginPage.html`

Note that *your\_server* is the name of the web server that you are using with CSEE.

2. Enter your login name and password and click **Login**.

The Content Server user interface appears.

3. Select the **Admin** tab and then select **Content Server Management Tools > Content Catalog (table)**.

The screenshot shows a web form titled "Enter Catalog Name:" with a subtext "(use '%' as a wild card)". To the right of the text is an empty text input field. Below this, the label "Select Operation:" is followed by four radio button options: "Modify Catalog" (which is selected), "Add Catalog", "Mirror Catalog", and "Delete Catalog". At the bottom left of the form is an "OK" button.

4. In the **ContentCatalogManagement** window, select **Add Catalog** (table) and click **OK**.

The **Add Catalog** (table) window appears.

**Add Catalog**

**Catalog Information:**

Catalog Name  (required)

Catalog Type  (required)

File Storage Directory  (required)

Access Privileges

---

**Catalog Definition:**  
 Enter your fields in the form below, choosing a field name and field type (i.e. varchar(16)).

If you create a Content Catalog you must include a Field Name that corresponds to the name of the primary key specified in the Content Server property file (i.e. id). It's Field Type may be any legal database type.

If you create an Object Catalog, do not supply a primary key. It will be added automatically.

Field Name	Field Type
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
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<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

5. Click in the **Catalog Name** (table name) field and enter a name. Do not use the name of a table that already exists. You can enter up to 64 alphanumeric characters, including the underscore (\_) character but not including spaces.
6. Click in the **Catalog Type** (table type) field and select **Content Catalog**.
7. If your table will have a URL column, click in the **File Storage Directory** field and enter the path to the file directory that will store the data from the URL column. If the directory does not exist yet, Content Server will create it for you.
8. Click in the **Access Privileges** field to select which ACLs (access control lists) a user must have in order to access this table. For information about ACLs, see the *CSEE Administrator's Guide*.
9. Click in the **Field Name** field and enter the name of the field. Remember that to create a URL column that stores data as a file located in an external directory, you must start the field name with the letters `url`. If you are creating a URL column, be sure that you have specified the file storage directory (defdir) for the data stored in this field (see step 7 of this procedure).

10. Click in the **Field Type** column and specify both the data type and column constraint for the column. Include a space between the data type and the column constraint.

For example: `VARCHAR(32) NULL` or `INTEGER NOT NULL`.

Remember that you must specify a primary key column and that it must exactly match either the setting for the `cc.contentkey` property or a custom property specified for this table in the `futuretense.ini` file.

For example: `INTEGER PRIMARY KEY NOT NULL`

11. Repeat steps 9 and 10 for each column in your new table.

12. Click the **Add** button.

Content Server adds the table to the database.

To verify that your table has been added, open the Content Server Explorer tool and examine the `SystemInfo` table. Your new table should be included in the list with the value in its `systable` column set to `no`. If you specified a file storage directory, it is listed in the `defdir` column.

When you add non-asset tables to facilitate some function of your site, you then need to either customize your asset forms in CS-Direct or create your own forms to enter and manipulate that data.

## Managing Data in Content Tables

There are several ways to modify and manage the data in content tables.

Most of the CS-Direct content tables have a CS-Direct form available from the Admin tab that you can use to edit or add data. For example, `Source` and `Category`. (`Mimetype`, however, does not.)

You can enter data into your custom content tables in one of the following ways:

- If the table was created such that users or visitors supply data that is written into the table, you code forms with the `ics.CatalogManager` Java method or the `CATALOGMANAGER` XML and JSP tags along with the Content Server SQL methods and tags—to prompt users for information and to then write it to the database programmatically.
- If the table is a simple lookup table that facilitates some function on your site, you enter data into it manually by using either the Content Server Explorer utility or the Content Server Management Tools window to add rows to the table.

Chapter 11, “Managing Data in Non-Asset Tables,” presents information about the `CatalogManager` API and examples of adding rows to tables that do not hold assets.

## Registering a Foreign Table

Registering a foreign table means identifying the table to Content Server by adding a row for the table to the `SystemInfo` table. Note that this is the only condition in which you should ever add a row to the `SystemInfo` table or change information held in the `SystemInfo` table in any way.

To register a foreign table, complete the following steps:

1. Open the Content Server Explorer and log in to the Content Server database.
2. Double-click on the **SystemInfo** table.

3. Right-click the mouse on the header for the **tblname** column and then select **New** from the pop-up menu.  
A new row appears.
4. In the new row, click in the **tblname** column and enter the name of the table.
5. Click in the **defdir** column and enter the path to the table.
6. Click in the **systable** column and enter `fgn`.
7. Click in the **acl** column and enter the names of the ACLs that have access to the table.
8. Select **File > Save All**.

## Managing Data in a Foreign Table

You can use the `ics.CatalogManager` Java method or the `CATALOGMANAGER` XML and JSP tags and the Content Server SQL methods and tags to interact with a foreign table. When you use these methods or tags to update data in the foreign table, Content Server can flush its resultset cache as needed.

If you use a method external to Content Server to update a foreign table, you must be sure to also use the `CATALOGMANGER` command `flushcatalog` to instruct Content Server to flush the resultset cache for that table.

## How Information Is Added to the System Tables

You cannot create system tables and with very few exceptions, you should always use the Content Server Management Tools to add rows to the system tables that you are allowed to add rows to. The way that information is added to each system table varies, as described in the following table:

Table	Method of Adding Information
SiteCatalog	<p>There are several ways that page entries are added to this table:</p> <ul style="list-style-type: none"> <li>• When you create a template asset, CS-Direct automatically creates a page entry for it in the <code>SiteCatalog</code> table.</li> <li>• When you create a <code>SiteEntry</code> asset, CS-Direct automatically creates a page entry for it in the <code>SiteCatalog</code> table.</li> <li>• You can use the Content Server Explorer tool or the <b>Site</b> form in the Content Server Management Tools interface.</li> </ul> <p>Note that if you want to set or modify page cache settings for page entries, it is easier to use forms in the Content Server interface than it is to use Content Server Explorer.</p> <p>See Section 4, “Site Development,” for information about designing pages.</p>



Table	Method of Adding Information
ElementCatalog	<p>There are several ways that elements are added to this table:</p> <ul style="list-style-type: none"> <li>• When you create a template asset, CS-Direct automatically creates an entry for it in the <code>ElementCatalog</code> table.</li> <li>• When you create a <code>CSElement</code> asset, CS-Direct automatically creates an entry for it in the <code>ElementCatalog</code> table.</li> <li>• You can use the Content Server Explorer tool to add non-asset elements.</li> </ul> <p>For information about coding elements and pages, see Chapter 21, “Coding Elements for Templates and <code>CSElements</code>.”</p>
SystemACL	<p>The <b>ACL</b> form in the Content Server Management Tools.</p> <p>For more information, see the <i>CSEE Administrator's Guide</i>.</p>
SystemEvents	<p>Content Server adds a row to this table for each event that is designated when an <code>APPEVENT</code> tag, <code>EMAILEVENT</code> tag, or Java API equivalent is invoked from an element.</p>
SystemInfo	<p>Do <b>not</b> add or modify information to this table.</p> <p>The <b>only exception</b> to this rule is if you need to identify a foreign table to Content Server.</p>
SystemSQL	<p>The Content Server Explorer tool</p> <p>For information about the various kinds of queries that are available, see Chapter 12, “Resultset Caching and Queries.”</p>
SystemUsers	<p>The <b>User</b> form in the Content Server Management Tools.</p>
SystemUserAttr	<p>The <b>User</b> form in the Content Server Management Tools.</p>

## Property Files and Remote Databases

There are several properties in the `futuretense.ini` file that control the connection to the Content Server database. These properties specify the configuration of the database and establish a privileged and non-privileged user connection between the database and the application server.

All of the database properties were configured for your system when your system was installed. By default, all commands operate on the Content Server database identified in the `futuretense.ini` file. The location of this file depends on which application server your system is using:

- With the Sun ONE Application Server, `futuretense.ini` is located in the `/ias/APPS` directory.
- With any other application server, `futuretense.ini` is located in the `FutureTense` directory.

## Property Files for Remote Databases

Content Server can also access remote databases. If you want to access and work with data that is kept in a remote database, you must create or identify a property file for that database.

Any property file for a remote database must be located in the same directory as the Content Server `futuretense.ini` file.

Additionally, it must include **all** of the **database properties** that are listed in the “Property Reference” chapter of the *CSEE Administrator's Guide*.

## Accessing the Property File for a Remote Database

To access a remote database from a Content Server page, use the `ics.LoadProperty` Java method or the `LOADPROPERTY` XML tag to specify the property file that identifies that database before the statement of the operation that you want to perform in that database.

For example:

```
<LOADPROPERTY FILE="example.ini"/>
```

After completing the operation on that remote database, be sure to re-establish the connection with the primary Content Server database by closing the connection to the remote database with the `ics.RestoreProperty` Java method or the `RESTOREPROPERTY` XML tag.

For example:

```
<RESTOREPROPERTY CLOSE="true"/>
```

## Chapter 11

# Managing Data in Non-Asset Tables

This chapter describes how to interact with Content Server database tables that do not hold assets.

There are two ways to work with the data in your custom, non-asset tables:

- Programmatically, using the tags and methods for the CatalogManager API to code forms for data entry and management
- Manually, by using the Content Server Explorer tool or the **Content** form in the Content Server Management Tools to manually add rows and data to those rows.

This chapter contains the following sections:

- Methods and Tags
- Coding Data Entry Forms
- Managing the Data Manually

To work with assets, you must log in to the Content Server interface and use the asset forms provided by the CS-Direct, CS-Direct Advantage, and CS-Engage applications.

To add large numbers of assets programmatically, use the XMLPost utility, as described in Chapter 16, “Importing Assets” and Chapter 17, “Importing Flex Assets.”

## Methods and Tags

This section provides an overview of the tags and methods that you use to program how you manage data in non-asset tables and how you interact with those tables in general.

### Writing and Retrieving Data

CatalogManager is the Content Server servlet that manages content and object tables in the database and the TreeManager servlet manages tree tables in the database.

- To access the CatalogManager servlet, you can use the `ics.CatalogManager` Java method, the `CATALOGMANAGER` XML tag, or the `ics:catalogmanager` JSP tag.
- To access the TreeManager servlet, you can use the `ics.TreeManager` Java method, the `TREEMANAGER` XML tag, or the `ics:treemanager` JSP tag.

These methods and tags take name/value pairs from arguments that specify the operation to perform and the table to perform that operation on.

### CatalogManager

The `ics.CatalogManager` java method, the `CATALOGMANAGER` XML tag, and the `ics:catalogmanager` JSP tag support a number of attributes that operate on object and content tables. The key attribute is `ftcmd`. By setting `ftcmd` to `addrow`, for example, you tell CatalogManager to add one row to the catalog.

CatalogManager security, when enabled, prevents users with the `DefaultReader` ACL from accessing CatalogManager. You enable CatalogManager security by setting the `secure.CatalogManager` property, found in the `futuretense.ini` file, to `true`. Note that your session will be dropped if you attempt to log out of CatalogManager when CatalogManager security is enabled.

These are the main `CATALOGMANAGER` XML tag's attributes, passed as argument name/value pairs, that modify the contents of a row or a particular field in a row:

argument name="ftcmd" value=	Description
<code>addrow</code>	Adds a single row to a table.
<code>addrows</code>	Adds more than one row to a table.
<code>deleterow</code>	Deletes a row from a table. You must specify the primary key column for the row.
<code>deleterows</code>	Deletes more than one row from a table. You must specify the primary key for the rows.
<code>replacerow</code>	Deletes the existing row in a table and replaces the row with the specified information.
<code>replaceroes</code>	Replaces multiple rows in a table. If a value is not specified for a column, the column value is cleared
<code>updaterow</code>	Performs a query against a given table and displays records from a table. The rows displayed match the criteria specified by the value of the parameters.

argument name="ftcmd" value=	Description
updaterow2	Like updaterow, updates values in columns for a row in a table; however, where you cannot clear columns with updaterow, updaterow2 allows you to clear columns if there is no value for the specified column (for example, if there is no related field in the form).
updaterows	Modifies field values for multiple rows in a table.
updaterows2	Like updaterows, modifies field values for multiple rows in a table; however, where you cannot clear columns with updaterows, updaterows2 allows you to clear columns if there is no value for the specified column (for example, if there is no related field in the form).

For more information and a complete list of the CatalogManager commands, see the *CSEE Developer's Tag Reference*. For information about the `ics.CatalogManager` Java method, see the *CSEE Java API Reference*.

## Tree Manager

Here are the main `ics.TreeManager` commands. Note that these operations manipulate data in the tree table only—but do not affect the objects that the tree table nodes refer to.

Name	Description
addchild	Given a parent node, add a child node.
addchildren	Add multiple child nodes.
copychild	Copy a node and its children to a different parent. All copied nodes point to the same objects.
createtree	Create a tree table.
delchild	Delete a node and its child nodes.
delchildren	Delete multiple nodes.
deletetree	Delete a tree table.
findnode	Find a node in a tree.
getchildren	Get all child nodes.
getnode	Get node and optionally object attributes.
getparent	Get the nodes parent.
listtrees	Get the list of all tree tables.
movechild	Move node and its child nodes to a different parent.
nodepath	Return parent; child path to a node.
setobject	Associate a different object with the node.

Name	Description
<code>validatenode</code>	Verify that a node is in a tree.
<code>verifypath</code>	Verify that a given path exists in a tree.

For information about the `ics.TreeManager` method, see the *CSEE Java API Reference*.

For information about the XML and JSP `TREEMANAGER` tags, see the *CSEE Developer's Tag Reference*.

## Querying for Data

There are three methods, with XML and JSP tag counterparts, to help your code query for and select content:

Method	XML tag	JSP tag	Description
<code>ics.SelectTo</code>	<code>SELECTTO</code>	<code>ics:selectto</code>	Performs a simple select against a single table.
<code>ics.SQL</code>	<code>EXECSQL</code>	<code>ics:sql</code>	Executes an inline SQL statement (embedded in the code).
<code>ics.CallSQL</code>	<code>CALLSQL</code>	<code>ics:callsql</code>	Executes a SQL statement that is stored as a row in the <code>SystemSQL</code> table.

To use `ics.CallSQL` (or the tags), you code SQL statements and then paste them into the `SystemSQL` table.

By storing the actual queries in the `SystemSQL` table and calling them from the individual pages (like you call a pagename or an element), you keep them out of your code, which makes it easier to maintain the SQL used by your site. If you want to change the SQL, you do not have to fix it in every place that you use it—you can just edit it in the `SystemSQL` table and every element that calls it now calls the edited version.

The `ics.CallSQL` and `ics.SQL` methods can execute any legal SQL commands. If a SQL statement does not return a usable list, Content Server will generate an error. If you choose to use SQL to update or insert data, you must include code that explicitly flushes the resultsets cached against the appropriate tables using the `ics.FlushCatalog` method.

## Lists and Listing Data

A number of ICS methods create lists. The `SelectTo` method, for example, returns the results of a simple SQL query in a list whose columns reflect the items in the `WHAT` clause and whose rows reflect matches against the table.

The `IList` interface can be used to access a list from Java. The lists are available by name using XML or JSP, and values can be iterated using the `LOOP` tag.

The lists created by Content Server point to underlying resultsets created from querying the database. Although the lists do not persist across requests, the resultsets do because if are cached.

### Note

Be sure to configure resultset caching appropriately. If the resultset of a query is cached, the list points to a copy of the resultset. If the resultset is not cached, the list points directly at the resultset which can cause database connection resource difficulties.

You can create your own list for use in XML or JSP by implementing a class based on the `IList` interface. (For information about `IList`, see the *CSEE Java API Reference*.) Then your application or page can transform data prior to returning an item in a list or to create a single list from many lists.

The following methods manage lists:

Method	Description
<code>ics.GetList</code>	Returns an <code>IList</code> , given the name of the list.
<code>ics.CopyList</code>	Copies a list.
<code>ics.RenameList</code>	Renames an existing list.
<code>ics.RegisterList</code>	Registers a list by name with Content Server so that you can reference the list from an XML or JSP element or by using the <code>GetList</code> method.

For an example implementation of an `IList`, see `SampleIList.java` in the `Samples` folder on your Content Server system.

## Coding Data Entry Forms

This section provides code samples that illustrate how to code forms that accept information entered by a user or visitor and to then write that information to the database using the Content Server methods and tags.

The examples in this section describe adding a new row, deleting a row, and querying for and then editing an existing row. Each example shows a version for XML, JSP, and Java.

### Adding a Row

A simple algorithm for adding a row is as follows:

1. Display a form requesting information for each of the fields in a row.
2. Write that form data to the table.

The following example adds a row to a fictitious table named `EmployeeInfo`. This table has the following columns:

Field	Data type
id	VARCHAR ( 6 )
phone	VARCHAR ( 16 )
name	VARCHAR ( 32 )

This example presents code from the following elements:

- `addrowFORM`, an XML element that displays a form that requests an employee ID number, phone number, and name.
- `addrowXML`, `addrowJSP`, and `addrowJAVA`, three versions of an element that writes the information entered by the employee to the `EmployeeInfo` table

### The addrowFORM Element

The `addrowFORM` element displays a form that asks the user to enter information. It looks like this:

Employee name:

Employee id number:

Phone number:

This is the code that creates the form:

```
<?xml version="1.0" ?>
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- Documentation/CatalogManager/addrowFORM
-->
```



```

<form ACTION="ContentServer" method="post "
  REPLACEALL="CS.Property.ft.cgipath">
  <input type="hidden" name="pagename" value="Documentation/
  CatalogManager/addrow"/>

<table>
<tr>
  <td>Employee name:</td>
    <td><input type="text" value="" name="EmployeeName"
      size="22" maxlength="32"/></td>
</tr>
<tr>
  <td>Employee id number:</td>
    <td><input type="text" value="" name="EmployeeID" size="6"
      maxlength="6"/></td>
</tr>
<tr>
  <td>Phone number:</td>
    <td><input type="text" value="" name="EmployeePhone" size="12"
      maxlength="16"/></td>
</tr>
<tr>
  <td colspan="2"><input type="submit" name="submit"
    value="Submit"/></td>
</tr>
</table>

</form>
</FTCS>

```

Notice that the maxlength modifiers in <INPUT> limit the length of each input to the maximum length that was defined in the schema.

The user fills in the form and clicks the **Submit** button. The information gathered in the form and the pagename of the addrow page (see the first input type statement in the preceding code sample) is sent to the browser. The browser sends the pagename to Content Server. Content Server looks it up in the SiteCatalog table and then invokes that page entry's root element.

## Root Element for the addrow Page

The root element of the addrow page is responsible for adding the information passed from the addrowFORM element to the database — that is, for adding a row to the EmployeeInfo table and populating that row with the information passed from the addrowFORM element.

There can only be one root element for a Content Server page (that is, an entry in the SiteCatalog table). This section shows three versions of the root element for the addrow page:

- addrowXML.xml
- addrowJSP.jsp
- addrowJAVA.jsp

**addrowXML**

This is the code in the XML version of the root element:

```
<?xml version="1.0" ?>
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- Documentation/CatalogManager/addrowXML
-->

<SETVAR NAME="errno" VALUE="0"/>
<CATALOGMANAGER>
  <ARGUMENT NAME="ftcmd" VALUE="addrow"/>
  <ARGUMENT NAME="tablename" VALUE="EmployeeInfo"/>
  <ARGUMENT NAME="id" VALUE="Variables.EmployeeID"/>
  <ARGUMENT NAME="phone" VALUE="Variables.EmployeePhone"/>
  <ARGUMENT NAME="name" VALUE="Variables.EmployeeName"/>
</CATALOGMANAGER>
errno=<CSVAR NAME="Variables.errno"/><br/>
</FTCS>
```

**Note**

The example code can use the CATALOGMANAGER tag because the fictitious table, EmployeeInfo, has Content Server generic field types. addrowXML might not work if EmployeeInfo has database-specific field types. For more information, see “Generic Field Types” on page 207

**addrowJSP**

This is the code in the JSP version of the root element:

```
<%@ taglib prefix="cs" uri="futuretense_cs/ftcs1_0.tld" %>
<%@ taglib prefix="ics" uri="futuretense_cs/ics.tld" %>
<%//
// Documentation/CatalogManager/addrowJSP
//%>
<%@ page import="COM.FutureTense.Interfaces.*" %>
<%@ page import="COM.FutureTense.Util.ftMessage"%>
<%@ page import="COM.FutureTense.Util.ftErrors" %>
<cs:ftcs>

<ics:setvar name="errno" value="0"/>
<ics:catalogmanager>
  <ics:argument name="ftcmd" value="addrow"/>
  <ics:argument name="tablename" value="EmployeeInfo"/>
  <ics:argument name="id"
    value='<%=ics.GetVar("EmployeeID")%>' />
  <ics:argument name="phone"
    value='<%=ics.GetVar("EmployeePhone")%>' />
  <ics:argument name="name"
    value='<%=ics.GetVar("EmployeeName")%>' />
</ics:catalogmanager>
```

```
errno=<ics:getvar name="errno"/><br/>
```

```
</cs:ftcs>
```

### addrowJAVA

This is the code in the Java version of the root element:

```
<%@ taglib prefix="cs" uri="futuretense_cs/ftcs1_0.tld" %>
<%//
// Documentation/CatalogManager/addrowJAVA
//%>
<%@ page import="COM.FutureTense.Interfaces.*" %>
<%@ page import="COM.FutureTense.Util.ftMessage"%>
<%@ page import="COM.FutureTense.Util.ftErrors" %>
<cs:ftcs>

<!-- user code here -->
<%
ics.SetVar("errno","0");
FTValList vl = new FTValList();
vl.put("ftcmd","addrow");
vl.put("tablename","EmployeeInfo");
vl.put("id",ics.GetVar("EmployeeID"));
vl.put("phone",ics.GetVar("EmployeePhone"));
vl.put("name",ics.GetVar("EmployeeName"));
ics.CatalogManager(vl);
%>
errno=<%=ics.GetVar("errno")%><br />

</cs:ftcs>
```

## Deleting a Row

The following example deletes a row from the fictitious `EmployeeInfo` table described in the “Adding a Row” on page 224 is section.

This section presents code from the following elements:

- `deleterowFORM`, an XML element that displays a form that requests an employee name to delete from the `EmployeeInfo` table
- `deleterowXML`, `deleterowJSP`, and `deleterowJAVA`, elements that delete a row from the `EmployeeInfo` table based on the information sent to it from the `deleterowFORM` element

### The deleterowFORM Element

The `deleterowFORM` element displays a form that asks the user to enter an employee name. This is the code that creates the form:

```
<?xml version="1.0" ?>
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- Documentation/CatalogManager/deleterowFORM
-->
```

```

<form ACTION="ContentServer" method="post "
REPLACEALL="CS.Property.ft.cgipath">
<input type="hidden" name="pagename" value="Documentation/
CatalogManager/deleterow"/>

<table>
<tr>
    <td>Employee name:</td>
    <td><input type="text" value="Barton Fooman"
name="EmployeeName" size="22" maxlength="32"/></td>
</tr>
<tr>
    <td colspan="2"><input type="submit" name="submit"
value="submit"/></td>
</tr>
</table>
</form>
</FTCS>

```

The user enters an employee name and clicks the **Submit** button. The employee name and the pagename for the deleterow page (see the first `input type` statement in the preceding code sample) are sent to the browser.

The browser sends the pagename to Content Server. Content Server looks it up in the SiteCatalog table and then invokes that page entry's root element.

## Root Element for the deleterow Page

The root element of the deleterow page is responsible for deleting a row from the EmployeeInfo table, based on the employee name that is sent to it from the deleterowFORM element.

There can only be one root element for a Content Server page (that is, an entry in the SiteCatalog table). This section shows three versions of the root element for the deleterow page:

- deleterowXML.xml
- deleterowJSP.jsp
- deleterowJAVA.jsp

### deleterowXML

This is the code in the XML version of the element:

```

<?xml version="1.0" ?>
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- Documentation/CatalogManager/deleterowXML
-->
<SETVAR NAME="errno" VALUE="0"/>

<CATALOGMANAGER>
    <ARGUMENT NAME="ftcmd" VALUE="deleterow"/>
    <ARGUMENT NAME="tablename" VALUE="EmployeeInfo"/>
    <ARGUMENT NAME="tablekey" VALUE="name"/>
    <ARGUMENT NAME="tablekeyvalue" VALUE="Variables.EmployeeName"/>

```

```
</CATALOGMANAGER>
```

```
errno=<CSVAR NAME="Variables.errno"/><br/>
</FTCS>
```

### deleterowJSP

This is the code in the JSP version of the element:

```
<%@ taglib prefix="cs" uri="futuretense_cs/ftcs1_0.tld" %>
<%@ taglib prefix="ics" uri="futuretense_cs/ics.tld" %>
<%//
// Documentation/CatalogManager/deleterowJSP
//%>
<%@ page import="COM.FutureTense.Interfaces.*" %>
<%@ page import="COM.FutureTense.Util.ftMessage"%>
<%@ page import="COM.FutureTense.Util.ftErrors" %>
<cs:ftcs>

<!-- user code here -->
<!-- user code here -->
<ics:setvar name="errno" value="0"/>
<ics:catalogmanager>
    <ics:argument name="ftcmd" value="deleterow"/>
    <ics:argument name="tablename" value="EmployeeInfo"/>
    <ics:argument name="name"
        value='<%=ics.GetVar("EmployeeName")%>' />
</ics:catalogmanager>

errno=<ics:getvar name="errno"/><br />

</cs:ftcs>
```

### deleterowJAVA

This is the code in the Java version of the element:

```
<%@ taglib prefix="cs" uri="futuretense_cs/ftcs1_0.tld" %>
<%//
// Documentation/CatalogManager/deleterowJAVA
//%>
<%@ page import="COM.FutureTense.Interfaces.*" %>
<%@ page import="COM.FutureTense.Util.ftMessage"%>
<%@ page import="COM.FutureTense.Util.ftErrors" %>
<cs:ftcs>

<%
ics.SetVar("errno","0");
FTValList vl = new FTValList();
vl.put("ftcmd","deleterow");
vl.put("tablename","EmployeeInfo");
vl.put("name",ics.GetVar("EmployeeName"));
ics.CatalogManager(vl);
%>
errno=<%=ics.GetVar("errno")%><br />
```

```
</cs:ftcs>
```

## Querying a Table

The following sample elements query the fictitious `EmployeeInfo` table for an employee's name, extract the employee name and displays it in a browser, prompts the user to edit the information, and then writes the edited information to the database.

This section presents code from the following elements:

- `SelectNameForm`, an XML element that displays a form that requests an employee's name.
- Three versions of the `QueryEditRowForm` element (XML, JSP, and Java), an element that locates the employee name and loads the information about that employee into a form that the employee can use to edit his or her information
- Three versions of the `QueryEditRow` element (XML, JSP, and Java), an element that writes the newly edited information to the database.

## The SelectNameForm Element

The `SelectNameForm` element displays a simple form that requests the name of the employee who is altering his employee information. This is the code:

```
<?xml version="1.0" ?>
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- Documentation/CatalogManager/SelectNameForm
-->

<form ACTION="ContentServer" method="post">
<input type="hidden" name="pagename" value="Documentation/
CatalogManager/QueryEditRowForm"/>
<TABLE>
<TR>
  <TD>Employee name: </TD>
  <TD><INPUT type="text" value="" name="EmployeeName" size="22"
    maxlength="32"/></TD>
</TR>
<TR>
  <TD COLSPAN="100%" ALIGN="CENTER">
    <input type="submit" name="doit" value="Submit"/></TD>
</TR>
</TABLE>
</form>
</FTCS>
```

When the employee clicks the **Submit** button, the information gathered in the **Employee Name** field and the name of the `QueryEditRowForm` page (see the first `input type` statement in the preceding code sample) is sent to the browser.

The browser sends the `pagename` to Content Server. Content Server looks up the `pagename` in the `SiteCatalog` table, and then invokes that page entry's root element, `QueryEditRowForm`.

## The Root Element for the QueryEditRowForm Page

The root element for the QueryEditRowForm page locates the row in the EmployeeInfo table that matches the string entered in the **Employee Name** field and then loads the data from that row into a new form. The employee can edit her name and phone number but cannot edit her id. The form looks like this:

**Change Employee Information**

Employee id number:	12543
Employee name:	<input type="text" value="Mischa Elfant"/>
Phone number:	<input type="text" value="781 555 1213"/>
<input type="button" value="Change"/>	

There can only be one root element for a Content Server page (that is, an entry in the SiteCatalog table). This section shows three versions of the root element for the QueryEditRowForm page:

- QueryEditRowFormXML.xml
- QueryEditRowFormJSP.jsp
- QueryEditRowFormJAVA.jsp

### QueryEditRowFormXML

This is the code in the XML version of the element:

```
<?xml version="1.0" ?>
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- Documentation/CatalogManager/QueryEditRowFormXML
-->

<SETVAR NAME="errno" VALUE="0"/>
<SETVAR NAME="name" VALUE="Variables.EmployeeName"/>
<SELECTTO FROM="EmployeeInfo"
    WHERE="name"
    WHAT="*"
    LIST="MatchingEmployees"/>

<IF COND="Variables.errno=0">
<THEN>
    <form ACTION="ContentServer" method="post">
    <input type="hidden" name="pagename" value="Documentation/
CatalogManager/QueryEditRow"/>
    <input type="hidden" name="MatchingID"
value="MatchingEmployees.id" REPLACEALL="MatchingEmployees.id"/
    >
    <TABLE>
    <TR>
        <TD COLSPAN="100%" ALIGN="CENTER">
            <H3>Change Employee Information</H3>
        </TD>
```

```

</TR>
<TR>
    <TD>Employee id number: </TD>
    <TD><CSVAR NAME="MatchingEmployees.id"/></TD>
</TR>
<TR>
    <TD>Employee name: </TD>
    <TD><INPUT type="text" value="MatchingEmployees.name"
name="NewEmployeeName" size="22" maxlength="32"
REPLACEALL="MatchingEmployees.name"/></TD>
</TR>
<TR>
    <TD>Phone number: </TD>
    <TD><INPUT type="text" value="MatchingEmployees.phone"
name="NewEmployeePhone" size="12" maxlength="16"
REPLACEALL="MatchingEmployees.phone"/></TD>
</TR>
<TR>
    <TD colspan="100%" align="center">
        <input type="submit" name="doit" value="Change"/></TD>
</TR>
</TABLE>
</form>
</THEN>
<ELSE>
    <P>Could not find this employee.</P>
    <CALLELEMENT NAME="Documentation/CatalogManager/
SelectNameFormXML"/>
</ELSE>
</IF>
</FTCS>

```

When the employee clicks the **Change** button, the information gathered from the two fields and the name of the `QueryEditRow` page is sent to the browser.

The browser sends the pagename and the field information to Content Server. Content Server looks up the pagename in the `SiteCatalog` table, and then invokes that page entry's root element.

### QueryEditRowFormJSP

This is the code in the JSP version of the element:

```

<%@ taglib prefix="cs" uri="futuretense_cs/ftcs1_0.tld" %>
<%@ taglib prefix="ics" uri="futuretense_cs/ics.tld" %>
<%//
// Documentation/CatalogManager/QueryEditRowFormJSP
//%>
<%@ page import="COM.FutureTense.Interfaces.*" %>
<%@ page import="COM.FutureTense.Util.ftMessage"%>
<%@ page import="COM.FutureTense.Util.ftErrors" %>
<cs:ftcs>

<ics:setvar name="errno" value="0"/>
<ics:setvar name="name" value='<%=ics.GetVar("EmployeeName")%>' />

```



```

<ics:selectto table="EmployeeInfo"
  where="name"
  what="*"
  listname="MatchingEmployees"/>

<ics:if condition='<%=ics.GetVar("errno").equals("0")%>'>
<ics:then>
  <form action="ContentServer" method="post">
    <input type="hidden" name="pagename" value="Documentation/
    CatalogManager/QueryEditRow"/>
    <input type="hidden" name="MatchingID" value="<ics:listget
    listname='MatchingEmployees' fieldname='id'>"/>"/>
    <TABLE>
    <TR>
      <TD COLSPAN="100%" ALIGN="CENTER">
        <H3>Change Employee Information</H3>
      </TD>
    </TR>
    <TR>
      <TD>Employee id number: </TD>
      <TD><ics:listget listname='MatchingEmployees'
      fieldname='id'>"/></TD>
    </TR>
    <TR>
      <TD>Employee name: </TD>
      <TD><INPUT type="text" value="<ics:listget
      listname='MatchingEmployees' fieldname='name'>"/>"
      name="NewEmployeeName" size="22" maxlength="32"/></TD>
    </TR>
    <TR>
      <TD>Phone number: </TD>
      <TD><INPUT type="text" value="<ics:listget
      listname='MatchingEmployees' fieldname='phone'>"/>"
      name="NewEmployeePhone" size="12"
      maxlength="16"/>
    </TD>
    </TR>
    <TR>
      <TD colspan="100%" align="center">
        <input type="submit" name="doit" value="Change"/></TD>
    </TR>
    </TABLE>
  </form>
</ics:then>
<ics:else>
  <P>Could not find this employee.</P>
  <ics:callelement element="Documentation/CatalogManager/
  SelectNameForm"/>
</ics:else>
</ics:if>

</cs:ftcs>

```

When the employee clicks the **Change** button, the information gathered from the two fields and the name of the `QueryEditRow` page is sent to the browser.

The browser sends the pagename and the field information to Content Server. Content Server looks up the pagename in the `SiteCatalog` table, and then invokes that page entry's root element.

### QueryEditRowFormJAVA

This is the code in the Java version of the element:

```
<%@ taglib prefix="cs" uri="futuretense_cs/ftcs1_0.tld" %>
<%//
// Documentation/CatalogManager/QueryEditRowFormJAVA
<%@ taglib prefix="cs" uri="futuretense_cs/ftcs1_0.tld" %>
<%//
// Documentation/CatalogManager/QueryEditRowFormJAVA
//%>
<%@ page import="COM.FutureTense.Interfaces.*" %>
<%@ page import="COM.FutureTense.Util.ftMessage"%>
<%@ page import="COM.FutureTense.Util.ftErrors" %>
<cs:ftcs>

<!-- user code here -->
<%
ics.SetVar("errno","0");
ics.SetVar("name",ics.GetVar("EmployeeName"));
StringBuffer errstr = new StringBuffer();
IList matchingEmployees = ics.SelectTo("EmployeeInfo",// tablename
                                     "*", // what
                                     "name", // where
                                     "name", // orderby
                                     1, // limit
                                     null, // ics list name
                                     true, // cache?
                                     errstr); // error StringBuffer

if ("0".equals(ics.GetVar("errno")) && matchingEmployees!=null &&
matchingEmployees.hasData())
{
    %>
    <form action="ContentServer" method="post">
    <input type="hidden" name="pagename"
value="Documentation/CatalogManager/QueryEditRow"/>
    <%
    String id = matchingEmployees.getValue("id");
    String name = matchingEmployees.getValue("name");
    String phone = matchingEmployees.getValue("phone");
    %>
    <input type="hidden" name="MatchingID" value="<%=id%>"/>
    <TABLE>
    <TR>
        <TD COLSPAN="100%" ALIGN="CENTER">
            <H3>Change Employee Information</H3>
```

```

        </TD>
    </TR>
    <TR>
        <TD>Employee id number: </TD>
        <TD><%=id%></TD>
    </TR>
    <TR>
        <TD>Employee name: </TD>
        <TD><INPUT type="text" value="<%=name%>"
name="NewEmployeeName" size="22" maxlength="32" /></TD>
    </TR>
    <TR>
        <TD>Phone number: </TD>
        <TD><INPUT type="text" value="<%=phone%>"
name="NewEmployeePhone" size="12" maxlength="16" /></TD>
    </TR>
    <TR>
        <TD colspan="100%" align="center">
            <input type="submit" name="doit" value="Change" /></TD>
    </TR>
</TABLE>
</form>

<%
}
else
{
    %>    <P>Could not find this employee.</P>
<%
        ics.CallElement("Documentation/CatalogManager/
SelectNameForm",null);
}
%>
</cs:ftcs>

```

When the employee clicks the **Change** button, the information gathered from the two fields and the name of the `QueryEditRow` page is sent to the browser.

The browser sends the pagename and the field information to Content Server. Content Server looks up the pagename in the `SiteCatalog` table, and then invokes that page entry's root element.

## The Root Element for the `QueryEditRow` Page

The root element for the `QueryEditRow` page writes the information that the employee entered into the **Employee Name** and **Phone number** fields and updates the row in the database.

There can only be one root element for a Content Server page (that is, an entry in the `SiteCatalog` table). This section shows three versions of the root element for the `QueryEditRow` page:

- `QueryEditRowXML.xml`
- `QueryEditRowJSP.jsp`
- `QueryEditRowJAVA.jsp`

**QueryEditRowXML**

This is the code in the XML version of the element:

```
<?xml version="1.0" ?>
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- Documentation/CatalogManager/QueryEditRowXML
-->

<SETVAR NAME="errno" VALUE="0"/>

<CATALOGMANAGER>
  <ARGUMENT NAME="ftcmd" VALUE="updaterow"/>
  <ARGUMENT NAME="tablename" VALUE="EmployeeInfo"/>
  <ARGUMENT NAME="id" VALUE="Variables.MatchingID"/>
  <ARGUMENT NAME="name" VALUE="Variables.NewEmployeeName"/>
  <ARGUMENT NAME="phone" VALUE="Variables.NewEmployeePhone"/>
</CATALOGMANAGER>

<IF COND="Variables.errno=0">
<THEN>
  <P>Successfully updated the database.</P>
</THEN>
<ELSE>
  <P>Failed to update the information in the database.</P>
</ELSE>
</IF>
</FTCS>
```

**QueryEditRowJSP**

This is the code in the JSP version of the element:

```
<%@ taglib prefix="cs" uri="futuretense_cs/ftcs1_0.tld" %>
<%@ taglib prefix="ics" uri="futuretense_cs/ics.tld" %>
<%//
// Documentation/CatalogManager/QueryEditRowJSP
//%>
<%@ page import="COM.FutureTense.Interfaces.*" %>
<%@ page import="COM.FutureTense.Util.ftMessage"%>
<%@ page import="COM.FutureTense.Util.ftErrors" %>
<cs:ftcs>

<ics:setvar name="errno" value="0"/>

<ics:catalogmanager>
  <ics:argument name="ftcmd" value="updaterow"/>
  <ics:argument name="tablename" value="EmployeeInfo"/>
  <ics:argument name="id"
value="<%=ics.GetVar("MatchingID")%>" />
  <ics:argument name="name"
value='<%=ics.GetVar("NewEmployeeName")%>' />
  <ics:argument name="phone"
value='<%=ics.GetVar("NewEmployeePhone")%>' />
```

```

</ics:catalogmanager>

<ics:if condition='<%=ics.GetVar("errno").equals("0")%>'>
<ics:then>
    <P>Successfully updated the database.</P>
</ics:then>
<ics:else>
    <p>failed to update the information in the database.
    errno=<ics:getvar name='errno' /></p>
</ics:else>
</ics:if>

</cs:ftcs>

```

### QueryEditRowJAVA

This is the code in the Java version of the element:

```

<%@ taglib prefix="cs" uri="futuretense_cs/ftcs1_0.tld" %>
<%//
// Documentation/CatalogManager/QueryEditRowJAVA
//%>
<%@ page import="COM.FutureTense.Interfaces.*" %>
<%@ page import="COM.FutureTense.Util.ftMessage"%>
<%@ page import="COM.FutureTense.Util.ftErrors" %>
<cs:ftcs>

<!-- user code here -->
<%
ics.SetVar("errno","0");

FTValList args = new FTValList();
args.put("ftcmd","updaterow");
args.put("tablename","EmployeeInfo");
args.put("id",ics.GetVar("MatchingID"));
args.put("name",ics.GetVar("NewEmployeeName"));
args.put("phone",ics.GetVar("NewEmployeePhone"));

ics.CatalogManager(args);

if("0".equals(ics.GetVar("errno")))
{
    %><P>Successfully updated the database.</P><%
}
else
{
    %><p>failed to update the information in the database.
    errno=<ics:getvar name='errno' /></p><%
}
%>
</cs:ftcs>

```

## Querying a Table with an Embedded SQL Statement

The following example shows another method of searching for a name in a table. This example also searches the fictitious `EmployeeInfo` table, returning the rows that match the string supplied by a user, but this time the code uses a SQL query rather than a `SELECT` statement.

This section presents code from the following elements:

- `QueryInlineSQLForm`, an XML element that displays a form that requests a movie title
- Three versions of the `QueryInlineSQL` element (XML, JSP, and Java), an element that searches the `EmployeeInfo` table for names that contain the string entered by the user in the preceding form

### QueryInlineSQLForm

The `QueryInlineSQL` element displays a simple form that requests the name to use to search the `EmployeeInfo` table for. This is the code:

```
<?xml version="1.0" ?>
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- Documentation/CatalogManager/QueryInlineSQLForm
-->
<form ACTION="ContentServer" method="post">
<input type="hidden" name="pagename" value="Documentation/
CatalogManager/QueryInlineSQL"/>

<table>
<tr>
        <td>Employee Name:</td>
        <td><input type="text" value="Foo,Bar"
        name="EmployeeName" size="22" maxlength="32"/></td>
</tr>
<tr>
        <td colspan="2"><input type="submit" name="submit"
        value="submit"/></td>
</tr>
</table>

</form>
</FTCS>
```

When the user clicks the **Submit** button, the information gathered in the **Employee Name** field and the name of the `QueryInlineSQL` page is sent to the browser.

The browser sends the `pagename` of the `QueryInlineSQL` page to Content Server. Content Server looks up the `pagename` in the `SiteCatalog` table, and then invokes that page entry's root element.

### The Root Element for the QueryInlineSQL Page

The root element for the `QueryInlineSQL` page executes an inline SQL statement that searches the `EmployeeInfo` table for entries that match the string sent to it from the `QueryInlineSQLForm` element.

There can only be one root element for a Content Server page (that is, an entry in the SiteCatalog table). This section shows three versions of the root element for the QueryInlineSQL page:

- QueryInlineSQLXML.xml, which uses the EXECSQL XML tag to create the SQL query
- QueryInlineSQLJSP.jsp, which uses the ics:sql JSP tag to create the SQL query
- QueryInlineSQLJAVA.jsp, which uses the ics.CallSQL Java method to create the SQL query

### QueryInlineSQLXML

This is the code in the XML version of the element:

```
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- Documentation/CatalogManager/QueryInlineSQLXML
-->

<SETVAR NAME="tablename" VALUE="EmployeeInfo"/>

<SQLEXP OUTSTR="MySQLExpression"
        TYPE="OR"
        VERB="LIKE"
        STR="Variables.EmployeeName"
        COLNAME="name" />

<EXECSQL
        SQL="SELECT id,name,phone FROM Variables.tablename WHERE
        Variables.MySQLExpression"
        LIST="ReturnedList"
        LIMIT="5" />

<table border="1" bgcolor="99ccff">
<tr>
        <th>id</th>
        <th>name</th>
        <th>phone</th>
</tr>

<LOOP LIST="ReturnedList">
        <tr>
                <td><CSVAR NAME="ReturnedList.id"/></td>
                <td><CSVAR NAME="ReturnedList.name"/></td>
                <td><CSVAR NAME="ReturnedList.phone"/></td>
        </tr>
</LOOP>
</table>

</FTCS>
```

Notice that the SQL statement is not actually embedded in the EXECSQL tag. Instead, a preceding SQLEXP tag creates a SQL expression which is passed as an argument to the

EXECSQL call. The EXECSQL tag performs the search and returns the results to the list variable named ReturnedList.

Also notice that the first line of code in the body of the element creates a variable named tablename and sets the value to EmployeeInfo, the name of the table that is being queried. This enables CatalogManager to cache the resultset against the correct table.

### QueryInlineSQLJSP

This is the code in the JSP version of the element:

```
<?xml version="1.0" ?>
<%@ taglib prefix="cs" uri="futuretense_cs/ftcs1_0.tld" %>
<%@ taglib prefix="ics" uri="futuretense_cs/ics.tld" %>
<%//
// Documentation/CatalogManager/QueryInlineSQLJSP
//%>
<%@ page import="COM.FutureTense.Interfaces.*" %>
<%@ page import="COM.FutureTense.Util.ftMessage"%>
<%@ page import="COM.FutureTense.Util.ftErrors" %>
<cs:ftcs>

<!-- user code here -->
<ics:setvar name="tablename" value="EmployeeInfo"/>

<%
// no ics:sqlexp tag, must do in java
String sqlexp =
ics.SQLExp("EmployeeInfo", "OR", "LIKE", ics.GetVar("EmployeeName"), "
name");
String sql = "SELECT id,name,phone FROM
"+ics.GetVar("tablename")+ " WHERE "+sqlexp;
%>
<ics:sqltable='<%=ics.GetVar("tablename")%>'
               sql='<%=sql%>'
               listname="ReturnedList"
               limit="5"/>

<table border="1" bgcolor="99ccff">
<tr>
    <th>id</th>
    <th>name</th>
    <th>phone</th>
</tr>

<ics:listloop listname="ReturnedList">
    <tr>
        <td><ics:listget listname="ReturnedList" fieldname="id"/></td>
        <td><ics:listget listname="ReturnedList" fieldname="name"/></td>
        <td><ics:listget listname="ReturnedList" fieldname="phone"/></td>
    </tr>
</ics:listloop>
```



```
</table>
```

```
</cs:ftcs>
```

Notice that the SQL statement is not actually embedded in the `ics:sql` tag. Instead, a preceding Java expression creates a SQL expression that is passed as an argument to the `ics:sqlcall`. (The code example uses Java because there is no JSP equivalent of the `SQLEXP` tag.) The `ics:sql` tag performs the search and returns the results to the list variable named `ReturnedList`.

Also notice that the first line of code in the body of the element creates a variable named `tablename` and sets the value to `EmployeeInfo`, the name of the table that is being queried. This enables `CatalogManager` to cache the resultset against the correct table.

### QueryInlineSQLJava

This is the code in the Java version of the element:

```
<%@ taglib prefix="cs" uri="futuretense_cs/ftcs1_0.tld" %>
<%//
// Documentation/CatalogManager/QueryInlineSQLJAVA
//%>
<%@ page import="COM.FutureTense.Interfaces.*" %>
<%@ page import="COM.FutureTense.Util.ftMessage"%>
<%@ page import="COM.FutureTense.Util.ftErrors" %>
<cs:ftcs>

<%

ics.SetVar("tablename","EmployeeInfo");

String sqlexp = ics.SQLExp(ics.GetVar("tablename"),"OR","LIKE",
ics.GetVar("EmployeeName"),"name");
String sql = "SELECT id,name,phone FROM
"+ics.GetVar("tablename")+ " WHERE "+sqlexp;
StringBuffer errstr = new StringBuffer();

IList list =
ics.SQL(ics.GetVar("tablename"),sql,null,5,true,errstr);

%>

<table border="1" bgcolor="99ccff">
<tr>
    <th>id</th>
    <th>name</th>
    <th>phone</th>
</tr>

<%

while (true)
{
%>
```

```

        <tr>
            <td><%=list.getValue("id")%></td>
            <td><%=list.getValue("name")%></td>
            <td><%=list.getValue("phone")%></td>
        </tr>
    <%
        if (list.currentRow() == list.numRows())
            break;
        list.moveTo(list.currentRow()+1);
    %>

</table>
</cs:ftcs>

```

Notice that the SQL statement is not actually embedded in the `ics.SQL` statement. Instead, a preceding `ics.SQLExp` statement creates a SQL expression which is passed as an argument to the `EXECSQL` call. The `ics.SQL` statement performs the search and returns the results to the list variable named `ReturnedList`.

Also notice that this code also creates a variable named `tablename` and sets the value to `EmployeeInfo` (the name of the table that is being queried), before the code for the query. This enables `CatalogManager` to cache the resultset against the correct table.

## Managing the Data Manually

You can add data to a table manually with either the Content Server Explorer tool or the forms in the Content Server Management Tools.

Content Server Explorer is the right choice in the following situations:

- If you are creating a page entry for a new page in the `SiteCatalog` table.
- If you are creating a row for an element in the `ElementCatalog` table and are coding that element with the editor in Content Server Explorer.
- If you need to add a small amount of data to a table that you have created to support some function of your site. That is, to add a small amount of data to a table that does not hold assets. (For example, to add rows to the `MimeType` table.)

Content Server Explorer has online help that you can use if you need information about adding, editing, or deleting rows. Additionally, Chapter 3, “Programming with CSEE,” in this guide describes how to add page entries to the `SiteCatalog` table and elements to the `ElementCatalog` table.

The Content Server Management Tools are the right choice in the following situations:

- To add users or ACLs to the system.
- When you want to modify the cache settings for a page entry in the `SiteCatalog` table. Typically it is easier to complete this task in the **ContentManagement** form than it is to enter the information directly into the column using Content Server Explorer.

The Content Server Management Tools are documented in the *CSEE Administrator's Guide*.

## Deleting Non-Asset Tables

Note that if you delete a non-asset table that is being revision tracked from the database, the tracking table will not be removed. To prevent this, be sure that you disable revision tracking for the table before deleting it.



## Chapter 12

# Resultset Caching and Queries

The CatalogManager servlet (and its API) maintains the resultset cache on your Content Server systems. This chapter describes how to enable resultset caching and how to create queries that allow CatalogManager to accurately cache resultsets and to then flush those resultsets from the cache.

You or your system administrators set up resultset caching on all three systems (development, management, and delivery).

This chapter contains the following sections:

- Overview
- How Content Server Identifies a Resultset
- Specifying the Table Name
- Flushing the Resultset Cache
- Enabling Resultset Caching
- Summary

## Overview

Whenever the database is queried, the Content Server serves a resultset—either a cached resultset or an uncached resultset. Resultset caching reduces the load on your database and improves the response time for queries.

The `futuretense.ini` file provides global properties that set the size and timeout periods for all resultsets. You can add table-specific properties to the `futuretense.ini` file that override the default settings on a table-by-table basis. These custom properties enable you to fine-tune your systems for peak performance.

## Database Queries

There are several ways to query the Content Server database for information. For example:

- With the `ics.SelectTo` Java method, `SELECTTO` XML tag, or `ics:selectto` JSP tag
- With the `selectrow` command of the `ics.CatalogManager` Java method, the `CATALOGMANAGER` XML tag, and the `ics:catalogmanager` JSP tag
- With the `ics.SQL` Java method, `EXECSQL` XML tag, or `ics:sql` JSP tag
- With the `ics.CallSQL` Java method, `CALLSQL` XML tag, or `ics:callsql` JSP tag
- Through the **Search** forms in the Content Server interface
- With a query asset
- With a `SEARCHSTATE` XML or JSP tag (flex assets only)

## How Resultset Caching Works

When the database is queried, the resultset from the query is cached if resultset caching is enabled. Then, if someone runs the same query and the data in the table has not changed since the last time the query was run, Content Server serves the information from the resultset cache rather than querying the database again.

Serving a resultset from the cache is always faster than performing another database lookup.

The resultset cache is a hash table held in Java memory. The resultsets in this hash table are organized by the name of the table that was associated with the query that generated the resultset. In other words, resultsets are cached against a table name.

Each time a table is updated (from either the Content Server interface or through a `CatalogManager` command in your custom elements), all the resultsets in the cache for that table are flushed. Resultsets are cached in the context of a single Java VM. Although Java VMs do not share resultsets, Content Server sends a signal to all the Java VMs in a cluster to flush the resultsets when they become invalid, as long as the synchronization feature has been enabled on all servers in the cluster (the `ft.synch` property in the `futuretense.ini` file).

## Reducing the Load on the Database

Resultset caching reduces the load on your database in two ways:

- Serving a cached resultset does not open a database connection. Content Server attempts to obtain a resultset from the cache before it contacts the database. If the correct resultset exists, no contact is made with the database.
- When resultset caching is enabled but the appropriate resultset is not cached, Content Server obtains the resultset, stores it in the cache as an object, and then releases the database connection.

When resultset caching is not enabled, Content Server cannot close the database connection until either the online page is completely rendered or the uncached resultset is explicitly flushed from the scope with a `flush` tag. When this occurs, your available database connections can be quickly used up (even on a relatively simple page).

As a general rule, resultset caching should be enabled for all of your database tables. Although there are times when you might need to limit either the number of resultsets that are cached or the length of time that they are cached for, it is rarely a good idea to disable resultset caching altogether.

### Note

Never disable resultset caching on the `ElementCatalog` table. If you do, the performance of your system will suffer greatly, especially if you are using JSP in any of your elements.

## How Content Server Identifies a Resultset

The resultset cache is a hash table and the key that identifies an individual resultset for a given table name is the combination of the values of two database connection properties plus the text string of the query itself.

For example, the hash name used to identify a resultset from a table in the Content Server database is created as follows:

The value of the `cs.dsn` property from the `futuretense.ini` file + the value of the `cs.privuser` property from the `futuretense.ini` file + the actual query string.

If you query a remote database (remember that you must first use the `ics.LoadProperty` method or the `LOADPROPERTY` tag to specify the property file that identifies that remote database before the statement of the query), the hash name is created with the `cs.dns` and `cs.privuser` properties from the property file used to identify that database.

This means that if you run queries against a remote database and any of the table names are the same as a table name in the Content Server database, the hash names of the resultsets for those queries will be different even though they will be listed under the same table name in the cache (that is, the hash map is the same). This means that Content Server can flush the correct resultset when a table is updated.

If you do not load the property file for another database before running the query, Content Server assumes that it is connecting to the Content Server database.

## Specifying the Table Name

There must always be a table name associated with a query so that the resultset can be cached against that table. Then, whenever that table is updated through the Content Server interface or your own custom elements, CatalogManager flushes all the resultsets associated with that table.

The way that the table name is specified for a resultset depends on the type of query you are running. The following sections describe the most commonly used methods for querying the database and how you specify the table name for such a query.

### SELECTTO

When you use the `ics.SelectTo` Java method, `SELECTTO` XML tag, or `ics:selectto` JSP tag, you must specify the name of the table with a `FROM` parameter (clause). For example:

```
<SELECTTO FROM="EmployeeInfo"
        WHERE="name"
        WHAT="*"
        LIST="MatchingEmployees"/>
```

In this case, `EmployeeInfo` is the name of the table that is being queried and is the name of the table that the resultset is cached against. Whenever the `EmployeeInfo` table is updated, CatalogManager flushes all the resultsets cached against it.

### EXECSQL

`EXECSQL` allows you to execute an inline SQL statement. You specify the table or tables that you want to cache the resultset against using the `TABLE` parameter. If you specify multiple tables (by using a comma-separated list), the resultset will be cached against the first table in the list. Note that this means the resultset will be cached based on the resultset cache settings specified for the first table, including timeout and maximum size.

CatalogManager deletes outdated resultsets as the specified tables are updated.

For example, the following query caches the resultset against the article table:

```
<EXECSQL SQL="SELECT article.headline, images.imagefile FROM
article,images WHERE article.id='FTX1EE17FWB' AND
images.id='FTK9384FWW'" LIST="sqlresult" TABLE="article,images"/>
```

### CALLSQL

When you use the `ics.CallSQL` Java method, `CALLSQL` XML tag, or `ics:callsql` JSP tag to invoke a SQL query that is stored in the `SystemSQL` table, the table name is set by the query's entry (row) in the `SystemSQL` table.

The `SystemSQL` table has a `deftable` column that identifies the table name that the resultset from the query should be cached against. You can specify multiple tables by putting a comma-separated list of tables in the `deftable` column. The first table in the list is the table that the query is cached against.

Each query stored in the table must have a value in the `deftable` column. If it does not, CatalogManager cannot store the resultsets accurately, which means they cannot be flushed when it is necessary. Note that the table name must identify an existing table. If



you enter the name of a table that does not exist yet or if you misspell the name of the table, the resultset cannot be cached correctly.

## Search Forms in the Content Server Interface

The **Search** forms that you use to look for assets in the Content Server interface search by asset type. The resultsets from the search form queries are stored against the primary storage table for assets of that type.

For example, for the Burlington Financial sample site asset named article, those resultsets are cached against the `Article` table; for page assets, it is the `Page` table; and so on.

## Query Asset

Query assets can return assets of one type only. When you create a query asset, you specify what kind of asset the query asset returns in the **Result of Query** field: articles, or imagefiles and so on.

When that query asset is used on a page in the online site, Content Server stores the resultset against the table name of the primary storage table for the asset type that the query asset returns: `Article` or `Imagefile`, and so on.

## SEARCHSTATE

The CS-Direct Advantage `SEARCHSTATE` XML and JSP tags create a set of search constraints that are applied to a list or set of flex assets (created with the `ASSETSET` tags). A constraint can be either a filter (restriction) based on the value of an attribute or based on another searchstate (called a nested searchstate).

You use the `SEARCHSTATE` and `ASSETSET` tags to extract and display flex assets or flex parent assets (not definitions or flex attributes) on your online pages for your visitors.

Content Server caches the resultsets of searchstates against the `_Mungo` table for the flex asset type. For example, if the searchstate returns the GE Lighting sample site flex asset named product, the resultset is cached against the `Products_Mungo` table.

When you configure the delivery system, be sure to add resultset caching properties for all of your `_Mungo` tables.

## Flushing the Resultset Cache

In most cases, data is written to the database through the `CatalogManager` API, which flushes the resultset cache when it is appropriate to do so. For example:

- If you use Content Server Explorer to add a row to a table (the `SiteCatalog` table or the `ElementCatalog` table, for example), `CatalogManager` flushes all the resultsets cached against that table.
- If you use a form in the Content Server interface to add or edit an asset, a source, a category, a workflow process, a user, an ACL and so on, `CatalogManager` flushes the resultsets cached against the tables that are written to.
- If you use `CatalogManager` commands in an element of your own to update a single table, `Catalog Manager` automatically flushes the resultsets cached against that table.

- If you use CatalogManager commands in an element of your own to update multiple (joined) tables, Catalog Manager automatically flushes the resultsets cached against the joined tables.
- If you use the CALLSQL tag to execute a SQL statement that is stored in the SystemSQL table, Catalog Manager automatically updates the resultsets cached against the table or tables specified in the deftable column.

## Enabling Resultset Caching

The following table presents the three properties in the `futuretense.ini` file that control the resultset cache for all tables that you have not added table-specific caching properties for:

property	description
<code>cc.cacheResults</code>	<p>The default number of resultsets to cache in memory. Note that this does not mean the number of records in a resultset, but the number of resultsets.</p> <p>Setting this value to -1 disables resultset caching for all tables that do not have their own caching properties configured.</p>
<code>cc.cacheResultsTimeout</code>	<p>The default amount of time (number of minutes) to keep a resultset cached in memory.</p> <p>Setting this value to -1 means that there is no timeout value for tables that do not have their own caching properties configured.</p>
<code>cc.cacheResultsAbs</code>	<p>How to calculate the expiration time.</p> <p>If the value is set to <code>true</code>, the expiration time for a resultset is absolute. If the timeout is set to 5 minutes, then 5 minutes after it was cached, it is flushed.</p> <p>If the value is set to <code>false</code>, the expiration time for a resultset is based on its idle time. For example, if the timeout is set to 5 minutes, it is flushed 5 minutes after the last time it was requested rather than 5 minutes since it was originally cached.</p>

To change these properties, open the `futuretense.ini` file with the Property Editor utility and modify them. For information about using the Property Editor utility, see Chapter 5, “CSEE Tools and Utilities.”

## Table-Specific Properties

CatalogManager not only uses the properties described in the preceding table, it also checks the `futuretense.ini` file to see if there are any custom resultset caching properties for specific tables.

You can create three resultset caching properties for each table in the Content Server database. They work the same way as do the default properties defined in the table in the preceding section. All system tables have these properties set for them.

The syntax for your custom properties is as follows:

```
cc.<tablename>Csz=<number of resultsets>
cc.<tablename>Timeout=<number of minutes>
cc.<tablename>Abs=<true or false>
```

These custom properties enable you to fine-tune your systems for peak performance.

Open the `futuretense.ini` file in the Property Editor utility and add table-specific properties for each table that you want to control. (For information about using the Property Editor utility, see Chapter 5, “CSEE Tools and Utilities.”)

## Planning Your Resultset Caching Strategy

Before you configure resultset caching for your database, create a spreadsheet of all the tables in your Content Server database, assemble a team of developers and database administrators, and discuss what the settings should be for all of your systems—development, management, testing, and delivery.

One strategy to use is to identify a large group of similar tables that you can use the default properties for and then add table-specific properties for the exceptions.

To tune your delivery system for the best performance possible, however, it is likely that you will create a custom properties for each table in the database on that system—at the very least, 50-100 of them.

### Note

If you set the `ft.cachedebug` property to `yes`, debugging messages about the resultset cache are written to the `futuretense.txt` log file.

## Summary

Resultset caching reduces the load on your database and improves the response time for queries. Be sure to do the following:

- Set the default resultset caching properties in the `futuretense.ini` file to values that make sense on each of your systems—development, management, testing, and delivery.
- Add table-specific resultset caching properties to the `futuretense.ini` file to fine-tune the performance of all of your systems—development, management, testing, and delivery.
- Provide the correct table name for all of your queries so the resultsets are cached correctly and can be flushed correctly.



## Chapter 13

# Designing Basic Asset Types

As mentioned in Chapter 8, “Data Design: The Asset Models,” the data model for basic asset types is one database table per asset type. Each asset of that type is stored in that table.

You create new basic asset types with the AssetMaker utility. Typically you create them on a development system and then, when they are ready, you migrate your work from the development system to the management and delivery systems.

This chapter contains the following sections:

- The AssetMaker Utility
- Creating Basic Asset Types
- Deleting Basic Asset Types

## The AssetMaker Utility

**AssetMaker** is the CS-Direct utility that you use to create new basic asset types. You code an .xml file called an **asset descriptor file** using the AssetMaker XML tags, and then you upload the file with the AssetMaker utility

An asset descriptor file defines each of the properties for the new asset type. The term **property** means both a column in a database table and a field in a CS-Direct form. AssetMaker creates both a database table for the new asset type and the CS-Direct elements that generate the forms that you and others use when working with assets of the new type (creating, editing, copying, and so on).

### How AssetMaker Works

When you use AssetMaker to create a new basic asset type, there are four general steps:

1. Code the asset descriptor file.

This chapter describes asset descriptor files and coding them. The *CSEE Developer's Tag Reference* includes a chapter that describes all of the AssetMaker tags.

2. Upload the file.

When you upload the asset descriptor file, AssetMaker creates a row in the `AssetType` table and copies the asset descriptor file to that row.

3. Create the table.

When you click the **Create Asset Table** button, AssetMaker does the following:

- Parses the asset descriptor file.
- Creates the primary storage table for assets of that type. The name of the table matches the name of the asset type identified in the asset descriptor file. The data type of each column is defined by statements in the file as well.  
In addition to the columns defined in the asset descriptor file, AssetMaker creates default columns that CS-Direct needs to function correctly.
- Adds a row for the new table to the `SystemInfo` table.  
All asset tables are object tables so the value in the `systable` column is set to `obj`.  
All asset tables have URL columns so the value in the `defdir` column is set to the value that you specified either in the asset descriptor file or in the **DefDir** field in the **Create Asset Table** form when you create the asset type.
- If you have checked the **Add 'General' category** checkbox, Asset Maker adds one row to the `Category` table for the new asset type and names that category `General`.

4. Register the elements.

When you register the elements, AssetMaker does the following:

- Creates a subdirectory in the `ElementCatalog` table under `OpenMarket/Xcelerate/AssetType` directory for the new asset type.
- Copies elements from the `AssetStubCatalog` table to the new subdirectory in the `ElementCatalog` table. These elements render CS-Direct forms for working with assets of this type and provide the processing logic for the CS-Direct functions.

- Creates SQL statements that implement searches on individual fields in the search forms. These statements are placed in the `SystemSQL` table.

When you use CS-Direct to work on an asset of this type (create, edit, inspect, and so on), AssetMaker parses the asset descriptor file, which is now located in the `AssetType` table, and passes its values to CS-Direct so that the forms are specific to the asset type. Statements in the asset descriptor file determine the input types of the fields, specify field length restrictions, and determine whether the field is displayed on search and search results forms.

Note that after you create an asset type, there are several configuration steps to complete before you can use it; for example, enabling it on the sites that need to use it, creating Start Menu shortcuts, and so on.

## Asset Descriptor Files

Using the AssetMaker XML tags, you code asset descriptor files that define the asset types you design for your systems.

### What Is an Asset Descriptor File?

An asset descriptor file is a valid XML document that defines an asset type (a basic asset type). It does the following two things:

- Describes the asset type in terms of data structure: what are the data types and sizes of the fields, what is the name of the database table, and what are the names of the columns.
- Formats the HTML forms that are displayed in the CS-Direct window when you create or edit assets of this type: the names of the fields on the form, the number of characters that can be entered in a text field, whether the field is a check box or a set of radio buttons or has a drop-down list of values, and so on.

AssetMaker uses the asset descriptor file to determine the columns in the database table that it creates for the new asset type. AssetMaker also parses the asset descriptor file every time CS-Direct invokes a function for an asset of that type, using the data in it to customize the forms that CS-Direct displays.

### Format and Syntax

This is the basic format and syntax for every asset descriptor file:

```
<?xml version="1.0" ?>
<ASSET NAME="assetName" ...>
  <PROPERTIES>
    <PROPERTY NAME="fieldName1" DESCRIPTION="fieldName1"/>
      <STORAGE TYPE="VARCHAR" LENGTH="36"/>
      <INPUTFORM TYPE="TEXT"
DESCRIPTION="fieldName1" ...../>
      <SEARCHFORM TYPE="TEXT"
DESCRIPTION="fieldName1" .../>
      <SEARCHRESULTS INCLUDE="TRUE"/>
    </PROPERTY>
    <PROPERTY NAME="fieldName2" DESCRIPTION="fieldName2"/>
      <STORAGE TYPE="INTEGER" LENGTH="4"/>
      <INPUTFORM TYPE="TEXT" DESCRIPTION="fieldName2" .../>
```

```

        <SEARCHFORM TYPE="TEXT"
DESCRIPTION="fieldName2".../>
        <SEARCHRESULTS INCLUDE="TRUE"/>
    </PROPERTY>
</PROPERTIES>
</ASSET>

```

Note that the `PROPERTIES` tag, used in line 3, is required in every asset descriptor file, even if no `PROPERTY` tags are needed.

## Overview of the AssetMaker Tags

An asset descriptor file begins with the standard XML version tag:

```
<?xml version="1.0" ?>
```

The `ASSET` tag, which follows the XML version tag, names the asset type, provides the name of the database table for the asset type, and determines what graphical notation designates that a field is required. The opening tag is always the first line of code and the closing tag is always the last line of code in the asset descriptor file.

There is only one `ASSET` tag pair in each asset descriptor file because an asset descriptor file defines one asset type.

A pair of `PROPERTIES` tags marks the section of the file that holds the property descriptions. The opening tag is always the second statement in the asset descriptor file. There is only one `PROPERTIES` tag pair in each asset descriptor file.

Nested within the `PROPERTIES` tag pair are pairs of `PROPERTY` tags that define each property (field and column) for assets of this type. The `PROPERTY` tag provides both the name of the column in the database that holds the values entered for this field as well as the field name on the form that you use to create assets of this type.

Nested inside each pair of `PROPERTY` tags are the following tags:

- `STORAGE`, which determines the name and data type of the column. This value defines how field values are stored in the database.
- `INPUTFORM`, which determines the appearance of the field on the **Edit** and **Inspect** forms, its name and format. For example: is it a drop-down list or a check box or a text field? The `TYPE` specified by `INPUTFORM` must be compatible with the `TYPE` specified by `STORAGE`.
- `SEARCHFORM`, which determines whether the field is displayed on the CS-Direct **Advanced Search** form. Note that if the value of the `TYPE` parameter is "Table" or "Date", a drop down list will not appear on the SimpleSearch form, although it will appear in the Advanced Search form for the asset type.
- `SEARCHRESULTS`, which determines which field values appear in the search results form that CS-Direct displays after a search. By default, the field is not displayed unless `INCLUDE` is set to "TRUE". (This tag is optional.)

If you are modifying a standard field, do not set `SEARCHRESULTS` to true for name or description.

For information about these tags and the parameters for each, see the "AssetMaker Tags" chapter in the *CSEE Developer's Tag Reference*. That chapter also provides information about dependencies and restrictions between `STORAGE TYPE`, `INPUTFORM TYPE`, and `SEARCHFORM TYPE`.



## Columns in the Asset Type's Database Table

When AssetMaker creates the database table for the asset type, it creates columns for all the properties defined by the pairs of `PROPERTY` tags in the asset descriptor file.

However, CS-Direct needs several default columns for its basic functionality and so AssetMaker creates each of the default columns in the asset type's storage table in addition to the columns defined in the asset descriptor file for that asset type.

For a list of the default columns in each asset type's table, see "Default Columns in the Basic Asset Type Database Table" on page 173.

### The Source Column: A Special Case

All of the asset type tables can also have a `source` column. CS-Direct provides a `Source` table and a **Source** form on the **Admin** tab that you use to add the rows to the `Source` table. You can use this feature to identify where an asset originated. The Burlington Financial sample site, for example, uses `Source` to identify which wire feed service provided an article asset.

However, unlike the columns listed in the preceding table, the `source` column is not automatically created when AssetMaker creates the asset type table. To add the source column to your table and have it displayed on your asset forms, you must include a `PROPERTY` description for it in the asset descriptor file.

For an example, see "Example: Adding the Source Column and Field" on page 269.

### Storage Types for the Columns

The `STORAGE TYPE` parameter specifies the data type of a column. The data types are defined by the Content Server database properties located in the `futuretense.ini` file.

The following table presents the possible data types for your asset type's table columns:

Type (generic ODBC/JDBC data type)	Property
CHAR	cc.char
VARCHAR	cc.varchar
SMALLINT	cc.smallint
INTEGER	cc.integer
BIGINT	cc.bigint
DOUBLE	cc.double
TIMESTAMP	cc.datetime
BLOB	cc.blob
LONGVARCHAR	cc.bigtext

## Input Types for the Fields

The `INPUT TYPE` parameter specifies how data can be entered in a field when it is displayed in the CS-Direct forms. The following table lists all the input types. Note that the input type for a field must be compatible with the data type of its column:

Input TYPE	Description
TEXT	<p>A single line of text.</p> <p>Corresponds to the HTML input type named <code>TEXT</code>.</p>
TEXTAREA	<p>A text box, with scroll bars, that accepts multiple lines of text.</p> <p>Corresponds to the HTML input type named <code>TEXTAREA</code>.</p> <p>If you expect large amounts of text to be entered in the field, it is a good idea to create a text box that displays the contents of a URL column. To do so, you must specify a string for <code>PROPERTY NAME</code> that begins with the letters “url” and set the <code>STORAGE TYPE</code> to <code>VARCHAR</code>.</p> <p>When a user clicks <b>Save</b>, the text entered into this kind of field is stored in the file directory specified as the default storage directory for this asset type. You can specify the default storage directory (<code>defdir</code>) in either the asset descriptor file, or in the AssetMaker form when you create the asset type.</p> <p>Note that you can specify an unlimited size for a url field that is edited via a <code>TEXTAREA</code> field by not specifying a value for the <code>MAXLENGTH</code> parameter.</p>
UPLOAD	<p>A field that takes a file name (a URL) and presents a <b>Browse</b> button so that you can either enter the path to and name of a file or browse to it and select it.</p> <p>When you specify that a field is an upload field, set a string for <code>PROPERTY NAME</code> that begins with the letters “url” and set <code>STORAGE TYPE</code> (the property’s data type) to <code>VARCHAR</code>.</p> <p>You can also use the <code>BLOB</code> storage type for an upload field; in this case, the <code>PROPERTY NAME</code> string does not have to begin with url.</p> <p>When the user clicks <b>Save</b>, Content Server uploads the selected file and stores it in the file directory specified as the default storage directory for this asset type. You can specify the default storage directory (<code>defdir</code>) in either the asset descriptor file, or in the AssetMaker form when you upload the file.</p> <p>Note: the size of a file that is selected in an upload field cannot exceed 30 megabytes.</p>
SELECT	<p>A field that presents a drop-down list of options that can be selected.</p> <p>You can either specify the options that are presented in the list or you can specify a query so that the options are selected from the database (or an external table) and presented dynamically.</p> <p>Corresponds to the HTML input type <code>SELECT</code>.</p>

Input TYPE	Description
CHECKBOX	<p>A check box field.</p> <p>You can specify the names of the check box options or you can specify a query so that the names are selected from the database (or an external table) and presented dynamically. This input type allows the user to select more than one option.</p> <p>Corresponds to the HTML input type <code>CHECKBOX</code>.</p>
RADIO	<p>A radio button control.</p> <p>You can either specify the names of the radio options or you can specify a query so that the names are selected from the database (or an external table) and presented dynamically. This input type allows the user to select only one option.</p> <p>Corresponds to the HTML input type <code>RADIO</code>.</p>
EWEBEDITPRO	<p>A field whose contents you edit by using the eWebEditPro HTML editor, a third-party tool from Ektron, Inc.</p> <p>When you specify that a field is an eWebEditPro field, it's best if you make it a URL field. That is, set a string for <code>PROPERTY NAME</code> that begins with the letters "url" and set <code>STORAGE TYPE</code> (the property's data type) to <code>VARCHAR</code>.</p>
ELEMENT	<p>Calls an element that you create to display a field on the <b>ContentForm</b>, <b>ContentDetails</b>, or <b>SearchForm</b> forms. The custom element must be found at one of the following locations:</p> <ul style="list-style-type: none"> <li>• For a field on the <b>ContentForm</b> form:  <code>OpenMarket/Xcelerate/AssetType/myAssetType/ContentForm/fieldname</code></li> <li>• For a field on the <b>ContentDetails</b> form:  <code>OpenMarket/Xcelerate/AssetType/myAssetType/ContentDetails/fieldname</code></li> <li>• For a field on the <b>SearchForm</b> form:  <code>OpenMarket/Xcelerate/AssetType/myAssetType/SearchForm/fieldname</code></li> </ul> <p>Where <i>myAssetType</i> is the asset type that you are creating the custom field for, and <i>fieldname</i> is the name of the custom field.</p> <p>An <b>ELEMENT</b> field can have any storage type, including <code>BLOB</code>.</p>

## Datatypes for Standard Asset Fields

You can customise the appearance of CS-Direct's standard asset fields, however, the datatypes of these fields must not be changed.

System fields, which are identified in the following table, can be altered cosmetically, but their behavior cannot change. For other fields, the length of the varchar can be changed, but the datatype must remain the same. The following table lists the datatypes for standard fields:

Field	Datatype
ID(System Field)	NOT NULL NUMBER(38)
NAME	NOT NULL VARCHAR(64)
DESCRIPTION	VARCHAR(128)
TEMPLATE(System Field)	VARCHAR(64)
SUBTYPE	VARCHAR(24)
FILENAME	VARCHAR(64)
PATH	VARCHAR(255)
STATUS(System Field)	NOT NULL VARCHAR(2)
EXTERNALDOCTYPE (System Field)	VARCHAR(64)
URLEXTERNALDOCXML(System Field)	VARCHAR(255)
URLEXTERNALDOC(System Field)	VARCHAR2(255)
CREATEDBY(System Field)	NOT NULL VARCHAR(64)
UPDATEDBY(System Field)	NOT NULL VARCHAR(64)
CREATEDDATE(System Field)	NOT NULL DATE
UPDATEDDATE(System Field)	NOT NULL DATE
STARTDATE	DATE
ENDDATE	DATE

## Elements and SQL Statements for the Asset Type

After you upload an asset descriptor file, you “register” the elements. When you register elements, AssetMaker copies elements in the `AssetStubElementCatalog` table to a directory in the `ElementCatalog` table for this asset type.

Additionally, AssetMaker copies several SQL statements that implement the CS-Direct searches on the **Simple Search** and the **Advanced Search** forms for assets of this type.

If necessary, you can customize the SQL statements, the asset type-specific elements, or, in some cases, the elements in the `AssetStubElementCatalog` table.

**Caution**

**Under no circumstances** should you modify any of the other CS-Direct elements.

For information about customizing your elements, see “Step 6: (Optional) Customize the Asset Type Elements” on page 278.

**The Elements**

AssetMaker places the elements for your new asset type to the `ElementCatalog` table according to the following naming convention:

`OpenMarket/Xcelerate/AssetType/YourNewAssetType`

For example, the elements for the sample asset type “ImageFile” are located here:

`OpenMarket/Xcelerate/AssetType/ImageFile`

The following table lists the elements that AssetMaker copies for each asset type:

Element	Description
ContentForm	Renders the <b>New</b> and <b>Edit</b> forms for assets of this type. When the function is invoked, AssetMaker uses the <code>INPUTFORM</code> statements in the asset descriptor file to format these forms.
ContentDetails	Formats the <b>Inspect</b> form for assets of this type. When the function is invoked, AssetMaker uses the <code>INPUTFORM</code> statements in the asset descriptor file to customize these forms.
SimpleSearch	Renders the <b>Simple Search</b> form for assets of this type. When the function is invoked, AssetMaker uses the <code>SEARCHFORM</code> statements in the asset descriptor file to format these forms.
SearchForm	Formats the <b>Advanced Search</b> form for assets of this type. When the function is invoked, AssetMaker uses the <code>SEARCHFORM</code> statements in the asset descriptor file to format these forms.
AppendSelectDetails	Builds the SQL queries on the individual fields in the <b>Advanced Search</b> form. When the <b>Advanced Search</b> form is rendered, AssetMaker uses the <code>SEARCHFORM</code> statements in the asset descriptor file to customize the form.

Element	Description
AppendSelectDetailsSE	<p>Builds the SQL queries on the individual fields in the <b>Advanced Search</b> form when your system is using a search engine such as Verity or AltaVista.</p> <p>When this function is invoked, AssetMaker uses the SEARCHFORM statements in the asset descriptor file to create the SQL queries.</p>
IndexAdd	<p>The IndexAdd and IndexReplace elements establish which fields (columns) are indexed by the search engine when you are using a search engine. By default, only the standard fields are indexed. If you want other fields indexed, you must customize these forms. For more information, see “Step 6: (Optional) Customize the Asset Type Elements” on page 278.</p>
IndexReplace	See the description of IndexAdd, above.
IndexCreateVerity	<p>If you are using Verity as your search engine, this element interacts with the IndexAdd and IndexReplace elements to establish which fields to index.</p>
Tile	<p>Formats the <b>Search Results</b> page, a page that lists the assets that meet the search criteria, for assets of this type.</p> <p>When the page is rendered, AssetMaker uses the SEARCHRESULTS statements in the asset descriptor file to display the results.</p>
LoadTree	<p>Determines how the assets of this type appear when they are displayed on any tab in the tree <b>other than</b> the <b>Site Plan</b> tab.</p>
LoadSiteTree	<p>Determines how assets of this type appear when they are displayed on the <b>Site Plan</b> tab.</p>
PreUpdate	<p>Is called before a function that writes to the database is completed. In other words, before an asset is saved and during the create, edit, delete, or XMLPost functions, this element is called.</p> <p>This element takes no input from the asset descriptor file. However, you can customize it directly.</p>
PostUpdate	<p>Is called after a function that writes to the database is completed. In other words, after an asset is created, edited, deleted, or imported with XMLPost, this element is called.</p> <p>You can customize this element.</p>

## The SQL Statements

AssetMaker places the SQL statements in the `SystemSQL` table according to the following naming convention:

`OpenMarket/Xcelerate/AssetType/YourNewAssetType`

For example, the elements for the sample asset type “ImageFile” are located here:

`OpenMarket/Xcelerate/ImageFile`

The following table lists the SQL elements that AssetMaker creates:

Statement	Description
SelectSummary	A SQL statement that defines the query used in the <b>Simple Search</b> and <b>Advanced Search</b> form for assets of this type.
SelectSummarySE	Not used.

## Creating Basic Asset Types

The length of time that it takes you to create a new asset type can range widely depending on the complexity of your asset type.

A simple asset type might require you to code one simple asset descriptor file and then upload it. A more complicated asset type might require you to modify the code in the elements that AssetMaker creates for your asset type or to add a database table to hold information that you want displayed in a drop-down list.

### Overview

Following is an overview of the process for creating and configuring a new asset type. This chapter describes each of the steps, except as noted:

1. Code an asset descriptor file.
2. Use AssetMaker forms (accessible from the **Admin** tab in the CSEE user interface) to upload the asset descriptor file, create the database table, and copy the asset type elements from the `AssetStubElementCatalog` table to the appropriate directory in the `ElementCatalog` table.
3. Configure the asset type.
4. Enable the asset type for the site that you are using to develop assets on and create a **Start Menu** shortcut so that you can work with the asset type.
5. Examine the **New**, **Edit**, **Inspect**, **Search**, and **Search Results** forms. If necessary, fine-tune the asset descriptor file, and re-register the asset type elements.
6. (Optional) If necessary, customize the asset type elements.
7. (Optional) Create asset **Association** fields for the new asset type.
8. (Optional) Add **Category** entries for the new asset type.
9. (Optional) Add **Source** entries for the new asset type.
10. (Optional) Add **Subtype** entries for the new asset type.
11. (Optional) Add **Mimetypes** for the new asset type.
12. (Optional) If you are using a search engine (Verity or AltaVista) rather than the CS-Direct database search utility to perform the logic behind the search forms and you want to use it on your new asset type, edit your search elements to enable indexed searching.
13. Code templates for assets of this type. (See Chapter 21, “Coding Elements for Templates and CSElements.”)
14. Move the asset types to the other systems, management and delivery. This allows your administrator to complete the final steps in creating the asset type, including setting up workflow and creating start menu items.



## Before You Begin

Before you begin coding your asset descriptor files, you must plan your design and set up your development system, as described in the following sections.

### Plan the Asset Type Design

Be sure to design your asset types on paper before you start coding an asset descriptor file. Consider the following kinds of details:

- What fields do you need?  
In general, try to minimize the number of fields that you use by organizing the information into useful units. When determining those units, consider both the information you plan to display on your online site and the data-entry needs of the content providers who will enter that data.
- What is the appropriate data type for each field?
- For fields with options, how will you supply the options? With a static list coded in the asset descriptor file or with a lookup table that holds the valid options?
- Which of the CS-Direct features will you use to organize or categorize assets of this type? For example, source, category, and asset associations. For each one, determine their names and plan how it will be used both on the management system and in the design of your online site.
- Does the implementation of your site design require assets of this type to use a different default template based on the publishing target that they are published to? If so, you will need to use the **Subtype** feature. Determine the names of the subtypes that you will need for assets of this type.

### Set Up Your Development System

Also before you begin, be sure to set up your development system. For information about any of these preliminary steps, see the *CSEE Administrator's Guide*:

- Create the appropriate sites.
- Create a user name for yourself that has administrator rights and enable that user name on all of the sites on your development system. (Be sure that the TableEditor ACL is assigned to your user name or you will be unable to create new asset types.)

Note that without administrator rights, you do not have access to the **Admin** tab, which means that you cannot perform any of the procedures in this chapter. For the sake of convenience, assign the **Designer** and **GeneralAdmin** roles to your user name. That way you will have access to all the tabs and all of the existing **Start Menu** shortcuts for the assets in the sample site.

- If you plan to use eWebEditPro, a third-party HTML editor, you must obtain it from FatWire (contact your FatWire sales representative) and configure it on the systems that you plan to use it on. It is not delivered with CS-Direct (or CS-Direct Advantage).

## Step 1: Code the Asset Descriptor File

As described in “Asset Descriptor Files” on page 255, this is the basic format of an asset descriptor file:

```
<?xml version="1.0" ?>
<ASSET NAME="assetName"...>
  <PROPERTIES>
    <PROPERTY.../>
      <STORAGE.../>
      <INPUTFORM.../>
      <SEARCHFORM.../>
      <SEARCHRESULTS.../>
    </PROPERTY>
    <PROPERTY... />
      <STORAGE.../>
      <INPUTFORM.../>
      <SEARCHFORM.../>
      <SEARCHRESULTS.../>
    </PROPERTY>
  </PROPERTIES>
</ASSET>
```

To code your asset descriptor files, read the “AssetMaker Tags” chapter in the *CSEE Developer's Tag Reference* and use the tags described in that chapter to code the file. You can use the native XML editor in Content Server Explorer to code the file or you can use any other XML editor.

Note that you can customize any of the standard asset fields by including them in your asset descriptor file. You may not change the storage type of a standard asset field. For a list of these storage types, see “Datatypes for Standard Asset Fields” on page 260.

This section offers a sample asset descriptor file and several examples about coding specific kinds of properties.

### Sample Asset Descriptor File: ImageFile.xml

If the Burlington Financial sample site is installed on your system, you will find the ImageFile.xml asset descriptor file in the AssetType table. You can either start Content Server Explorer and open the file or you can examine it here:

```
<!-- this is the description of an asset -->
<ASSET NAME="ImageFile" DESCRIPTION="ImageFile" MARKERIMAGE="/
Xcelerate/data/help16.gif" PROCESSOR="4.0"
DEFDIR="c:\FutureTense\Storage\ImageFile">
  <PROPERTIES>

    <PROPERTY NAME="source" DESCRIPTION="Source">
      <STORAGE TYPE="VARCHAR" LENGTH="24" />
      <INPUTFORM DESCRIPTION="Source" TYPE="SELECT"
TABLENAME="Source" OPTIONDESCKEY="description"
OPTIONVALUEKEY="source" SOURCETYPE="TABLE" />
      <SEARCHFORM DESCRIPTION="Source" TYPE="SELECT"
TABLENAME="Source" OPTIONDESCKEY="description"
OPTIONVALUEKEY="source" SOURCETYPE="TABLE" />
    </PROPERTY>
```

```

        <PROPERTY NAME="urlpicture" DESCRIPTION="Image File">
            <STORAGE TYPE="VARCHAR" LENGTH="255" />
            <INPUTFORM TYPE="UPLOAD" WIDTH="36" REQUIRED="NO"
LINKTEXT="Image" />
        </PROPERTY>

        <PROPERTY NAME="urlthumbnail" DESCRIPTION="Thumbnail
File">
            <STORAGE TYPE="VARCHAR" LENGTH="255" />
            <INPUTFORM TYPE="UPLOAD" WIDTH="36" REQUIRED="NO"
LINKTEXT="Image" />
        </PROPERTY>

        <PROPERTY NAME="mimetype" DESCRIPTION="Mimetype">
            <STORAGE TYPE="VARCHAR" LENGTH="36" />
            <INPUTFORM TYPE="SELECT" SOURCETYPE="TABLE"
TABLENAME="MimeType" OPTIONDESCKEY="description"
OPTIONVALUEKEY="mimetype"
SQL="SELECT mimetype, description FROM MimeType WHERE
keyword = 'image' AND isdefault = 'y'" INSTRUCTION="Add more
options to mimetype table with isdefault=y and keyword=image"/>
            <SEARCHFORM DESCRIPTION="MimeType" TYPE="SELECT"
SOURCETYPE="TABLE" TABLENAME="MimeType"
OPTIONDESCKEY="description" OPTIONVALUEKEY="mimetype"
SQL="SELECT mimetype, description FROM MimeType WHERE
keyword = 'image' AND isdefault = 'y'"/>
        </PROPERTY>

        <PROPERTY NAME="width" DESCRIPTION="Width">
            <STORAGE TYPE="INTEGER" LENGTH="4" />
            <INPUTFORM TYPE="TEXT" WIDTH="4" MAXLENGTH="4"
REQUIRED="NO" DEFAULT="" />
            <SEARCHFORM DESCRIPTION="Width is" TYPE="TEXT"
WIDTH="4" MAXLENGTH="4" VERB="" />
        </PROPERTY>

        <PROPERTY NAME="height" DESCRIPTION="Height">
            <STORAGE TYPE="INTEGER" LENGTH="4" />
            <INPUTFORM TYPE="TEXT" WIDTH="4" MAXLENGTH="4"
REQUIRED="NO" DEFAULT="" />
            <SEARCHFORM DESCRIPTION="Height is" TYPE="TEXT"
WIDTH="4" MAXLENGTH="4" VERB="" />
        </PROPERTY>

        <PROPERTY NAME="align" DESCRIPTION="Alignment">
            <STORAGE TYPE="VARCHAR" LENGTH="8" />
            <INPUTFORM TYPE="SELECT" SOURCETYPE="STRING"
OPTIONVALUES="Left,Center,Right"
OPTIONDESCRIPTIONS="Left,Center,Right" />

```

```

        <SEARCHFORM DESCRIPTION="Alignment" TYPE="SELECT"
SOURCE TYPE="STRING" OPTIONVALUES="Left,Center,Right"
OPTIONDESCRIPTIONS="Left,Center,Right" />
    </PROPERTY>

    <PROPERTY NAME="artist" DESCRIPTION="Artist">
        <STORAGE TYPE="VARCHAR" LENGTH="64" />
        <INPUTFORM TYPE="TEXT" WIDTH="36" MAXLENGTH="36"
REQUIRED="NO" DEFAULT="" />
        <SEARCHFORM DESCRIPTION="Artist contains" TYPE="TEXT"
WIDTH="36" MAXLENGTH="64" />
    </PROPERTY>

    <PROPERTY NAME="alttext" DESCRIPTION="Alt Text">
        <STORAGE TYPE="VARCHAR" LENGTH="255" />
        <INPUTFORM TYPE="TEXT" WIDTH="48" MAXLENGTH="255"
REQUIRED="NO" DEFAULT="" />
        <SEARCHFORM DESCRIPTION="Alt Text contains"
TYPE="TEXT" WIDTH="48" MAXLENGTH="255" />
    </PROPERTY>

    <PROPERTY NAME="keywords" DESCRIPTION="Keywords">
        <STORAGE TYPE="VARCHAR" LENGTH="128" />
        <INPUTFORM TYPE="TEXT" WIDTH="48" MAXLENGTH="128"
REQUIRED="NO" DEFAULT="" />
        <SEARCHFORM DESCRIPTION="Keywords contain" TYPE="TEXT"
WIDTH="48" MAXLENGTH="128" />
    </PROPERTY>

    <PROPERTY NAME="imagedate" DESCRIPTION="Image date">
        <STORAGE TYPE="TIMESTAMP" LENGTH="8" />
        <INPUTFORM TYPE="ELEMENT" WIDTH="24" MAXLENGTH="48"
REQUIRED="NO" DEFAULT="" INSTRUCTION="Format: yyyy-mm-dd hh:mm" />
        <SEARCHFORM DESCRIPTION="Image date"
TYPE="ELEMENT" WIDTH="48" MAXLENGTH="128" />
    </PROPERTY>

</PROPERTIES>
</ASSET>

```

Examine this asset descriptor file and then, if Burlington Financial is installed on your system, start CS-Direct, select the Burlington Financial site, examine the CS-Direct forms for the imagefile asset type, and compare the forms to the asset descriptor file.

Note the following about the ImageFile asset descriptor file:

- The ASSET tag provides a value for the DEFDIR parameter. All asset tables have at least two URL columns (upload fields) by default, which means you must set a value for the default storage directory (defdir) of any new asset type. (the imagefile asset type has two additional URL columns: urlpicture and urlthumbnail.)

You can set the defdir value either with the ASSET tag's DEFDIR parameter, or with the **defdir** field in the AssetMaker **Create Asset Table** form.

**Note**

A defdir set using the **Create Asset Table** form overrides a defdir set in the asset descriptor file.

For more information about URL columns, see “Indirect Data Storage with the Content Server URL Field” on page 209.

- There are no PROPERTY statements for any of the default columns that AssetMaker creates in an asset type’s database table. (Those columns are listed in “Default Columns in the Basic Asset Type Database Table” on page 173.)
- Not every property that has a SEARCHFORM statement has a matching SEARCHRESULTS statement. In other words, if you decide to put a field on the **Advanced Search** form, it does not mean that you have to display the data from that field on the **Search Results** form.

**Example: Adding the Source Column and Field**

The source column is not created by default even though CS-Direct has a Source feature on the **Admin** tab. In order to use the Source feature on your new asset types, you must include a property statement for the source column and field.

Note the following:

- STORAGE TYPE must be set to “VARCHAR” and LENGTH must be set to “24”.
- INPUTFORM SOURCTYPE must be set to “TABLE” and TABLENAME must be set to “Source”.

For example:

```
<PROPERTY NAME="source" DESCRIPTION="Source">
  <STORAGE TYPE="VARCHAR" LENGTH="24" />
  <INPUTFORM TYPE="SELECT" TABLENAME="Source"
    OPTIONDESCKEY="description" OPTIONVALUEKEY="source"
    SOURCTYPE="TABLE" />
  <SEARCHFORM DESCRIPTION="Source" TYPE="SELECT"
    TABLENAME="Source" OPTIONDESCKEY="description"
    OPTIONVALUEKEY="source" SOURCTYPE="TABLE" />
</PROPERTY>
```

**Example: An Asset Type With Unnamed Associations**

You can create an asset type that supports unnamed associations (multiple asset types associated with the asset) by setting the ASSET tag’s UNNAMEDASSOCIATIONS parameter to YES. This causes a **Contents** field to appear in the asset’s ContentForm, similar to the **Contains** field on the Page asset forms.

The sample code for creating an asset type with unnamed associations follows:

```
<ASSET NAME="Container" DESCRIPTION="Container"
  PLURAL="Containers" UNNAMEDASSOCIATIONS="YES" DEFDIR="C:/
  FutureTense/Storage/Container">
<PROPERTIES>
</PROPERTIES>
</ASSET>
```

## Upload Example 1: A Standard Upload Field

To create an upload field with a **Browse** button, code the `PROPERTY` statement as follows:

1. The string set for `PROPERTY NAME` must begin with the letters `url`.
2. The value for `STORAGE TYPE` must be set to `VARCHAR`.
3. The value for `INPUT TYPE` must be set to `UPLOAD`.

Here is a code snippet of an upload field from the `ImageFile` asset descriptor file:

```
<PROPERTY NAME="urlpicture" DESCRIPTION="Image File">
  <STORAGE TYPE="VARCHAR" LENGTH="255" />
  <INPUTFORM TYPE="UPLOAD" WIDTH="36" REQUIRED="NO"
    LINKTEXT="Image" />
</PROPERTY>
```

### Note

The size of a file that you can select in an upload field is limited to 30 megabytes.

## Upload Example 2: A Text Box Field

To create an upload field with a text box that you can enter the text in (rather than with a **Browse** button that you use to select a file), code the `PROPERTY` statement as follows:

1. The string set for `PROPERTY NAME` must begin with the letters `url`.
2. The value for `STORAGE TYPE` must be set to `VARCHAR`.
3. The value for `INPUT TYPE` must be set to `TEXTAREA`.

The following code snippet creates a text area field for a `url` column:

```
<PROPERTY NAME="urlbody" DESCRIPTION="Article Body">
  <STORAGE TYPE="VARCHAR" LENGTH="256" />
  <INPUTFORM TYPE="TEXTAREA" COLS="48" ROWS="25"
    REQUIRED="YES" />
</PROPERTY>
```

## Upload Example 3: An eWebEdit Pro Field

eWebEditPro is a third-party HTML editor from Ektron, Inc. that the CS-Direct and CS-Direct Advantage products support. You must obtain eWebEditPro from FatWire (contact your FatWire sales representative) to be able to use it—it is not delivered with CS-Direct or CS-Direct Advantage. For information about configuring your system to use eWebEditPro, see the *CSEE Administrator's Guide*.

Code the property statement as follows:

1. The `PROPERTY NAME` should begin with the letters “`url`”. In other words, you should use a URL column for the field. If you do not, you run the risk of making your field too small.
2. The value for `STORAGE TYPE` must be set to `VARCHAR`.

3. `INPUT TYPE` must be set to `EWEBEDITPRO`.

For example:

```
<PROPERTY NAME="urlbody" DESCRIPTION="Body">
  <STORAGE TYPE="VARCHAR" LENGTH="500"/>
  <INPUTFORM TYPE="EWEBEDITPRO" WIDTH="300" HEIGHT="300"
    REQUIRED="YES" INSTRUCTION="Be concise! No more than 3
    paragraphs."/>
</PROPERTY>
```

## Upload Example 4: A Text Field With Embedded Links

You can allow content editors to embed hyperlinks within a text field. If embedded links are enabled for a text field, two embedded link buttons—**Add Link** and **Include**—appear next to the field. To enable embedded links for a text field, code the property statement as follows:

1. The string set for `PROPERTY NAME` must begin with the letters `url`.
2. The value for `STORAGE TYPE` must be set to `VARCHAR`.
3. The value for `INPUT TYPE` must be set to `TEXTAREA`.

The following code snippet creates a text area field for a `url` column:

```
<PROPERTY NAME="urltext" DESCRIPTION="Text">
  <STORAGE TYPE="VARCHAR" LENGTH="2000"/>
  <INPUTFORM TYPE="TEXTAREA" COLS="48" ROWS="25"
    EMBEDDEDLINKS="YES" REQUIRED="YES"/>
</PROPERTY>
```

## Upload Example 4: A Field That Uploads a Binary File

The following code creates a field where you can upload a blob. Note that if you do not specify the `MIMETYPE`, you may not be able to view the blob from the **Edit** and **Inspect** forms.

```
<PROPERTY NAME="type_binary" DESCRIPTION="Binary">
  <STORAGE TYPE="BINARY"/>
  <INPUTFORM TYPE="UPLOAD" WIDTH="24" MAXLENGTH="64"
    MIMETYPE="application/msword" LINKTEXT="Edit with Microsoft Word"
    INSTRUCTION="maps to cc.blob"/>
</PROPERTY>
```

## Example: Enabling path, filename, startdate, and enddate

The `path`, `filename`, `startdate`, and `enddate` columns are special cases.

AssetMaker creates columns for `path`, `filename`, `startdate`, and `enddate` without requiring a `PROPERTY` statement for them. However, while these columns exist, their fields do not appear on your asset forms unless you include a `PROPERTY` statement for them in the asset descriptor file.

Note the following about these columns:

- For **path**, `STORAGE TYPE` must be set to `VARCHAR` and `LENGTH` must be set to 255.
- For **filename**, `STORAGE TYPE` must be set to `VARCHAR` and `LENGTH` must be set to 128.

- For **startdate**, STORAGE TYPE must be set to TIMESTAMP.
- For **enddate**, STORAGE TYPE must be set to TIMESTAMP.

### Note

If you include one of these standard columns in your asset descriptor file but your storage type does not match the one specified in this list, AssetMaker cannot create the asset type.

For example:

```
<PROPERTY NAME="path" DESCRIPTION="Path">
  <STORAGE TYPE="VARCHAR" LENGTH="255" />
  <INPUTFORM DESCRIPTION="Path" TYPE="TEXT" LENGTH="255" />
</PROPERTY>
```

## Example: Using a Query to Obtain Options for a Drop-Down List

When the INPUTFORM TYPE of your property is SELECT, you can have CS-Direct populate the drop-down list for the select field with a static list of items that you provide with the OPTIONDESCRIPTIONS parameter, or with a list of items that CS-Direct obtains, dynamically, from a database table.

Another example of a select field that populates its drop-down list dynamically from a table is the Mimetype field on the imagefile forms, which queries the MimeType table for its options. Here's the code:

```
<PROPERTY NAME="mimetype" DESCRIPTION="Mimetype">

  <STORAGE TYPE="VARCHAR" LENGTH="36" />

  <INPUTFORM TYPE="SELECT" SOURCETYPE="TABLE"
    TABLENAME="mimetype" OPTIONDESCKEY="description"
    OPTIONVALUEKEY="mimetype" SQL="SELECT mimetype, description
    FROM mimetype WHERE keyword = 'image' AND
    isdefault = 'y'" INSTRUCTION="Add more options to mimetype
    table with isdefault=y and keyword=image"/>

  <SEARCHFORM DESCRIPTION="Mimetype" TYPE="SELECT"
    SOURCETYPE="TABLE" TABLENAME="mimetype"
    OPTIONDESCKEY="description" OPTIONVALUEKEY="mimetype"
    SQL="SELECT mimetype, description FROM mimetype WHERE keyword =
    'image' AND isdefault = 'y'"/>

</PROPERTY>
```

This example shows a field that not only selects items from a database table, but, through an additional SQL query, further restricts which items are returned from that table, as well.



## Example: Using a Query to Obtain Labels for Radio Buttons

If the `INPUTFORM` TYPE of your property is `RADIO`, you can input the label for each radio button using a static list of items that you provide with the `OPTIONDESCRIPTIONS` parameter, or with a list of items that CS-Direct obtains, dynamically, from a database table.

The following sample code creates radio buttons with labels drawn from the `CreditCard` table:

```
<PROPERTY NAME="sqlrbcc" DESCRIPTION="SQL RB Credit Card">
    <STORAGE TYPE="VARCHAR" LENGTH="4" />
    <INPUTFORM TYPE="RADIO" SOURCETYPE="TABLE"
TABLENAME="CreditCard" RBVALUEKEY="ccvalue"
RBDESCKEY="ccdescription" />
    <SEARCHFORM TYPE="SELECT" DESCRIPTION="Credit Card:"
SOURCETYPE="TABLE" TABLENAME="CreditCard" OPTIONVALUEKEY="ccvalue"
OPTIONDESCKEY="ccdescription" SQL="SELECT ccvalue,ccdescription
FROM CreditCard ORDER BY ccdescription"/>
</PROPERTY>
```

## Example: Creating a Field with the ELEMENT Input Type

You can modify the fields on your asset forms by using the `ELEMENT` input type to call custom code to display the fields as you want them. You can use this method to create new asset fields, or to change the appearance of standard asset fields—though you cannot modify the storage type of a standard asset field.

An `ELEMENT` field can have any storage type, including `BLOB`.

When you set a field's input type to `ELEMENT`, Content Server calls a custom element to display the field. The custom element must be found at one of the following locations:

- For a field on the **ContentForm** form:  
OpenMarket/Xcelerate/AssetType/*myAssetType*/ContentForm/*fieldname*
- For a field on the **ContentDetails** form:  
OpenMarket/Xcelerate/AssetType/*myAssetType*/ContentDetails/*fieldname*
- For a field on the **SearchForm** form:  
OpenMarket/Xcelerate/AssetType/*myAssetType*/SearchForm/*fieldname*

Note that *myAssetType* is the asset type that you are creating the custom field for, and *fieldname* is the name of the custom field.

The following excerpt from an asset descriptor file uses the `ELEMENT` input type:

```
<PROPERTY NAME="imagedate" DESCRIPTION="Image date">
    <STORAGE TYPE="TIMESTAMP" LENGTH="8" />
    <INPUTFORM TYPE="ELEMENT" WIDTH="24" MAXLENGTH="48"
REQUIRED="NO" DEFAULT="" INSTRUCTION="Format: yyyy-mm-dd hh:mm"/>
    <SEARCHFORM DESCRIPTION="Image date" TYPE="ELEMENT"
WIDTH="48" MAXLENGTH="128" />
</PROPERTY>
```

Note that the input form uses a customized field, but the search form and content details forms display default fields.

The following code excerpt is the element that the descriptor file calls:

```
<!-- OpenMarket/Xcelerate/AssetType/ImageFile/ContentForm/
imagedate
-
- INPUT
-   Variables.AssetType
   Variables.fieldname
   Variables.fieldvalue- default or value for this field
   Variables.datatype - from STORAGE tag in ADF for this field
   Variables.helpimage - help icon
   Variables.alttext - help text from INPUT tag in ADF
   Other fields from input tag are in:
       Variables.assetmaker/property/Variables.fieldname/
inputform/[tag attribute]
-   field name used in form should be
Variables.AssetType:Variables.fieldname

- OUTPUT
-
-->
    Enter date in the format yyyy-mm-dd hh:mm:ss<br/>

    <setvar NAME="inputfieldsize" VALUE="Variables.assetmaker/
property/Variables.fieldname/inputform/width"/>

    <callelement NAME="OpenMarket/Xcelerate/Scripts/FormatDate"/>
    <INPUT TYPE="text" SIZE="Variables.inputfieldsize"
NAME="Variables.AssetType:Variables.fieldname"
VALUE="Variables.fieldvalue"
REPLACEALL="Variables.inputfieldsize,Variables.fieldvalue,
Variables.fieldname,Variables.AssetType"

onChange="padDate(this.form.elements['Variables.AssetType:Variable
s.fieldname'].value,this,'Variables.AssetType:Variables.fieldname'
);"/>

</FTCS>
```

Note that you can customize as many fields as you want using the ELEMENT input type, but that you must write a separate element for each field that you want to modify.

## Step 2: Upload the Asset Descriptor File

After you have coded the asset descriptor file for your asset type, use AssetMaker to upload it and register the new elements:

1. Open your browser and enter this address:  
`http://your_server/Xcelerate/LoginPage.html`
2. Enter your login name and password and click **Login**. Note that you must have administrator rights associated with your user name (login name) in order to have access to AssetMaker.

3. Select the **Admin tab > AssetMaker > Add New**.

The **Add New Asset Type** form appears:

#### Add New Asset Type

Name:  (required)

Descriptor File:   (required)

4. Click in the **Name** field and enter the name of the new asset type. The string that you enter into this field must exactly match the string specified by the `ASSET NAME` parameter in the asset descriptor file that you are going to upload.
5. Click the **Browse** button next to the **Descriptor File** field and select the asset descriptor file.
6. Click **Save**.

AssetMaker enters the file into the `AssetType` table (that is, it uploads the asset descriptor file to the default storage directory for the `AssetType` table), and then displays the **Asset Type** form:

#### Asset Type: HelloArticle

<input type="button" value="Inspect"/> <input type="button" value="Edit"/> <input type="button" value="Delete"/> <input type="button" value="more..."/>	
<b>Name:</b>	test1
<b>Description:</b>	HelloArticle
<b>Plural Form:</b>	test1s
<b>Can Be a Child Asset:</b>	True
<b>Revision Tracking:</b>	Not Tracked <a href="#">» Manage Revision Tracking</a>
<b>Class:</b>	com.openmarket.assetmaker.asset.AMAsset <a href="#">» View Descriptor File</a> <input type="button" value="Register Asset Elements..."/>
<b>DefDir:</b>	<input type="button" value="Create Asset Table..."/>
<b>ID:</b>	1036530317861

[» List all Asset Types](#)

7. Select **Create Asset Table**.
8. Examine the value in the **Defdir** field and change it if necessary. AssetMaker reads this value from the asset descriptor file. You must enter a value in this field if either of the following conditions exist:
  - If you did not provide a value with the `DEFDIR` parameter for the `ASSET` tag in the asset descriptor.
  - If you want to change the default storage directory, which is typical when you are migrating the asset type to another system.
9. Click **Submit**.

AssetMaker creates the table.

10. Select **Register Asset Elements** and then click the **Register Asset Elements** button.

AssetMaker copies the elements from the AssetStubElementCatalog table to the asset type's directory in the ElementCatalog table and copies the SQL statements in the SystemSQL table. When it is finished, it displays a summary like this one:

Updated ElementCatalog.

```
Created element: OpenMarket/Xcelerate/AssetType/test1/AppendSelectDetails
Created element: OpenMarket/Xcelerate/AssetType/test1/AppendSelectDetailsSE
Created element: OpenMarket/Xcelerate/AssetType/test1/ContentDetails
Created element: OpenMarket/Xcelerate/AssetType/test1/ContentForm
Created element: OpenMarket/Xcelerate/AssetType/test1/IndexAdd
Created element: OpenMarket/Xcelerate/AssetType/test1/IndexCreateVerity
Created element: OpenMarket/Xcelerate/AssetType/test1/IndexReplace
Created element: OpenMarket/Xcelerate/AssetType/test1/PostUpdate
Created element: OpenMarket/Xcelerate/AssetType/test1/PreUpdate
Created element: OpenMarket/Xcelerate/AssetType/test1/SearchForm
Created element: OpenMarket/Xcelerate/AssetType/test1/SimpleSearch
Created element: OpenMarket/Xcelerate/AssetType/test1/Tile
Created element: OpenMarket/Xcelerate/AssetType/test1/LoadTree
Created element: OpenMarket/Xcelerate/AssetType/test1/LoadSiteTree
```

Updated SystemSQL.

Created query: OpenMarket/Xcelerate/AssetType/test1/SelectSummary

**Asset Type: HelloArticle**

<span>Inspect</span> <span>Edit</span> <span>Delete</span> <span>more...</span>	
<b>Name:</b>	test1
<b>Description:</b>	HelloArticle

### Step 3: Configure the Asset Type

When AssetMaker created the new asset type (in step 2), it also created an icon and administrative forms for configuring the new asset type, located on the **Admin** tab.

Complete the following configuration steps:

1. On the **Admin** tab, expand the **Asset Types** icon.
2. Under **Asset Types**, select your new asset type. (If you do not see it in the list, click the right mouse button, select **Refresh** from the pop-up menu, and then select your new asset type.)

3. Click **Edit**.

The following form appears:

**Edit Asset Type**

<b>Name:</b>	test1
<b>*Description:</b>	<input type="text" value="HelloArticle"/>
<b>*Plural Form:</b>	<input type="text" value="test1s"/>
<b>Can Be a Child Asset:</b>	<input checked="" type="radio"/> True <input type="radio"/> False <small>Indicates whether this asset is allowed to be a child of other asset types.</small>
<b>Class:</b>	com.openmarket.assetmaker.asset.AMAsset
<b>ID:</b>	1036530317861

4. (Optional) Click in the **Description** field and change it, if necessary. The text in this field is the name that CS-Direct uses for this asset type on the forms and lists in the Content Server interface. By default, **Description** is set to the value of the `ASSET DESCRIPTION` statement in the asset descriptor file.
5. (Optional) Click in the **Plural Form** field and change it, if necessary. The text in this field is the text that CS-Direct uses in the Content Server interface when it is appropriate to refer to the asset type in the plural. By default, **Plural Form** is set to the value of the `ASSET DESCRIPTION` statement in the asset descriptor file plus the letter “s.” You can also specify your own plural form in the asset descriptor file by setting the value of the `ASSET` tag’s `PLURAL` parameter.
6. (Optional) Click in the **Can Be Child Asset** field and change the value, if necessary. By default, this field is set to **True**, which means that this asset type can be the child asset type in an association field for another asset type. Its name appears in the list of asset types in the **Child Asset Field** on the **Add New Association** forms.
7. Click **Save**.

## Step 4: Enable the Asset Type on Your Site

Before you can examine the forms that the new elements render for the asset type, you must enable the asset on the site (or sites) that you are working with and create a simple **Start Menu** shortcut for it.

For instructions on how to enable your asset types and create Start Menu shortcuts for them, see the *CSEE Administrator’s Guide*.

## Step 5: Fine-Tune the Asset Descriptor File

Create a new asset of your new type and examine the **New**, **Edit**, **Inspect**, and **Search** forms. (To create a new asset of this type, click **New** on the toolbar and select the **Start Menu** shortcut that you created in the preceding procedure. For step-by-step procedures that describe how to create and work with assets, see the *CSEE User's Guide*.)

After you examine the forms, you might need to modify the asset descriptor file.

You can make any of the following changes with relatively few steps:

- Re-ordering the fields that appear on the CS-Direct forms for the asset type
- Changing the name of a field (that is, the value of `PROPERTY DESCRIPTION`)
- Changing anything in an `INPUTFORM`, `SEARCHFORM`, or `SEARCHRESULTS` statement

If you want to make any of the changes in the preceding list, complete the following steps:

1. Use Content Server Explorer to open and modify the asset descriptor file that you uploaded in “Step 2: Upload the Asset Descriptor File” on page 274.
2. Save your changes.
3. Re-register the elements for the asset type.

You cannot change the schema of the asset type's database table after it is created. The following changes are schema changes:

- Changing the name of a column (the `NAME` parameter in an existing `PROPERTY` statement)
- Changing the data type of the column (the `STORAGE TYPE` or `LENGTH` in an existing `PROPERTY` statement)
- Adding a new property (new `PROPERTY` statement), which adds a new column to the table
- Deleting a property (an existing `PROPERTY` statement), which deletes a column from the table

Therefore, if you want to make any of the changes in the preceding list, you must first delete the asset type, modify the asset descriptor file, and then create the asset type again.

Note that if you have customized the elements that AssetMaker copied from the `AssetStubElementCatalog` table to the asset type's directory in the `ElementCatalog` table, your changes are overwritten when you re-register the elements.

## Step 6: (Optional) Customize the Asset Type Elements

There are two ways to customize your asset type elements:

- If your management system requires the same modifications for assets of all types, modify the source elements in the `AssetStubElementCatalog` table before you create your asset types. That way you only have to make your customizations once.
- If your change is specific to a certain asset type, modify the elements in that asset type's directory in the `ElementCatalog` table.

If you change the source elements (stub), you must re-register all of the asset types that you want to take the new changes.

Note that, although customizing elements might be necessary, it is not supported. If you need to customize any element, consider the following issues:

- When you re-register asset elements, AssetMaker moves new copies of the elements from the `AssetStubElementCatalog` table to the asset type's directory in the `ElementCatalog` table. If you made any code changes to the elements in the asset type directory, they are overwritten when AssetMaker moves the new copies.
- The upgrade from one version of CS-Direct to another typically installs new source elements in the `AssetStubElementCatalog` table. That means that any code changes in the stub elements are overwritten when you re-register your asset types after you upgrade.

Be scrupulous about tracking all of your customizations at all times. That way you can re-create your work if you need to.

## About PreUpdate and PostUpdate

The actions or procedures that can be performed on any asset type are called **functions**. For example, to create, edit, copy, delete, and so on are all functions.

The `PreUpdate` and `PostUpdate` elements contain logic that is invoked before and after writing information about an asset to the database. The `PreUpdate` and `PostUpdate` elements uses a variable named `updatetype`, to determine the kind of function that is underway. If necessary, you can customize these elements, using the value of `updatetype` as a condition for additional logic.

The functions that invoke the `PreUpdate` and `PostUpdate` elements are as follows:

- new
- edit
- delete
- XMLPost

Both the new function and the edit function call the `PreUpdate` element twice:

- Before the function renders the **New** or **Edit** form
- Before it saves an asset

The following table defines the values of the `updatetype` variable:

updatetype value	Description
setformdefaults	For <code>PreUpdate</code> only: the new function is about to render the <b>New</b> form. (Note that <code>updatetype</code> is never set to <code>setformdefaults</code> in the <code>PostUpdate</code> element.)
create	For <code>PreUpdate</code> : the new function is about to save a new asset. For <code>PostUpdate</code> : the new function saved a new asset.
editfront	For <code>PreUpdate</code> only: the edit function is about to render the <b>Edit</b> form. (Note that <code>updatetype</code> is never set to <code>editfront</code> in the <code>PostUpdate</code> element.)

updatetype value	Description
edit	For PreUpdate: the edit function is about to save the edited asset. For PostUpdate: the edit function just saved an edited asset.
delete	For PreUpdate: the delete function is about to delete an asset. For PostUpdate: the delete function just deleted an asset.
remotepost	For PreUpdate: the XMLPost function is about to import an asset. For PostUpdate: the XMLPost function just imported an edited asset.
MSWord	For PreUpdate: CS-Desktop is about to save an asset created or edited in Microsoft Word.

There are several reasons why you might need to modify the PreUpdate or PostUpdate elements. For example, perhaps your system is set up to import batches of articles from a wire service. You can modify the PreUpdate element to set the value for **Source** to “wirefeed” and the value for a **Byline** field to “API” when updatetype=remotepost.

## Step 7: (Optional) Configure Subtypes

For the basic asset types that you design with AssetMaker, subtype means a subclass of the asset type based on how that asset is rendered. You can use subtypes to define a separate default approval template for an asset of that type and subtype on each publishing target.

### Adding Subtypes

To create a subtype, complete the following steps:

1. On the **Admin** tab, expand the **Asset Types** option.
2. Under the **Asset Types** option, select the asset type that you want to create subtypes for.
3. Select the **Subtypes** option.

The Subtypes form appears:

Subtypes for Asset Type: » HelloArticle

Name	Sites

Add New Subtype


4. Click **Add New Subtype**.
5. In the next form, click in the first field in the **Name** column and enter the name of the subtype.
6. In the corresponding field in the **Sites** column, select the names of the sites that need this subtype.



7. Repeat steps 5 and 6 for up to five subtypes.
8. Click **Save**.

## Deleting Subtypes

To delete a subtype, complete the following steps:

1. On the **Admin** tab, expand the **Asset Types** option.
2. Under the **Asset Types** option, select the asset type that you want to create subtypes for.
3. Select the **Subtypes** option.
4. In the **Subtypes** form, click the  icon.
5. Click **Delete Subtype**.

## Step 8: (Optional) Configure Association Fields

Named associations are described in “The Basic Asset Model” on page 168. Briefly, named associations are defined, asset-type-specific relationships that describe parent-child relationships or links between individual assets or asset sub-types. When you code your template elements, you use the names of these relationships to identify individual assets or sub-types, without having to refer to the object by its name.

For example, the Burlington Financial sample site associates imagefile assets with article assets. The template elements are coded to extract an associated imagefile asset by the name of the association rather than the name of the asset. That way, if you choose a different imagefile for an article, the template displays the new imagefile without your having to recode the template.

Named associations are represented as fields in the asset forms. These fields are not created from an asset descriptor file. Instead, you use the **Asset Associations** forms on the **Admin** tab.

Examples of association fields from the Burlington Financial sample site include the **Main Image** and **Teaser Image** associations between article assets and imagefile assets. When you create a Burlington Financial article asset, you can select an image asset from the **Main Image** and **Teaser Image** fields.

## Adding Association Fields

To add an association field, complete the following steps:

1. On the **Admin** tab, select **Asset Types**.
2. Under the **Asset Types** option, select the asset type that you want to create associations for.

- Under the asset type you selected, select **Asset Associations > Add New**.

The **Add New Association** form appears:

Add New Association

<b>Asset Type:</b>	HelloArticle
<b>*Name:</b>	<input type="text"/> (Name cannot contain spaces or punctuation.)
<b>*Description:</b>	<input type="text"/>
<b>Child Asset:</b>	Article
<b>HelloArticle Subtypes:</b>	test
<b>Mirror Dependency Type:</b>	<input checked="" type="radio"/> Exists - Any approved version of the associated asset is acceptable for publish of HelloArticle. <input type="radio"/> Exact version - Any change to the associated asset will require approval for publish of HelloArticle.

- Click in the **Name** field and enter the name of the association field, without using spaces, decimal points, or punctuation marks.
- Click in the **Description** field and enter a short description of the field. Keep the description short because CS-Direct uses the text entered into this field as the name of the field when it is displayed on the new asset form.
- Click in the **Child Asset** field and select the kind of asset type that will appear in this field. (It is called the **Child Asset** field because associations create parent-child relationships between assets.) You cannot specify the template or the page asset type in this field.
- Select the subtype or subtypes for this association by highlighting them in the **Subtypes** field. To select multiple subtypes, press the **Control** key while you click your selection with the mouse.
- Select the appropriate **Dependency Type** for this asset association. By default, it is set to **Exists**. (The dependency type specified here is used by the approval system when your publishing method is Mirror to Server. For information about dependency types, see “About Coding to Log Dependencies” on page 475).
- Click **Add**.

CS-Direct creates a row in the `Association` table for this association. The name used in the row is the text you entered in the **Name** field in step 6.

## Deleting Association Fields

Before you delete an association field, be sure to search for any assets that use it and clear the value in the field. Otherwise, those assets will still have the association when you delete the association field, but, because the field is no longer displayed in the Content Server interface, you will be unable to change it.

To delete an association field, complete the following steps:

- On the **Admin** tab, select **Asset Types**.

2. Under the **Asset Types** option, select the asset type whose association field you want to delete.
3. Under the asset type you selected, select the association that you want to delete.
4. In the form on the right, click **Delete**.

The association field is now no longer displayed on forms for this asset type.

## Step 9: (Optional) Configure Categories

You can use categories to organize your asset types according to some convention that works for your site design. For example, the Burlington Financial sample site uses queries based on category to determine which articles should be selected for various sections of the online site.

Although all basic asset types have a **Category** field (column) by default, it is not a required field and you do not have to use it.

### Adding Categories

To add a category, complete the following steps:

1. On the **Admin** tab, select **Asset Types**.
2. Under the **Asset Types** option, select the asset type that you want to create categories for. (For example, select **Article**.)
3. Under that asset type, select **Categories > Add New**.

The following form appears:

#### Add New Category

Asset Type:	SimpleAsset
*Description:	<input type="text"/>
*Category Code:	<input type="text"/>
<input type="button" value="Add"/>	

4. Click in the **Description** field and enter a short description of the category. Keep the description short because CS-Direct uses the text that you enter in this field in the site tree and in the drop-down list for the **Category** field on the forms for assets of this type.
5. In the **Category Code** field, enter a two-character code for your new category.
6. Click the **Add** button.
7. Repeat steps 4 through 8, as needed, to finish creating the categories for this asset type.

The categories you created now appear in the drop-down lists in the **Category** fields on the **New** and **Edit** asset forms.

## Deleting Categories

To delete a category, complete the following steps:

1. On the **Admin** tab, select **Asset Types**.
2. Under the **Asset Types** option, select the asset type that you want to delete a category for.
3. Under that asset type, select the category that you want to delete.
4. Click **Delete**.

## Step 10: (Optional) Configure Sources

Sources apply to all the asset types in all the sites on your system. Therefore, if you are using Source, you need to add your sources only once (not for each asset type).

### Adding Sources

To create a source, complete the following steps:

1. On the **Admin** tab, select **Sources > Add New**.

The **Add Source** form appears:

---

**Add Source**

\*Source:

\*Description:

2. Click in the **Source** field and enter the name of a source.
3. Click in the **Description** field and enter a short description of the source. Keep this description short because CS-Direct uses the text from this field in the drop-down list for the **Source** field on the forms for assets.
4. Click **Add**.

The source is written to the `Source` table.

5. Repeat steps 1 through 4 for each source that you need for your asset types.

### Deleting Sources

To delete a source, complete the following steps:

1. On the **Admin** form, select **Sources**.
2. Under the **Sources** option, select the name of the source that you want to delete.
3. In the form for this source, click **Delete**.

## Step 11: (Optional) Add Mimetypes

The `MimeType` table holds mimetype codes that can be displayed in mimetype fields. You must add mimetypes for your asset if you reference the `MimeType` table in your asset descriptor file.

For example, both the imagefile and stylesheet asset types have upload fields with **Browse** buttons next to them. After you select a file in the upload field, you specify the mimetype of the file you selected from the **Mimetype** field.

The **Mimetype** fields for the imagefile and stylesheet asset types query the `MimeType` table for mimetype codes based on the keyword column:

- Mimetype codes with their keyword set to `stylesheet` appear in the drop-down list of the **Mimetype** field in the **Stylesheet** form.
- Mimetype codes with their keyword set to `image` appear in the drop-down list of the **Mimetype** field in the **ImageFile** form.

By default, stylesheet files can be CSS files and imagefile files can be GIF or JPEG files. You can add mimetype codes for these asset types, for your own custom asset types, or for any other reason.

To add mime types to a **Mimetype** drop-down list, complete the following steps:

1. Open Content Server Explorer.
2. Expand the **MimeType** table.
3. Do one of the following:
  - If you are adding a mimetype for the imagefile asset type, select the **image** folder in the **MimeType** table.
  - If you are adding a mimetype for the stylesheet asset type, select the **text** folder in the **MimeType** table
  - If you are adding a mimetype for a custom asset type with an upload field or for any other reason, select the appropriate location in the **MimeType** table.
4. Right-click in the frame on the right and then select **New** from the drop-down list.  
Content Server Explorer creates a new row in the table.
5. In the **mimetype** field, enter the name of the mimetype. For example: `XSL`.
6. In the **extension** field, enter the extension for mime types of this type. For example: `.xml`.
7. In the **description** field, enter a short description of this mimetype.
8. In the **isdefault** field, do one of the following:
  - If you want to specify more than one extension for the same mimetype, enter `n`. For example, if a mimetype named `JPG` has `.jpg` and `.jpeg` extensions, set **isdefault** to `n`.
  - If this is the only extension for the mimetype, enter `y`.

9. Click in the **keyword** field and do one of the following:
  - If you are adding a mimetype for the imagefile asset type, enter `image`.
  - If you are adding a mimetype for the stylesheet asset type, enter `stylesheet`.
  - If you are adding a mimetype for a custom asset type with an upload field or for any other reason, enter the appropriate keyword.
10. Select **File > Save all**.

Content Server Explorer saves the row.

If you added a mimetype code with the keyword of `image`, that mimetype is now displayed in the **Mimetype** field of the **ImageFile** form. If you added a mimetype code with the keyword of `stylesheet`, that mimetype is now displayed in the **Mimetype** field of the **Stylesheet** form.

## Step 12: (Optional) Edit Search Elements to Enable Indexed Search

CS-Direct (and CS-Direct Advantage and CS-Engage) has its own database SQL search mechanism that runs the Simple and Advanced searches. However, you can set up your management system to one of the supported third-party search engines instead. (See the *CSEE Administrator's Guide* for configuration information.)

When you are using a search engine on your management system, each asset is indexed when it is saved after being created or edited. By default, only the default fields are indexed (for a list, see “Default Columns in the Basic Asset Type Database Table” on page 173). If you want the fields that you created with `PROPERTY` statements in your asset descriptor file to be indexed, you must add statements for them in the following elements:

- `OpenMarketXcelerate/AssetType/YourAssetType/IndexAdd.xml`
- `OpenMarketXcelerate/AssetType/YourAssetType/IndexReplace.xml`
- `OpenMarketXcelerate/AssetType/YourAssetType/IndexCreateVerity.xml`

To add the asset type's custom fields to these elements, use the Content Server `INDEX` tags and follow the convention illustrated in these elements.

## Step 13: Code Templates for the Asset Type

Creating your asset types and coding the templates for assets of that types is an iterative process. Although you need to create asset types before you can create templates for assets of that type, it is likely that you will discover areas that need refinement in your data design only after you have coded a template and tested the code.

For information about coding templates, see Chapter 21, “Coding Elements for Templates and CSElements.”

## Step 14: Move the Asset Types to Other Systems

When you have finished creating all of your new asset types (including creating templates for them), you migrate them to the management and delivery systems. Then, the system administrators configure the asset types for the management system. They enable revision tracking where appropriate, create workflow processes, create Start Menu shortcuts, and so on.

For information about this step, see the *CSEE Administrator's Guide*.

## Deleting Basic Asset Types

When you delete an asset type that was created by AssetMaker, CS-Direct can either delete components of the asset type that you select, or delete all traces of the asset type from the database. A list of asset type components follows:

- The database table and **all the data in it**
- The elements in the ElementCatalog table
- The SQL statements in the SystemSQL table
- The row in the AssetType table
- Any rows in the Association table (optional)
- Any rows in the Category table (optional)
- Any rows in the AssetPublication table
- Any rows in the AssetRelationTree table.

To delete an asset type that you created with AssetMaker, complete the following steps:

1. Open your browser and enter this address:

`http://your_server/Xcelerate/LoginPage.html`

2. Enter your login name and password and click **Login**. Note that you must have administrator rights associated with your user name (login name) in order to have access to AssetMaker.
3. Select the **Admin** tab > **AssetMaker** and then select the asset type that you want to delete.

The **Asset Type** form appears:

4. Select the **Delete Asset** option and click **Submit**.  
CS-Direct displays a confirmation message.
5. Click **OK**.

## Images and eWebEditPro

The eWebEditPro toolbar allows users to upload an image to the management system. However, if your delivery system is dynamic, think carefully before allowing your users to take advantage of this feature. An image that is uploaded in this manner is not an asset, and so it is **not** mirrored published when the asset that uploaded it is published to the delivery system. You must set up a separate file-transfer process to ensure that those images are moved to the delivery system. To avoid the extra step, consider making your images assets and using the association fields to connect an image to another asset.





## Chapter 14

# Designing Flex Asset Types

As mentioned in Chapter 8, “Data Design: The Asset Models,” the data model for flex asset types can be thought of in terms of a family of asset types, with each asset type in the family having several database tables.

You create new flex asset types with the Flex Family Maker utility. However, when working with the flex asset model, developers not only create the flex asset types, they also create the individual data structure assets of those types—that is, flex attributes, flex parent definitions, flex definitions, and flex parent assets.

Typically, you design the flex asset types and create the data structure assets on a development system. Then when your data model is ready, you migrate your work from the development system to the management and delivery systems.

This chapter contains the following sections:

- Design Tips for Flex Families
- The Flex Family Maker Utility
- Creating a Flex Asset Family
- Editing Flex Attributes, Parents, and Definitions
- Using Product Sets

## Design Tips for Flex Families

Your job when designing your flex family is to create a data structure that meets the needs of two audiences:

- The visitors to your online site (that is, the users of your delivery system)
- The content providers who use CS-Direct Advantage to enter data into the Content Server database (that is, the users of the management system)

### Visitors on the Delivery System

The experience of the visitors to your online site is based on the following asset types:

- flex asset
- flex attribute

Your online site pages display flex assets (assetsets) for the visitors through queries that are based on attribute values (searchstates). (See “Assetsets and Searchstates” on page 189.) You use attribute values as the basis for drill-down searches that can give the appearance of a hierarchy on your online site if that is the look and feel that you want.

### Users on the Management System

The users of your management system navigate through a visual hierarchical structure that you create for them with the following flex asset types:

- flex parent definition
- flex definition
- flex parent

Although the organizational structure that you create with these asset types does affect the data — it determines which attribute values are inherited by which flex assets — its biggest impact is on the users of the management system.

You are not required to use flex parents and flex parent definitions, but their inheritance properties make them a valuable tool for users who are maintaining a large amount of data such as an online catalog:

- Changing an attribute value at the parent level changes that value for all the flex assets who are children of that parent, which means you only have to change the value once.
- Inherited attribute values are values that aren't subject to user error during data entry, which means less data cleanup is required.

The inheritance tree that you create for your content providers has no bearing on how your site visitors navigate the online site you are designing. For example, if content is entered into your management system through some completely automated process—perhaps it is bulk loaded from an ERP system—you would have no need for parent asset types at all, yet you can still create drill-down searches on your online site.

## How Many Attribute Types Should You Create?

As described in “Assets and Searchstates” on page 189, only the flex assets that share a common attribute type can belong to the same assetset because queries (searchstates) are based on attributes and not on the organizational constructs of parent definitions and flex definitions.

Therefore, when you design your data structure, remember that if you organize your data to use separate types of attributes, you might create a nicely delineated interface on the management system, but that data cannot be synthesized well on the delivery system and that is rarely what you want.

As a general rule, you should **create one type of attribute** for your system. If you need to, you can create more than one version of the rest of the family members (the flex asset type, flex definition type, flex parent type, and flex parent definition type), but they should still share the same pool of attributes.

For example, if the GE Lighting sample site had been designed such that the product family and the content family shared the same attribute type, you would be able to create assetsets that contained a product and a corresponding article about that product.

## Designing Flex Attributes

Before you begin creating attributes, design them on paper. Determine all the attributes you need and decide where they will appear—with flex assets or the flex parents.

Start by planning out the bottom level of your hierarchy (that is, the individual instances of flex asset types like products) and determine the attributes you need for each item at that level. For example, if you plan to create flex filter assets, determine which attributes need to be created and assigned to the definitions as the input and output attributes for your filters.

You must determine all of the flex attributes that you need before you begin creating them because the way you plan to use them creates dependencies that you must account for when you create them.

## Which Data Types

Assess the data types that are available for attributes and the default input types for those data types. Determine which data types will work best for which attributes. If you want to change the default input style for an attribute, you create an attribute editor for it before you create the attribute. (See Chapter 15, “Designing Attribute Editors.”)

When you create a flex asset that uses an attribute of type `blob`, the format of the value entered for the attribute on an **Inspect** form depends on its type. For example, a text file shows the first 200 bytes in the file. An image file appears as a thumbnail image. And some files cannot be displayed at all. In this case, CS-Direct Advantage displays the message “*filename not displayable*” but the file location is still successfully recorded.

## Using Attribute Editors

The default input type for an attribute depends on the data type that you select for it. If you do not want to use the default input type, you can create an attribute editor for the attribute.

Creating flex assets and their attribute editors is an iterative process. You can create the attribute editors first or you can create the attributes first and then go back and assign the

attribute editors after you have created them. The process of creating attribute editors is described in Chapter 15, “Designing Attribute Editors.”

### Attributes of Type Blob

The default input style of an attribute of type `blob` is a text field with a **Browse** button. You use the **Browse** button to locate and select a file and Content Server uploads it to the default storage directory. You cannot use the CS-Direct Advantage forms to edit the contents of the file.

If you want to be able to enter content directly into the external file through the CS-Direct Advantage forms, you must assign an attribute editor to the attribute:

- If you use an attribute editor that uses the `TEXTAREA` input style, you can create a field that can hold up to 2,000 characters (entered through the forms); when saved, that content is written to the default storage directory.
- If you have eWebEditPro, you can use an eWebEditPro field to edit the contents of the external file that the attribute represents.

### Attributes of Type Asset

The default input style for an attribute of type `asset` is a pull-down list of all the assets of the type specified. An unfiltered pull-down list is not recommended if you have more than 20 assets of that type.

In general, whenever you create an attribute of type `asset`, you should assign it an attribute editor.

- An attribute editor that uses the `PICKASSET` style checks to find out whether the tree is toggled on or off in the Content Server interface. If the tree is on, the user can select an asset from a tab in the tree. If the Tree is toggled off, the attribute editor displays a pop-up window that lists the assets from the **Active List** and `History` tabs.
- Another option is to use the `PULLDOWN` style but to supply a query asset that limits the options that appear in the list.
- If the number of assets that are valid choices is small, you can also use the `CHECKBOXES` or the `RADIOBUTTONS` input style, both of which require a query asset to identify the assets.

## Where Will Each Attribute Be Used?

After you have determined the list of attributes, determine whether you plan to use them in a flex definition or a flex parent definition. Sort them logically by using the following guidelines:

- If an attribute's value is unique to an individual flex asset (product, article, image, for example), the attribute belongs at the bottom of the tree, with the flex asset.
- If an attribute's value is the same for multiple flex assets, the attribute belongs in a parent. (Of course there are always exceptions. For example, even if a toaster costs the same amount as a bowling ball, it is unlikely that they would inherit their prices from a common parent.)
- Based on that attribute distribution, you can determine how many flex definitions you need and how many parent definitions you need.

Remember that there is both a physical limit (based on your DBMS) and a psychological limit (user satisfaction) as to how many attributes you can or should use in an individual flex asset or flex parent. Someone has to enter all those values. Be sure to create and then

assign to the definitions only those attributes that you really plan to use. It is very easy to add attributes in the future if you decide that you need additional ones.

## Dependencies Imposed by Hierarchy

After you know where an attribute will be used, you can determine whether hierarchical concerns add requirements to the attribute. For example, if an attribute is to be used by a flex parent and your data structure allows flex assets to have more than one parent, the attribute must be configured to hold multiple values because a flex asset might inherit more than one value for it.

In general, try not to make the inheritance structure too complex.

## How Many Definition Types Should You Create?

The appearance and input of data on the management system is based on the flex asset definitions and the flex parent definitions. Parents and flex assets appear on tabs in the tree in the Content Server interface based on the hierarchy that you create through the definitions.

In general, it is best to create a separate set of definition types for each flex asset member in a family.

For example, the GE Lighting sample site has two flex asset members in the content family: article (flex) and image (flex). They share parents, parent definitions, and flex definitions. This means that some attributes are left blank for the image assets because they don't apply and some attributes are left blank for the article assets because they don't apply.

It would be better to have article parents, article definitions, and article parent definitions that are different from image parents, image definitions, and image parent definitions. But they should absolutely share the same attribute type, which they do.

## Designing Parent Definition and Flex Definition Assets

The hierarchy on the tabs in the tree in the Content Server interface is created through the flex parent definitions and flex definitions:

- To set a hierarchy three levels deep, you need at least two parent definitions and at least one flex definition.
- To specify a hierarchy two levels deep, you need at least one parent definition and at least one flex definition.

Be sure to consider the basic tenets of usability when you set up a structural hierarchy with the flex definitions and flex parent definitions. For example:

- How deep can the hierarchy go before the content providers feel lost in the tree?
- How many attribute values can be inherited to alleviate the possibility of user error during input?
- How many options can be comfortably displayed in a drop-down list?

If you create a system that is overly difficult to use, the content providers will complain.

## Determining Hierarchical Place

Open CS-Direct Advantage, log in to the GE Lighting sample site, and examine the form for a new product parent definition or for a new product definition.

In the **Parent Definition** section of these forms, you determine two things:

- The hierarchical position of the assets that use this definition and determine
- The parents that they can inherit attributes from

Remember that although the hierarchical position has meaning only in the user interface on the management system, the attributes that they inherit have meaning both on the management system and on your online site.

The text box named **Available** lists all the existing parent definitions. You use this section of the form to specify how many parents are possible by selecting parent definitions from the **Available** list and moving it to the **Selected** list.

When you create a parent asset or a flex asset, the **New** form displays a drop-down field for each definition that you selected from the **Available** list when you created the definition that you are using to create the new parent or flex asset. The drop-down list in the **New** form displays all the parents that were created with that definition.

If the parent that is selected in the **New** form has any attribute values, the asset inherits them.

How many possible parents should you allow? In general, it is best to keep this simple. The more parent definitions you select from the **Available** list, the more fields the content providers have to fill out when they create a new flex asset.

If you do not select a parent definition in the **Available** list, it means that assets created with this definition are positioned at the top level of the tree on the tab that displays your flex assets.

The best way to understand how parent definitions, flex definitions, parent assets, and flex assets interact is to examine the assets delivered with the GE Lighting sample site.

## Determining Attribute Inheritance

You configure attribute inheritance in the **Attributes** section of the parent definition form. You use that section to specify the attributes that define the parents that are created with this definition.

When you create a parent with this definition, the values that are entered for these attributes are passed down to the flex assets that are children of the parent asset.

## How Many Flex Parent Definition Assets?

The simple answer is “as many as you need.” Be sure to consider usability when you decide how many flex parent definition assets you need, and how many parent assets of those definitions that you need.

If you create many parent definitions, it probably means that you will have fewer parents created with each definition, which leads to shorter drop-down lists in the new parent and new flex asset forms. Short drop-down lists make it easier for content providers to select the correct parent from the list.

However, if your data needs require you to have a small number of parent definitions and a large number of parents, create a tab that lists all the parents so the content providers can select the correct parent asset from the tab.

## How Many Flex Definition Assets?

A general rule is this: create enough flex definitions so that fields (attributes) are not left blank on the **New** and **Edit** flex asset forms.

If you create too few definitions, you run the risk of creating long forms with lots of attribute fields, not all of which apply for each asset. When you have long forms with lots of attribute fields, not only do content providers have to sort through the form to determine which attributes apply to the asset they are currently creating, the form takes a long time to be rendered in the user's browser.

## Summary

Keep the following rules in mind as you design the data structure with a flex family for your online site:

- Carefully planned, easy-to-use asset design (data design) makes content providers happy.
- Usable layout and efficient code makes site visitors happy.

And both user groups need efficient systems that perform well.

## The Flex Family Maker Utility

When you create a flex family with Flex Family Maker, it does the following:

- Creates several database tables (the number depends on which flex asset types that you create).
- Writes information about the new flex family to the following tables:
  - `FlexAssetTypes`, which holds a row for each flex asset member type
  - `FlexGrpTplTypes`, which holds a row for each flex parent definition type
  - `FlexGrpTypes`, which holds a row for each flex parent type
  - `FlexTplTypes`, which holds a row for each flex definition type
- Creates new directories in the `ElementCatalog` table using the following naming convention:
 

```
OpenMarket/Xcelerate/AssetType/NameOfYourAssetType
```
- Copies elements from the `ElementCatalog` table to the directories in created for your asset types. CS-Direct Advantage use these elements to format the **New**, **Edit**, **Inspect**, **Search**, and **Search Results** forms for assets of that type.

For information about the main database tables for flex assets and flex parent assets, see “Flex Families and the Database” on page 186. For information about all the database tables in a flex family, see the *CSEE Database Schema Guide*.

## The Flex Asset Elements

When you create a new flex asset type, Flex Family Maker copies elements to the following location in the `ElementCatalog` table:

```
OpenMarket/Xcelerate/AssetType/NameOfAssetType
```

For example, the GE sample site product asset elements are in:

```
OpenMarket/Xcelerate/AssetType/Products
```

It also creates a SQL statement that the search elements use and places it in the `SystemSQL` table under `OpenMarket/Xcelerate/AssetType/NameOfAssetType`.

For a description of the elements and the SQL statement that Flex Family Maker copies for you, see “Elements and SQL Statements for the Asset Type” on page 260. The elements for flex assets are the same as the elements for the basic assets with the exception of the `AppendSelectDetailsSE` element.

## Creating a Flex Asset Family

When you are using the flex asset data model to represent the content you want to display on your online site, you and the other developers do not create only the flex asset types. You also create the individual data structure assets of those types: flex attributes, flex parent definitions, flex definitions, and flex parent assets.

### Overview

Following is an overview of the process for creating a new flex asset type or family of flex asset types. Where you start in the process depends how many asset types you need to design. If you can base your data structure on either of the sample site flex families, you do not have to create an entire flex family—you can create only the new members that you need.

This chapter describes each of the following steps in the process, except as noted:

1. Create the new flex family or new member of the flex family.
2. Configure the development system so that you have easy access to the new asset types:
  - a. Enable the new asset types on all the CSEE sites on the development system.
  - b. Create **Start Menu** shortcuts for all the new asset types.
  - c. Put the new flex definition, flex parent definition, and attribute types on the **Design** tab.
  - d. Create a tab for your new flex parent and flex asset types.
3. Create the flex attributes and design your attribute editors. For information about attribute editors, see Chapter 15, “Designing Attribute Editors.”
4. Create the flex filter assets.
5. Create the flex parent definitions.
6. Create the flex definitions.
7. Create the flex parents.
8. Test your design by creating enough flex assets to examine the data structure that you have designed. (Procedures for creating assets are presented in the *CSEE User's Guide*.)
9. Create templates for the flex assets, the flex member of the flex family. This step is described in Chapter 19, “Creating Template, CSElement, and SiteEntry Assets” and Chapter 21, “Coding Elements for Templates and CSElements.”
10. Move your asset types to other systems (management and delivery). This step is described in the *CSEE Administrator's Guide*.



## Before You Begin

Be sure to set up your development system and get access to it, as follows:

- Create the appropriate CSEE sites.
- Create a user name for yourself that has administrator rights, and enable that user name on all of the sites on your development system. Note that without administrator rights, you do not have access to the **Admin** tab, which means that you cannot perform some of the procedures in this chapter.

For the sake of convenience, assign the **Designer** and **GeneralAdmin** roles to your user name. That way you will have access to all the tabs in the Content Server interface and all of the existing **Start Menu** shortcuts for the assets in the sample site. (Be sure that the TableEditor ACL is assigned to your user name.)

- If you plan to use eWebEditPro, a third-party HTML editor from Ektron, Inc., you must obtain it from FatWire (contact your FatWire sales representative) and configure it on the systems that you plan to use it on. It is not delivered with CS-Direct (or CS-Direct Advantage).

For information about these tasks, see the *CSEE Administrator's Guide*.

## Step 1: Create a Flex Family or a New Flex Family Member

To create a new family for your data, complete the following steps:

1. Open your browser and enter this address:  
`http://your_server/Xcelerate/LoginPage.html`
2. Enter your login name and password and click **Login**. Note that you must have administrator rights associated with your user name (login name) in order to have access to the **Admin** tab, which is where **Flex Family Maker** is located.
3. Select **Admin > Flex Family Maker**.

The Flex Family Maker form appears:

Add New Flex Family

Create New
<b>*Flex Attribute:</b> Name: <input type="text" value="testAttr1"/>
<b>*Flex Parent Definition:</b> Name: <input type="text" value="testPD1"/>
<b>*Flex Definition:</b> Name: <input type="text" value="testFD1"/>
<b>*Flex Parent:</b> Name: <input type="text" value="testFP1"/>
<b>*Flex Asset:</b> Name: <input type="text" value="testFA1"/>
<b>Flex Filter:</b> Name: <input type="text" value="testFF1"/>
<input type="button" value="Cancel"/> <input type="button" value="Continue"/>

4. For **Flex Attribute**, do one of the following:

- If you are creating a completely new flex family — all five members — click in the **Name** field and enter the name of the new flex attribute type.

The name you enter in this field is the internal name of the new attribute type. It becomes the name of the core table for this asset type and the prefix for all its auxiliary tables.

- If you are creating a family that shares attributes with another family, select the appropriate attribute type from the drop-down field.

5. For **Flex Parent Definition**, do one of the following:

- If you are creating a completely new flex family — all five members — or creating a new family that shares attributes with another family, click in the **Name** field and enter the name of the new flex parent definition.

The name you enter in this field is the internal name of the new parent definition type. It becomes the name of the core table for this asset type and the prefix for all its auxiliary tables.

- If you are creating a family that shares attributes and parents, select the appropriate parent definition from the drop-down field.

6. For **Flex Definition**, click in the **Name** field and enter the name of the new flex definition.

The name you enter in this field is the internal name of the new flex definition type. It becomes the name of the core table for this asset type and the prefix for all its auxiliary tables.

7. For **Flex Parent**, do one of the following:

- If you are creating a completely new flex family — all five members — or creating a new family that shares attributes with another family, click in the **Name** field and enter the name of the new flex parent asset type.

The name you enter in this field is the internal name of the new parent type. It becomes the name of the core table for this asset type and the prefix for all its auxiliary tables.

- If you are creating a family that shares attributes and parents, select the appropriate parent from the drop-down field.

8. For **Flex Asset**, click in the **Name** field and enter the name of the new flex asset type.

The name you enter in this field is the internal name of the new flex asset type. It becomes the name of the core table for this asset type and the prefix for all its auxiliary tables.

9. For **Flex Filter**, click in the **Name** field and enter the name of the new flex filter asset type.

The name you enter in this field is the internal name of the new flex filter asset type. It becomes the name of the core table for this asset type and the prefix for all its auxiliary tables.

10. Click **Continue**.

Flex Family Maker displays the following form:

**Add New Flex Family**

<b>Flex Attribute:</b>	testAttr1
*Description:	<input type="text"/>
*Plural Form:	<input type="text"/>
<b>Flex Parent Definition:</b>	testPD1
*Description:	<input type="text"/>
*Plural Form:	<input type="text"/>
<b>Flex Definition:</b>	testFD1
*Description:	<input type="text"/>
*Plural Form:	<input type="text"/>
<b>Flex Parent:</b>	testFP1
*Description:	<input type="text"/>
*Plural Form:	<input type="text"/>
<b>Flex Asset:</b>	testFA1
*Description:	<input type="text"/>
*Plural Form:	<input type="text"/>
<b>Flex Filter:</b>	testFF1
*Description:	<input type="text"/>
*Plural Form:	<input type="text"/>

11. For each new member of the family, click in the **Description** field and enter the external name of the asset type, that is, the name of the asset type when it is displayed in CS-Direct Advantage. This is the name that appears on the forms (**New**, **Edit**, **Inspect**, and so on).
12. For each new member of the family, click in the **Plural** field and enter the plural version of its name. This version is used in status messages and so on when appropriate.
13. Click **Add New Flex Family**.

Flex Family Maker creates the database tables that will store assets of these types. For information about these tables, see “Flex Families and the Database” on page 186.

It also copies elements that format the forms for assets of these types to a directory with the name of the asset type in the ElementCatalog and SystemSQL tables.

## Step 2: Enable the New Flex Asset Types

Before you can start creating assets (attributes, flex parent definitions, and so on), you must complete some steps on the **Admin** tab so that you have access to them. Note that your login must grant you administrator rights in order for you to have access to the **Admin** tab.

Complete the following steps:

1. On the **Admin** tab, click the **Sites** icon and complete the following steps:
  - a. Select the site that you are going to use to work with this asset type.
  - b. Under that site, select **Asset Type > Enable**.
  - c. Select your new asset types from the list and click **Enable**.
  - d. Repeat steps a through c for each appropriate site.
2. Tell your site administrator to create a start menu shortcut for the asset types that you have created. As the developer of the asset types and the designer of the online site, your responsibility is to let the administrator know enough about your asset and site design that the site administrator can configure meaningful Start Menu shortcuts.

You (the developers) must let the site and system administrators know which fields are used by the queries, collections, or other design elements for your online site so that they can create meaningful Start Menu shortcuts for the content providers. For more information about creating Start Menu shortcuts, see the *CSEE Administrator's Guide*.

After your administrator has created Start Menu shortcuts for your new asset types, you can create assets of these types. Note that even if you add your asset types to a tab, you will not be able to create new assets until you have created Start Menu shortcuts for them.

### Step 3: Create Flex Attributes

Because the steps that you follow can differ significantly based on the data type that you select for your attribute, this section presents several procedures:

- A basic procedure for creating attributes of most data types
- Creating attributes of type `blob`

#### Note

The `url` data type has been deprecated in the 4.0 version of the product. Use the `blob` data type instead.

- Creating attributes of type `asset`
- Creating foreign attributes (that is, attributes that are stored in a foreign table)

## Creating Flex Attributes: the Basic Procedure

1. If the Content Server interface is not open, log in and select the appropriate site.
2. Click **New** and select the name of your attribute type from the list of shortcuts.

The **New** attribute form appears. For example, here's the **New Product Attribute** form from the GE Sample site:

Product Attribute:

---

---

**\*Name:**   
**Description:**

---

**Value Type:**   
**Asset Type:**   
(if Asset)

☒ Exists - Any approved version of the associated asset is acceptable for publish of Product Attribute.  
☐ Exact version - Any change to the associated asset will require approval for publish of Product Attribute.

---

**Mirror Dependency Type:**   
(if Asset)

**Folder:**   
(if URL)

**Allow Embedded Links:** ☐ Yes ☒ No  
(if Text, Blob or URL)

**Number of Values:**

**Attribute Editor:**

---

**Editing Style:**

**Storage Style:**

**External ID:**

**External Table:**

**External Column:**

---

**Content Type :**

---

**Search Engine:**

**ISO Character Set:**

**Conversion Engine to plain text:**

---

**Conversion Engine (to HTML):**

**Diff Presentation:** ☒ None ☐ In-line ☐ Summary ☐ Window

---

3. Click in the **Name** field and enter a name of up to 64 characters, excluding spaces.
4. Click in the **Description** field and enter a short, descriptive phrase that describes the use or function of the attribute.
5. Click in the **Value Type** field and select a data type for this attribute. (If you select **asset** or **blob**, see “Creating Flex Attributes of Type Asset” on page 303 or “Creating Flex Attributes of Type Blob (Upload Field)” on page 302, as appropriate.)

If you need help deciding which data type is appropriate for your attribute, see “Data Types for Attributes” on page 180.

6. Click in the **Number of Values** field and select either **single** or **multiple** from the drop-down list, as appropriate for the data type that you selected in the **Value Type** field.

If this attribute is to be used by a flex parent and your data structure allows flex assets to have more than one flex parent, you must select **multiple** because the flex assets who inherit values for this attribute might inherit a value from more than one parent.

#### Note

When an attribute is configured to accept multiple values, it appears on the flex parent and flex asset forms as a field with an **Add Another *attribute name*** button.

If you want the attribute to accept multiple values for inheritance reasons but you do not want content providers to select more than one value for the attribute for individual parents or flex assets, assign the attribute an attribute editor that presents it as a single value field (but select multiple in the **Value Type** field).

7. (Optional) If you do not want to use the default input type for this attribute (which is based on the data type that you selected in the **Value Type** field), click in the **Attribute Editor field** and select one from the drop-down list.

If you need more information:

For a list of the default input types (so you can determine whether you want to use an attribute editor instead), see “Default Input Styles for Attributes” on page 181.

For information about creating attribute editors, see Chapter 15, “Designing Attribute Editors.”

For information about which attribute editors are appropriate for the data type of this attribute, see “The Attribute Editor Asset” on page 323.

8. (Optional) If your management system is configured to use the AltaVista search engine rather than the default SQL database search feature on the **Search** forms and you want to index the values that flex assets have for this attribute, click in the **Search Engine** field and select AltaVista.
9. (Optional) If you need to override the default ISO character set (ISO 8859-1), click in the **ISO Character Set** field and enter the one you want to use for this attribute.
10. Click **Save**.

## Creating Flex Attributes of Type Blob (Upload Field)

To create an attribute of type `blob`, complete the following steps:

1. Complete steps 1 through 4 in the procedure “Creating Flex Attributes: the Basic Procedure” on page 301.
2. Click in the **Value Type** field and select `blob`.
3. (Optional) Click in **Folder** field and enter a path to the directory that you want to store the attribute values in. Note that the value that you enter in this field is appended to the value set as the default storage directory (`defdir`) for the `MongoBlobs` table.

4. Click in the **Number of Values** field and select **single** or **multiple**, as appropriate. For more information about this field, see “Creating Flex Attributes: the Basic Procedure” on page 301.
5. (Optional) If you do not want to use the default input type (a **Browse** button), click in the **Attribute Editor** field and select one of the following:
  - An attribute editor that specifies the TEXTAREA input style
  - If your system is configured to use eWebEditPro, an attribute editor that specifies the EWEBEDITPRO input style

For information about attribute editors, see “The Attribute Editor Asset” on page 323.
6. Complete steps 8 through 10 of the procedure “Creating Flex Attributes: the Basic Procedure” on page 301.

## Creating Flex Attributes of Type Asset

To create an attribute of type **asset**, complete the following steps:

1. Complete steps 1 through 4 in the procedure “Creating Flex Attributes: the Basic Procedure” on page 301.
2. Click in the **Value Type** field and select **asset**.
3. Click in the **Asset Type** field and select one from the drop-down list.
4. Click in the **Mirror Dependency Type** field and select a dependency type.
5. Click in the **Number of Values** field and select either **single** or **multiple** from the drop-down list, as appropriate for the data type that you selected in the **Value Type** field.

If this attribute is to be used by a flex parent and your data structure allows flex assets to have more than one flex parent, you must select **multiple** because the flex assets who inherit values for this attribute might inherit a value from more than one parent.

6. (Optional) If the number of assets of the type you selected in the **Number of Values** field is more than 20, click in the **Attribute Editor field** and select one. See “Using Attribute Editors” on page 291 for information about appropriate attribute editors.
7. Complete steps 8 through 10 of the procedure “Creating Flex Attributes: the Basic Procedure” on page 301.

## Creating Foreign Flex Attributes

If you keep data in another system (a price list, for example) that you also want to use for your flex assets, you can create a foreign attribute that points to the column in the foreign table whose data you want to use as a flex attribute.

Before you begin, be sure to register the foreign table with Content Server. For information, see “Registering a Foreign Table” on page 215.

To create a foreign attribute, complete the following steps:

1. Complete steps 1 through 6 in the procedure “Creating Flex Attributes: the Basic Procedure” on page 301. Note that you **cannot** select either **asset** or **blob** (or url) in the **Value Type** field.

2. (Optional) If you plan to use the CS-Direct Advantage flex asset forms to enter values for the attribute into the foreign table and you do not want to use the default input type for the data type that you selected in the **Value Type** field, click in the **Attribute Editor** field and select an appropriate one.
3. Click in the **Editing Style** field and do one of the following:
  - If you want to use the CS-Direct Advantage forms to enter values into this attribute's fields for the flex assets that use it, select **local**.
  - If you do not want users to be able to write values to this table through the CS-Direct Advantage forms, select **external**.
4. Click in the **Storage Style** field and select **external** from the drop-down list.
5. Click in the **External ID** field and specify the name of the column that serves as the primary key for the table that holds this foreign attribute, that is, the column that uniquely identifies the attribute.
6. Click in the **External Table** field and enter the name of the table that stores this attribute.
7. Click in the **External Column** and enter the name of the column in the table specified in the **External Table** that holds the values for this attribute.
8. Complete steps 9 through 11 of the procedure "Creating Flex Attributes: the Basic Procedure" on page 301.

## Step 4: (optional) Create Flex Filter Assets

Before you can create flex filter assets, the flex attributes that you plan to use as the input and output attributes must already be created. If the appropriate flex attributes do not exist yet, create them before continuing with this procedure. Note the following requirements:

- For flex filters that use the Document Transformation filter type, the input and output attributes must be of type `blob`.
- For any flex filter, the input attribute, output attribute, and flex filter must all belong to the same flex family.

To create a flex filter asset, complete the following steps:

1. If the Content Server interface is not open, log in and select the appropriate site.
2. Click **New** and then select the name of your flex definition asset type from the list of shortcuts.



The **New** filter form appears:

**Flex Family Maker: New Filter Asset Type**

<b>*Name:</b>	<input type="text"/>
<b>*Description:</b>	<input type="text"/>
<b>*Plural Form:</b>	<input type="text"/>

3. In the **Name** field, enter a name of for the flex filter asset. You can use up to 64 characters.
4. In the **Description** field, enter a description of the filter asset.
5. In the **Filter** field, select one of the registered filters from the drop-down list. By default, there is only one registered filter: **Document Transformation**. For information about this filter type, see “Flex Filters” on page 184.

**Note**

If your system has any custom filters registered, they will also appear in this drop-down list. Custom filters use custom arguments.

This procedure describes how to configure values for the Document Transformation filter. If you select a custom filter, be sure that you specify appropriate values for its arguments.

6. Click **Get Arguments**.

The **New Filter** form displays the **Arguments** fields:

**New HTML transforming filter**

---

Cancel Save

\*Name:

Description:

---

\*Filter: Document Transformation Get Arguments

---

Arguments: Document transformer name Add [Value] Remove

---

Cancel Save

7. Specify the **Document transformer name** argument for the **Document Transformation** filter as follows:

- From the top **Arguments** field, select **Document transformer name** from the drop-down list.
- Click in the **Arguments** ([Value]) field and enter the following text, exactly as it is presented:  
Verity: Convert to HTML
- Click **Add**.

**Note**

By default, the **Verity: Convert to HTML** transformation engine is the only registered engine that you can specify for the **Document transformer name** argument. For information about configuring the Verity transformation engine so that it can also convert documents to XML, see “Registering a New Transformation Engine” on page 317.

8. Specify the **Output document extension** argument for the **Document Transformation** filter as follows:

- From the top **Arguments** field, select **Output document extension** from the drop-down list.
- Click in the **Arguments** ([Value]) field and enter: .htm
- Click **Add**.

9. Specify the **Input attribute name** argument for the **Document Transformation** filter as follows:
  - a. From the top **Arguments** field, select **Input attribute name** from the drop-down list.
  - b. Click in the **Arguments** ([Value]) field and enter the name of the flex attribute whose contents will be converted to HTML by this filter and then stored in the output variable. This attribute must already exist and it must be of type `blob`.
  - c. Click **Add**.
10. Specify the **Output attribute name** argument for the **Document Transformation** filter as follows:
  - a. From the top **Arguments** field, select **Output attribute name** from the drop-down list.
  - b. Click in the **Arguments** ([Value]) field and enter the name of the flex attribute that holds the data that the filter converts to HTML. This attribute must already exist and it must be of type `blob`.
  - c. Click **Add**.
11. Click **Save**.

This filter will now appear in the **Filter** list on the **New** and **Edit** forms for your flex parent definition and flex definition assets.

## Step 5: Create Parent Definition Assets

Complete the following steps:

1. If the Content Server interface is not open, log in and select the appropriate site.
2. Click **New** and select the name of your product definition asset from the list of shortcuts.

The **New** form appears. For example, this is the **New** form for the GE sample site product parent definition asset type:

**New Product Parent Definition**

Cancel Save

\*Name:

Description:

Parent Select Style:

**Product Parent Definitions:**

Available	Single Value:	Selected
Category	<input type="button" value="Required"/>	
SubCategory	<input type="button" value="Optional"/>	
	<b>Multiple Values:</b>	
	<input type="button" value="Required"/>	
	<input type="button" value="Optional"/>	
	<input type="button" value="Remove"/>	

**Attributes:**

Available	Single Value:	Selected	Display Order:
ballasttype	<input type="button" value="Required"/>		<input type="button" value="Up"/>
baseimage	<input type="button" value="Optional"/>		<input type="button" value="Down"/>
basetype			
beamspread			
bulbimage			
bulbshape			
bulbsize			
caseqty			
cat1			
cat2			
colorrenderingindex			
colortemp			

Cancel Save

3. Click in the **Name** field and enter a name of up to 64 characters.
4. Click in the **Description** field and enter a short, descriptive phrase that describes the parent definition.
5. Click in the **Parent Select Style** field and determine how flex parents that use this definition will be selected on the parent asset forms. Do one of the following:
  - If the number of parents of this type will be small, choose **Select Boxes**. Then, all the parents of this type will be displayed as options in a drop-down field on the flex asset forms.
  - If the number of parents of this type will be large, choose **Pick From Tree**. Then, when you select a parent of this type on the flex asset form, you select it from the tree on the tab that displays your catalog data. For example, on the GE Sample site, the catalog data is displayed in a tree on the **Catalog** tab.
6. Select a parent definition from the **Available** list. For information about selecting parent definitions, see “Determining Hierarchical Place” on page 293.

7. Click the appropriate arrow button, as described in this table:

Button in parent definition form	Creates a field in the New parent form that does the following:
Single Value (Required)	Forces you to select one parent for the field.
Single Value (Optional)	Allows you to select only one parent for the field.
Multiple Value, (Required)	Forces you to select at least one parent asset for the field.
Multiple Value (Optional)	Allows you to select more than one parent asset for the field.

CS-Direct Advantage moves the parent definition from the **Available** list to the **Selected** list.

8. Repeat steps 6 and 7 as many times as necessary. Remember that the corresponding **New** parent form will include a field for each item that you select in the **Available** list on this parent definition form.
9. In the **Attributes** section, select the appropriate attributes. Note that if you are going to assign a flex filter asset to this parent definition, you must include the input and output attributes that the flex filter uses.
10. Do one of the following:
  - Click the **Required** button to specify that the attribute is required, that is, that all flex parents created with this definition must have a value for this attribute.
  - Click the **Optional** button to specify that the attribute is optional.
11. (Optional) If you did not select the attributes in the order in which you want them to appear on the parent form for parents of this type, use the arrow buttons to the right of the **Selected** box to order them.
12. (Optional) In the **Filters** section, select any flex filter assets that are appropriate for this parent definition.
13. Click **Save**.
14. Repeat this procedure for each parent definition asset that you need to create.

## Step 5: Create Flex Definition Assets

Complete the following steps:

1. If the Content Server interface is not open, log in and select the appropriate site.
2. Click **New** and then select the name of your flex definition asset type from the list of shortcuts.

The **New** form appears. For example, this is the **New** form for the GE Lighting sample site product definition asset:

**New Product Definition**

Cancel Save

\*Name:

Description:

Template: No templates available

---

**Product Parent Definitions:**

Available

- Category
- SubCategory

Single Value:

► Required

► Optional

Multiple Values:

► Required

► Optional

Remove ◀

Selected

---

**Attributes:**

Available

- ballasttype
- baseimage
- basetype
- beamspread
- bulbimage
- bulbshape
- bulbsize
- caseqty
- cat1
- cat2
- colorrenderingindex
- colortemp

► Required

► Optional

Remove ◀

Selected

Display Order:

▲

▼

Cancel Save

3. Click in the **Name** field and enter a name of up to 64 characters.
4. Click in the **Description** field and enter a short, descriptive phrase that describes the parent definition.
5. Select a parent definition from the **Available** list. For information about selecting parent definitions, see “Determining Hierarchical Place” on page 293.
6. Click the appropriate arrow button, as described in the following table:

Button in flex definition form	Creates a field in the New flex asset form that does the following:
Single Value (Required)	Forces you to select only one parent in the field.
Single Value (Optional)	Allows you to select only one parent in the field.
Multiple Value (Required)	Forces you to select at least one parent asset in the field.
Multiple Value (Optional)	Allows you to select more than one parent asset in the field.

CS-Direct Advantage moves the parent definition from the **Available** list to the **Selected** list.

7. Repeat steps 5 and 6 as many times as is necessary. Remember that the corresponding **New** flex asset form will include a field for each item that you select in the **Available** list on this flex definition form.
8. In the **Attributes** section, select an attribute. Note that if you are going to assign a flex filter asset to this flex definition, you must include the input and output attributes that the flex filter uses.
9. Do one of the following:
  - Click the **Required** button to specify that the attribute is required; that is, that all flex assets created with this definition must have a value for this attribute.
  - Click the **Optional** button to specify that the attribute is optional.
10. (Optional) If you did not select the attributes in the order in which you want them to appear on the **New** and **Edit** forms for flex assets created with this definition, use the arrow buttons to the right of the **Selected** box to order them.
11. (Optional) In the **Filters** section, select any flex filter assets that are appropriate for this flex definition.
12. Click **Save**.
13. Repeat this procedure for each flex definition that you need to create.

## Step 6: Create Flex Parent Assets

Complete the following steps:

1. If the Content Server interface is not open, log in and select the appropriate site.
2. Click **New** and then select the name of your flex parent asset type from the list of shortcuts.

The **New** form appears. For example, this is the **New** form for the GE Lighting sample site product parent asset:

New Product Parent

Name:

\*Product Parent Definition:

3. Click in the **Parent Definition** field and select one from the drop-down list. The definition you select formats the next form, the form you fill out to define this parent asset.

The second **New Parent** form appears.

New Product Parent

---

\*Name:

Description:

---

Product Parent Definition: SubCategory

---

Product Parents:

Category (S):  ▼

---

\* cat2:

---

4. Click in the **Name** field and enter a name of up to 64 characters.
5. The fields displayed in the **Parent** section of the form depends on the parent definition you chose for this parent. The parents that you select in these fields are the grandparents of any flex assets that have the parent you are creating in this procedure. If you do not select any parents (grandparents), the parent you are creating is a top-level parent in the tree tab that displays your flex assets.

Note the following about the kinds of fields that might appear in this section:

- If there is an (S) next to a field, you can select one grandparent from the drop-down list.
  - If there is an asterisk (\*) and an (S) next to the field, you must select one grandparent from its drop-down list.
  - If there is an (M) next to a field, you can select more than one grandparent from its drop-down list.
  - If there is both an asterisk (\*) and an (M) next to a field, you must select at least one grandparent from its drop-down list.
6. In the attributes section of the form, fill in the appropriate values for this parent. If a field has an asterisk (\*) next to it, it is a required field.

The fields displayed in this section are based on the parent definition you chose for this parent. The values that you enter into these fields are inherited by any flex assets that have this parent asset as their parents.

7. Click **Save**.

CS-Direct Advantage writes the new parent to the database. All the information other than the attribute values are written to the *FlexParent*, *FlexParent\_AMap*, and *FlexParent\_Extension* tables, where *FlexParent* represents the internal name of your flex parents. The attribute values are written to the *FlexParent\_Mungo* table.



## Step 8: Code Templates for the Flex Assets

Creating your flex asset definitions and coding the templates for the flex assets that use those definitions is an iterative process. Although you need to create definitions and flex assets before you can create templates for your flex assets, it is likely that you will discover areas that need refinement in your data design only after you have coded a template and tested the code.

For information about coding elements for your templates, see Chapter 21, “Coding Elements for Templates and CSElements.”

## Step 9: Test Your Design (Create Test Flex Assets)

To thoroughly test your design, you must create some flex assets so that you can examine where they appear on the tree, what their forms look like, how long it takes to load their forms, and so on.

For information about creating new assets, see the *CSEE User's Guide*.

## Step 10 (optional): Create Flex Asset Associations

In most cases, you should use a flex asset's attributes to form associations. In the rare case that your associations must work across flex definitions, create associations between flex assets by completing the following steps:

1. Log in to the CSEE user interface as a user with general administrator privileges.
2. On the **Admin** tab of the tree, click the **Asset Type** node.
3. Click on the plus sign next to asset type you wish to create an association for.
4. Click on the plus sign for the **Asset Associations** node.
5. Click **Add New**. The following screen appears:

Add New Association

<b>Asset Type:</b>	Article (Flex)
<b>*Name:</b>	<input type="text"/> (Name cannot contain spaces or punctuation.)
<b>*Description:</b>	<input type="text"/>
<b>Child Asset:</b>	Image (Flex) ▾
<b>Article (Flex) Subtypes:</b>	<div> CSystems  DrillHierarchyCT  Story </div>
<b>Mirror Dependency Type:</b>	<input checked="" type="radio"/> Exists - Any approved version of the associated asset is acceptable for publish of Article (Flex). <input type="radio"/> Exact version - Any change to the associated asset will require approval for publish of Article (Flex).

6. Click in the **Name** field and enter a name.

7. Click in the **Description** field and enter a description of the association.
8. Select a child asset to associate with this asset using the **Child Asset** drop-down select box.
9. Select one or more sub-types using the **Subtypes** field.
10. Choose a dependency type for the associated flex asset using the **Mirror Dependency Type** radio buttons.
11. Click **Add New Association** to associate the flex asset types.

## Step 11: Move the Asset Types to Other Systems

When you have finished creating your flex family— which includes creating the new flex asset types with Flex Family Maker, creating the data structure assets (including attribute editors), and coding templates for the flex asset type—you move them to the management and delivery systems.

Then, the system administrators configure the asset types for the management system. They enable revision tracking where appropriate, create workflow processes, create Start Menu shortcuts, and so on.

For information about moving your asset types to the management and delivery systems, see the *CSEE Administrator's Guide*.

## Editing Flex Attributes, Parents, and Definitions

Editing most of the flex asset types requires careful planning because certain edits cause schema changes and **schema changes cause data loss**.

This section presents tips and advice about editing flex family asset types.

### Editing Attributes

Note the following when editing a flex attribute:

- You can change the **Name** without causing a schema change. However, if you are using XMLPost to import flex assets into your Content Server database, you must edit your XMLPost files if you change the name of an attribute.
- You can change the **Description** without causing data loss.
- If you change the data type in the **Value Type** field, you **lose all data** associated with the attribute in the \_Mungo table(s) that use this attribute type.
- If the attribute's data type is **asset** and you change the asset type, **all existing data for the attribute is invalid**.
- If you change the **Folder** field for a blob attribute, CS-Direct Advantage will no longer be able to find any existing data for that attribute. If you absolutely must change this value, you need to move the file system to match the new value that you set.
- You can change the **Number of Values** from single to multiple without causing data loss or complications.

- If you change the **Number of Values** from multiple to single, CS-Direct Advantage cannot determine which of the values in any existing rows are the values to keep.
- You can change the **Search Engine** and **ISO Character Set** without causing data loss.

## Editing Parent Definitions and Flex Definitions

Note the following when editing a parent definition or a flex definition:

- You can change the **Name** without causing a schema change. However, if you are using XMLPost to import flex assets into your Content Server database, you must edit your XMLPost files if you change the name of a parent definition.
- You can change the **Description** and the **Parent Select Style** fields without causing data loss.
- If you change the parent selections:
  - Adding parents is allowed
  - Removing parents can cause assets to no longer have valid data.
  - Changing parents from optional to required can cause problems because parents or flex assets who do not have one of the newly required parents are no longer valid.
  - Changing parents from required to optional is allowed.
  - Changing parents from single value to multiple value is allowed.
  - Changing parents from multiple value to single value causes unpredictable results because CS-Direct Advantage can't know which of the previously acceptable multiple values is the one to keep and which ones to remove.
- If you change the attribute selections:
  - Adding optional attributes is allowed.
  - Adding required attributes causes existing parents or flex assets without them to be invalid.
  - Removing attributes causes existing parents or flex assets with such an attribute value to be invalid.

## Editing Parents and Flex Assets

Note the following when editing a flex or parent asset:

- You can change the **Name** without causing a schema change. However, if you are using XMLPost to import flex assets into your Content Server database, you must edit your XMLPost files if you change the name of a parent definition.
- You can change the **Description** without causing data loss.
- If you change parents, CS-Direct Advantage corrects all the inherited attribute values.
- You cannot change the definition that you used to create the parent or flex asset.
- Changing the value of an attribute is allowed. If you change the value of an attribute for a parent, CS-Direct Advantage corrects that attribute for all the assets that inherited it from this parent. Changing the attribute value for a flex asset is allowed.

## Using Product Sets

When you are using CS-Direct Advantage to manage an online catalog, there is a special feature that you can use with product assets called a **product set**. Product sets allow you to group products that are actually the same product except that they are packaged and sold differently.

### What Is a Product Set?

For example, a book is the same book whether it is the paperback version or the hard-cover version. And a soft drink is the same soft drink whether it is sold in individual cans, as a six-pack, in a 2-liter bottle, or a case.

Product sets allow you to group products like these together so that they can be displayed together (in the same form) on the management system, yet remain individual saleable units, identified as such by their SKUs.

The model for the product set feature is as follows:

- The product set is a product parent that takes on the characteristics of a product asset. The product set (parent) has all of the attributes that define the core product.
- The product assets are SKUs. That is, they have only those attributes that describe the packaging or are the unique identifiers for members of the set: the SKU, the bottle size, and so on.
- The product set (parent) has an attribute that marks it as a product set and the value of this attribute is unique among all the product sets. This attribute is called **GAProductSet** and is a reserved name. The products in the set inherit this attribute and, by this inheritance, are marked as members of that product set (that is, children of that product parent).

### Creating Product Sets

To create a product set, complete the following steps:

1. Create a product attribute named **GAProductSet**. This is a reserved name and your attribute name must match it exactly.
2. Create a new product parent definition and select the **GAProductSet** attribute.
3. Create a new product definition and designate that the parents created with the definition that you created in step 2 can be parents of products created with this product definition.
4. Create a new product parent from the definition you created in step 2.
5. Using the product definition that you created in step 3, create the products in the set and designate that the parent that you created in step 4 is their product parent.

Now, when you inspect or edit the product set (product parent), each product (SKU) in the set is listed on the **Product Parent** form, presenting a representation of the product set relationship.

There can be only one **GAProductSet** attribute in the Content Server database. If you have more than one CSEE site and you want to create product sets in more than one site, you must share the **GAProductSet** attribute to the sites that you want to use it in.

## Custom Filter Classes or Transformation Engines

This section describes how to register a new filter class or transformation engine.

### Registering a New Filter Class

To register a new filter class, complete the following steps:

1. Copy your .jar or class file to the directory that holds the Content Server product jars:
  - For WebLogic: *app-server-install-dir/boa/path-to-domain/domain-name/applications/WEB-INF/lib*
  - For WebSphere: *WebSphere-Installation-Directory/InstalledApps/WEB-INF/lib*
  - For Sun ONE: *domain-name/application-name/applications/J2ee-apps/ContentServer/cs\_war/WEB-INF/lib*
  - For Oracle Application Server: use the Oracle Admin console to deploy the .jar file.
2. Open CS-Explorer and add a row to the `Filters` table for the new filter class, as follows:
  - a. Select the `Filters` table.
  - b. Either select **File > New > Record**, or select select **New** from the right-mouse menu.
  - c. Enter the name of the filter class in the name column.
  - d. Enter a description of the filter class in the description column.
  - e. Enter the exact name of the filter class in the `classname` column.
  - f. Select **File > Save**.

Your filter class is registered and will now be displayed in the **Filter** drop-down list in the **New** and **Edit** forms for filter assets.

### Registering a New Transformation Engine

The Document Transformation filter class can invoke any registered transformation engine, that is, a transformation engine with an entry in the `SystemTransforms` table. By default, Verity Keyview is the only transformation engine that is installed. Also by default, this engine is configured to convert documents to HTML. If you install the AltaVista search engine, that transformation engine is also present in the `SystemTransforms` table.

If appropriate, you can register your own transformation engines to use with the Document Transformation filter class. For example, because the Verity Keyview engine is also capable of converting documents to XML, you can create another entry for the Verity Keyview engine and configure it to convert documents to XML.

To register a new transformation engine, complete the following steps:

### Note

If you are adding another instance of the Verity Keyview engine to the `SystemTransforms` table so that you can configure it to convert documents to XML, do not complete step 1 of this procedure. The Keyview class file is already in the appropriate place so you should start with step 2.

1. Copy the .jar or class file of the transformation engine to the directory that holds the Content Server product jars:
  - For WebLogic: *app-server-install-dir/boa/path-to-domain/domain-name/applications/WEB-INF/lib*
  - For WebSphere: *WebSphere-Installation-Directory/InstalledApps/WEB-INF/lib*
  - For Sun ONE: *domain-name/application-name/applications/J2ee-apps/ContentServer/cs\_war/WEB-INF/lib*
  - For Oracle Application Server: use the Oracle Admin console to deploy the .jar file.
2. Open CS-Explorer and add a row to the `SystemTransforms` table for the new transformation engine, as follows:
  - a. Select the `SystemTransforms` table.
  - b. Either select **File > New > Record**, or select **New** from the right-mouse menu.
  - c. In the name column, enter the name of the transformation engine. For example: `Verity_Convert_to_XML`
  - d. In the description column, enter a description of the engine. For example: `Convert to XML using Verity Keyview`
  - e. In the target column, enter `text/filetype`. For example: `text/XML`
  - f. In the `classname` column, enter the **exact** name of the engine class. For example, if you are creating an additional entry for the Verity Keyview engine, copy and paste the classname from the Verity: Convert to HTML row. (Its classname is `com.openmarket.Transform.Keyview.KeyviewTransform`.)
  - g. In the `args` column, set any arguments that are appropriate for this transformation engine. For example, if you are creating an additional entry for the Verity Keyview engine, enter `exporttype=XML`
  - h. Select **File > Save**.

Your transformation engine is registered. You can now use this transformation engine with your Document Transformation filter assets.

## Chapter 15

# Designing Attribute Editors

An attribute editor specifies how data is entered for an attribute when that attribute is displayed on a **New** or **Edit** form for a flex asset or a flex parent asset in the Content Server interface on the management system.

When you assign an attribute editor to an attribute, it replaces the default input mechanism (style) that would otherwise be used for that attribute. The default input style is based on the data type of the attribute.

Because attribute editors format the input mechanism for attributes, you design your attribute editors as you design your flex attributes. Attribute editors are assets, which means you can use the workflow and revision tracking features to manage them as you do for any other type of asset.

This chapter contains the following sections:

- Overview
- Creating Attribute Editors
- Customizing Attribute Editors
- Editing Attribute Editors

## Overview

There are three parts to an attribute editor, with an optional fourth:

- The `presentationobject.dtd` file, located in the Content Server installation directory. (Required.) This is the DTD file that defines all the possible input styles (presentation objects) for flex attributes and their style tags.
- The attribute editor asset. (Required.) It holds or points to XML code that provides input options for the attribute it is associated with. You use the style tags defined in the DTD to create this XML code.
- An element that formats the attribute, or, displays an edit mechanism, when that attribute appears in a **New** or **Edit** form. (Required.) This element must be located in the `OpenMarket/Gator/AttributeTypes` directory in the `ElementCatalog` table for CS-Direct Advantage to be able to find it and its name must exactly match the name of the style tag that invokes it from the attribute editor. (See below for more information.)
- An element that formats the attribute value when it appears in an **Inspect** form. (Optional.) This element must also be located in the `OpenMarket/Gator/AttributeTypes` directory in the `ElementCatalog` table.

Its name must use the convention `DisplayStyleTag`, where *StyleTag* represents and must exactly match the name of the style tag that invokes it from the attribute editor.

CS-Direct Advantage provides the following items, by default, to support the development of your attribute editors:

- The `presentationobject.dtd` file. It defines several input styles (presentation objects) that you can use in your attribute editors. This means you do not have to define your own unless the nine that are included do not cover your needs.
- Nine text files with sample XML that you can use to create attribute editor assets. You can cut and paste the sample XML into your attribute editor assets. These files are located in the installation directory under `Samples/Attribute_Editors`.
- Ten display elements that work with the sample XML code for attribute editor assets. They are located in the `OpenMarket/Gator/AttributeTypes` directory in the `ElementCatalog` table.

Remember that attribute editors are not required. When you do not use attribute editors, CS-Direct Advantage uses default input styles for the attributes, based on their data types. For a list of the default styles, see “Default Input Styles for Attributes” on page 181. If the default input styles are sufficient for your attributes, you do not need to create attribute editors.



## The presentationobject.dtd File

The `presentationobject.dtd` file defines all of the input types (presentation objects) that you can implement through attribute editors. The default `presentationobject.dtd` file defines nine input style tags and the arguments that they can pass from the attribute editor to the display elements (described in “The Attribute Editor Elements” on page 330).

Following is the entire `presentationobject.dtd` file. It is located in the Content Server installation directory:

```
<!-- PRESENTATIONOBJECT: An editor
-- PRESENTATIONOBJECT defines the presentation object
-- for instances of Gator attribute types. A presentation object
-- defines the properties of an editor for one of the following
-- controls:
--
-- For additional information, refer to
-- com.openmarket.gator.interfaces.IPresentationObject.
--
-->

<!ELEMENT PRESENTATIONOBJECT (TEXTFIELD | TEXTAREA | PULLDOWN |
RADIOBUTTONS | CHECKBOXES | PICKFROMTREE | EWEBEDITPRO | REMEMBER
| PICKASSET)>

<!ATTLIST PRESENTATIONOBJECT NAME CDATA #REQUIRED>

<!-- TEXTFIELD: A text field of a specific width
-- You must specify the x dimension; the maximum number of
-- allowable characters defaults to 256.
-->
<!ELEMENT TEXTFIELD ANY>
<!ATTLIST TEXTFIELD XSIZE CDATA #REQUIRED>
<!ATTLIST TEXTFIELD MAXCHARS CDATA "256">
<!ATTLIST TEXTFIELD BLANKED (YES | NO) "NO">

<!-- TEXTAREA: A text area of a specific size
-- You must specify the x and y dimensions; the wrap style
-- defaults to soft.
-->
<!ELEMENT TEXTAREA ANY>
<!ATTLIST TEXTAREA XSIZE CDATA #REQUIRED>
<!ATTLIST TEXTAREA YSIZE CDATA #REQUIRED>
<!ATTLIST TEXTAREA WRAPSTYLE (OFF | SOFT | HARD) "SOFT">

<!-- PULLDOWN: A pulldown menu with an enumeration of items
-- You can specify zero or more list items; the fontsize
-- defaults to relative fontsize 3.
-->
<!ELEMENT PULLDOWN ((ITEM)* | QUERYASSETNAME)>
<!ATTLIST PULLDOWN FONTSIZE CDATA "3">

<!-- RADIOBUTTONS: Radio buttons with an enumeration of items
```

```

-- You can specify zero or more list items; the fontsize
-- defaults to relative fontsize 3.
-->
<!ELEMENT RADIOBUTTONS ((ITEM)* | QUERYASSETNAME)>
<!ATTLIST RADIOBUTTONS FONTSIZE CDATA "3">
<!ATTLIST RADIOBUTTONS LAYOUT (HORIZONTAL | VERTICAL)
"HORIZONTAL">

<!-- CHECKBOXES: Check boxes with an enumeration of items
-- You can specify zero or more list items; the fontsize
-- defaults to relative fontsize 3.
-->
<!ELEMENT CHECKBOXES ((ITEM)* | QUERYASSETNAME)>
<!ATTLIST CHECKBOXES FONTSIZE CDATA "3">
<!ATTLIST CHECKBOXES LAYOUT (HORIZONTAL | VERTICAL) "HORIZONTAL">

<!-- ITEM: A list item
-- You can specify zero or more characters of text.
-->
<!ELEMENT ITEM (#PCDATA)*>

<!-- SQL: Query to populate list of items
-- You can specify zero or more characters of text. Query must
-- return a 'value' column.
-->
<!ELEMENT QUERYASSETNAME (#PCDATA)*>

<!-- EWEBEDITPRO: EWebEditPro ActiveX widget
-- You must specify the x and y pixel dimensions-->
<!ELEMENT EWEBEDITPRO ANY>
<!ATTLIST EWEBEDITPRO XSIZE CDATA #REQUIRED>
<!ATTLIST EWEBEDITPRO YSIZE CDATA #REQUIRED>

<!-- PICKFROMTREE: An "add from tree" button. -->
<!ELEMENT PICKFROMTREE ANY>

<!-- REMEMBER: The Content Centre version 3.6 remember widget. -->
<!ELEMENT REMEMBER ANY>

<!-- PICKASSET: When the tree is active, it's the "add from tree"
-- button. When the tree is disabled, it's The Content Centre
-- version 3.6 remember widget. -->
<!ELEMENT PICKASSET ANY>

```

## Conventions for the presentationobject.dtd File

If you want to create custom attribute editors other than the ones made possible by default, you must first define an XML input style tag, a PRESENTATIONOBJECT tag, in the presentationobject.dtd file. To define a new PRESENTATIONOBJECT tag, you must do the following:

- Add the new tag (presentation object) to the list in the `<!ELEMENT PRESENTATIONOBJECT ...>` statement.
- Add a `<!ELEMENT ...>` section that defines the new tag (presentation object) and the arguments that it takes. Follow the normal syntax rules for a .dtd file and follow the conventions used in the presentationobject.dtd file.

## The Attribute Editor Asset

The attribute editor asset either holds XML code or points to an .xml file.

That XML code does one thing: if the input type is one that provides options (check boxes, radio options, pull-down lists, and so on), it provides the values of those options.

Although CS-Direct Advantage provides nine text files with sample code that you can use to create new attribute editor assets, it does not provide any attribute editor assets because you need to customize the sample code so that any options are appropriate for your data.

When you create your attribute editors, you can either cut and paste the code from HTML version of this book (samples follow this section) or you can use the text files located in the Samples subdirectory of the installation directory on your system.

## The Syntax and the Default Tags

The code in an attribute editor asset has the following basic format:

```
<?XML VERSION="1.0"?>
<!DOCTYPE PRESENTATIONOBJECT SYSTEM "presentationobject.dtd">

<PRESENTATIONOBJECT NAME="SomeName">
...
...
...

</PRESENTATIONOBJECT>
```

The tag that describes the format of the input style (presentation object) is embedded between the pair of PRESENTATIONOBJECT tags and it can have additional nested tags in it. Although the NAME attribute is required for the PRESENTATIONOBJECT tag, it is not used yet; it is reserved for future use.

The name of any PRESENTATIONOBJECT tag that you include in the code for an attribute editor asset must be defined in the presentationobject.dtd file. This .dtd file has the following PRESENTATIONOBJECT tags defined by default:

- TEXTFIELD
- TEXTAREA
- PULLDOWN
- RADIOBUTTONS
- CHECKBOXES
- EWEBEDITPRO

- PICKASSET
- REMEMBER
- PICKFROMTREE (deprecated; use PICKASSET instead)

Note that the PRESENTATIONOBJECT tag that you use in the attribute editor code must exactly match the name of the display element that you want to use for the attribute editor. Therefore, if you decide to define a new tag for a custom attribute editor, the element that you create must use the same name as the tag.

For a description of the elements, see “The Attribute Editor Elements” on page 330. For code samples for attribute editors, read on:

## CHECKBOXES Example

The presentationobject.dtd defines a CHECKBOXES tag—an attribute editor that uses the tag invokes the CHECKBOXES element, which creates a set of check boxes for the attribute.

The CHECKBOXES tag takes the following parameters:

- ITEM or QUERYASSETNAME — the source of the names listed next to the check boxes. To specify the names, use the ITEM parameter. To specify a query asset that obtains the names dynamically from a database table, use the QUERYASSET parameter.

Note the following:

- You cannot use a SQL statement — you must use a query asset if you want to use a query.
- The SQL in the query asset must return a “value” column. For example: `select name as value from shippingtype`
- If the data type of the attribute using the attribute editor is “asset”, the query must also return the assets’ IDs. For example: `select name as value, id as assetid from Products where...`
- LAYOUT— whether the check boxes should be positioned in a vertical list or spread out in a horizontal row. Valid options are HORIZONTAL or VERTICAL. The default is HORIZONTAL.

The following attribute editor code specifies that the CHECKBOXES element should use the results of a query asset named A Prods for the names of a vertical list of check boxes:

```
<?XML VERSION="1.0"?>
<!DOCTYPE PRESENTATIONOBJECT SYSTEM "presentationobject.dtd">
<PRESENTATIONOBJECT NAME="CheckBox">
  <CHECKBOXES LAYOUT="VERTICAL">
    <QUERYASSETNAME>A Prods</QUERYASSETNAME>
  </CHECKBOXES>
</PRESENTATIONOBJECT>
```

For example code that shows the use of the ITEM parameter, see “PULLDOWN Example” on page 326.

## Notes About Data Types

A CHECKBOXES attribute editor is appropriate for attributes with the following data types:

- date
- float
- integer
- money
- string
- asset (if asset, you must supply the name of the query asset that returns the names of the assets)

## EWEBEDITPRO Example

The `presentationobject.dtd` defines an EWEBEDITPRO tag. An attribute editor that uses the tag invokes the EWEBEDITPRO element which launches the eWebEditPro HTML editor in a separate window. The person creating the flex asset enters the value for the attribute in that window.

Note the following about creating an eWebEditPro field with an attribute editor:

- You must have the eWebEditPro application installed and configured correctly. It is not delivered with CS-Direct Advantage. You must obtain it from FatWire (contact your FatWire sales representative). For information about configuring eWebEditPro, see the *CSEE Administrator's Guide*.
- It is highly recommended that you use eWebEditPro only when the data type of the attribute is set to `blob`. If you use `blob` as the data type, you do not have to worry about sizing the field.

The EWEBEDITPRO tag takes the following parameters:

- XSIZE—the x axis dimension, in pixels.
- YSIZE—the y axis dimension, in pixels.

The following attribute editor code includes an EWEBEDIT pro tag that creates text box that is 400 pixels wide by 200 pixels high:

```
<?XML VERSION="1.0"?>
<!DOCTYPE PRESENTATIONOBJECT SYSTEM "presentationobject.dtd">

<PRESENTATIONOBJECT NAME="eWebEditProTest">
  <EWEBEDITPRO XSIZE="400" YSIZE="200">
  </EWEBEDITPRO>
</PRESENTATIONOBJECT>
```

## Notes About Data Types

The best choice for the data type of an attribute that uses an EWEBEDITPRO attribute editor is `blob`. You can use `string` or `text` but it is problematic because it is hard to predict how large the data entered into the attribute's field will be because each HTML marker counts as a character. The `string` data type is limited to 256 characters and `text` is limited to 2000.

FatWire recommends that you use `blob` as the data type for attributes that use eWebEditPro as their input mechanism.

## PICKASSET Example

The `presentationobject.dtd` defines a `PICKASSET` tag—an attribute editor that uses the tag invokes the `PICKASSET` element, which formats a field that accepts the value of an asset in one of two ways, depending on whether the tree is toggled on or off.

- If the tree in the Content Server interface is toggled on, the `PICKASSET` element uses the `Pick From Tree` method. That is, you select an asset by clicking on it in one of the tabs on the tree in the left frame of the CS-Direct Advantage window.
- If the tree is toggled off, the `PICKASSET` element uses the `Remember` method, pop-up window that displays all the assets that are currently listed in your Active List and History list.

This tag has no default parameters.

Here is the code to create a `PICKASSET` attribute editor:

```
<?XML VERSION="1.0"?>
<!DOCTYPE PRESENTATIONOBJECT SYSTEM "presentationobject.dtd">

<PRESENTATIONOBJECT NAME="PickAsset">
  <PICKASSET>
  </PICKASSET>
</PRESENTATIONOBJECT>
```

## Notes About Data Types

A `PICKASSET` attribute editor is only appropriate for attributes with a data type of `asset`.

## PULLDOWN Example

The `presentationobject.dtd` defines a `PULLDOWN` tag—an attribute editor that uses the tag invokes the `PULLDOWN` element, which formats a field with a drop-down list of values.

This tag takes the following parameters:

- `ITEM` or `QUERYASSETNAME` — the source of the names in the drop-down list. To specify the names, use the `ITEM` parameter. To specify a query asset that obtains the names dynamically from a database table, use the `QUERYASSET` parameter.

Note the following:

- You cannot use a SQL statement — you must use a query asset if you want to use a query.
- The SQL in the query asset must return a “value” column. For example: `select name as value from shippingtype`
- If the data type of the attribute using the attribute editor is “asset”, the query must also return the assets’ IDs. For example: `select name as value, id as assetid from Products where...`

The following attribute editor code specifies that the list holds the items red, green, and blue:

```
<?XML VERSION="1.0"?>
<!DOCTYPE PRESENTATIONOBJECT SYSTEM "presentationobject.dtd">

<PRESENTATIONOBJECT NAME="PulldownTest">
  <PULLDOWN>
```

```

    <ITEM>Red</ITEM>
    <ITEM>Green</ITEM>
    <ITEM>Blue</ITEM>
</PULLDOWN>

```

For example code that shows how to use the `QUERYASSETNAME` parameter rather than `ITEM`, see “CHECKBOXES Example” on page 324.

## Notes About Data Types

A `PULLDOWN` attribute editor is appropriate for attributes with the following data types:

- date
- float
- integer
- money
- string
- asset

A pull-down list is the default input style for attributes of type `asset`. The list displays all the assets of that type. Use a `PULLDOWN` attribute editor when you want to further restrict the items in the drop-down list with a query asset so that the list doesn’t display every asset of that type.

## RADIOBUTTONS Example

The `presentationobject.dtd` defines a `RADIOBUTTONS` tag—an attribute editor that uses the tag invokes the `RADIOBUTTONS` element, which creates a set of radio options for the attribute.

The `RADIOBUTTONS` tag takes the following parameters:

- `ITEM` or `QUERYASSETNAME` — the source of the names listed next to the radio options. To specify the names, use the `ITEM` parameter. To specify a query asset that obtains the names dynamically from a database table, use the `QUERYASSET` parameter.

Note the following:

- You cannot use a SQL statement—you must use a query asset if you want to use a query.
- The SQL in the query asset must return a “value” column. For example: `select name as value from shippingtype`
- If the data type of the attribute using the attribute editor is “asset”, the query must also return the assets’ IDs. For example: `select name as value, id as assetid from Products where...`
- `LAYOUT`— whether the buttons should be positioned in a vertical list or spread out in a horizontal row. Valid options are `HORIZONTAL` or `VERTICAL`. The default is `HORIZONTAL`.

The following attribute editor code specifies that the `RADIOBUTTONS` element should use the results of a query asset named `A Prods` for the names of a vertical list of buttons:

```

<?XML VERSION="1.0"?>
<!DOCTYPE PRESENTATIONOBJECT SYSTEM "presentationobject.dtd">

<PRESENTATIONOBJECT NAME="RadioButtonTest">

```

```

    <RADIOBUTTONS LAYOUT="VERTICAL">
        <QUERYASSETNAME>A Prods</QUERYASSETNAME>
    </RADIOBUTTONS>
</PRESENTATIONOBJECT>

```

For example code that shows the use of the `ITEM` parameter, see “PULLDOWN Example” on page 326.

### Notes About Data Types

A `RADIONBUTTON` attribute editor is appropriate for attributes with the following data types:

- date
- float
- integer
- money
- string
- asset (if asset, you must supply the name of the query asset that returns the names of the assets)

### TEXTAREA Example

The `presentationobject.dtd` defines a `TEXTAREA` tag— an attribute editor that uses the tag invokes the `TEXTAREA` element, which creates a text box field for the attribute, and a pair of radio buttons that allows users to specify whether or not that attribute should display embedded link buttons.

The `TEXTAREA` tag takes the following parameters:

- `XSIZE` — the x axis dimension, in pixels.
- `YSIZE` — the y axis dimension, in pixels.
- `WRAPSTYLE` — whether the text in the box wraps at all, and, if it does whether it wraps automatically (soft) or only when the user presses the Enter key (a hard return). Valid options are `SOFT`, `HARD`, and `OFF`. The default is `SOFT`.

The following attribute editor code defines the `XSIZE` as 40 pixels, the `YSIZE` as 5 pixels, and disables text wrapping by setting `WRAPSTYLE` to `OFF`:

```

<?XML VERSION="1.0"?>
<!DOCTYPE PRESENTATIONOBJECT SYSTEM "presentationobject.dtd">

<PRESENTATIONOBJECT NAME="TextAreaTest">
    <TEXTAREA XSIZE="40" YSIZE="5" WRAPSTYLE="OFF">
    </TEXTAREA>
</PRESENTATIONOBJECT>

```

### Notes About Data Types

A `TEXTAREA` attribute editor is appropriate for attributes with the data type of `text` and `blob`. Use the `text` data type when you need to store up to 2000 characters. If you need to store more than 2000 characters, use the `blob` data type.



## TEXTFIELD Example

The `presentationobject.dtd` defines a `TEXTFIELD` tag—an attribute editor that uses the tag invokes the `TEXTFIELD` element from the New and Edit forms, which creates a text field for the attribute. When the attribute is displayed on the Inspect form, however, it uses the `DisplayTEXTFIELD` element.

The `TEXTFIELD` tag takes the following parameters:

- `XSIZE` — the length of the field, in characters.
- `MAXCHARS` — the number of characters, up to 256, allowed in the field.
- `BLANKED` — whether the attribute’s value is replaced with a string of asterisks when it is displayed in the **Inspect** form. For example, if you created a “password” attribute, you would not want the value of the password displayed in an **Inspect** form. Valid options are YES and NO. The default is NO.

Because using the `BLANKED` parameter automatically means that you need the field to behave differently on the **New** and **Edit** forms than it does on the **Inspect** form, the `TEXTFIELD` tag is delivered with both of the two possible elements by default.

The following attribute editor code defines the `XSIZE` as 60 and the maximum number of characters as 80:

```
<?XML VERSION="1.0"?>
<!DOCTYPE PRESENTATIONOBJECT SYSTEM "presentationobject.dtd">

<PRESENTATIONOBJECT NAME="TextFieldTest">
  <TEXTFIELD XSIZE="60" MAXCHARS="80">
  </TEXTFIELD>
</PRESENTATIONOBJECT>
```

### Notes About Data Types

A `TEXTFIELD` attribute editor is appropriate for attributes with the following data types:

- float
- integer
- money
- string
- url

## The Attribute Editor Elements

The elements that take the input values passed to them from their attribute editor counterparts supply the logic behind the format and behavior of the attribute when it is displayed on a form. For example, it might perform a loop sequence for multivalue attributes so that additional values can be entered in the field.

Following are the default flex attribute display elements located in the `ElementCatalog` table under `OpenMarket/Gator/AttributeTypes`. The names of these elements match exactly the names of the custom XML tags defined in the `presentationobject.dtd` file:

Element	Description
CHECKBOXES	Formats the input style of the attribute as a set of check box options. The attribute editor must either define the names of the options or provide the name of a query asset to use to obtain the names.
EWEBEDITPRO	Invokes the WebEditPro HTML editor, a third-party product available from Ektron, Inc. The attribute editor must specify the x and y pixel dimensions.
PULLDOWN	Formats the input style of the attribute as a select field with a drop-down list. The attribute editor must either specify the items that are displayed in the list or provide the name of a query asset to use to obtain the values.
RADIOBUTTONS	Formats the input style of the attribute as a set of radio options. The attribute editor must define the names of the options or provide the name of a query asset to use to obtain the names.
TEXTAREA	Formats the input style of the attribute as a text box and displays radio buttons that allow the user to specify whether or not the text box will allow embedded links. The attribute editor must define the x and y dimensions of the box.
TEXTFIELD	Formats the input style of the attribute as a text field. The attribute editor must define the length of the field and the number of characters that are allowed in the field.
DisplayTEXTFIELD	Formats the appearance of the text field attribute's value when it is displayed on the <b>Inspect</b> form. If the attribute editor sets the <code>BLANKED</code> parameter to <code>YES</code> , this element displays the value from the field as a string of asterisks. Typically used for password fields.

Element	Description
PICKASSET	<p>Formats the input style of the attribute to change based on whether the tree is toggled off or on:</p> <ul style="list-style-type: none"> <li>• When the tree is displayed, the attribute uses the “pick from tree” mechanism.</li> <li>• When the tree is not displayed, the attribute uses the “remember” mechanism.</li> </ul>
PICKFROMTREE	Deprecated. Use PICKASSET.
REMEMBER	<p>Formats the input style of the attribute as a popup window that displays all the assets that are currently on the user’s Active List and History tabs.</p>

## Conventions for the Attribute Editor Elements

In order for CS-Direct Advantage to use an element for an attribute editor, that element must conform to the following rules:

- It must have the same name as the input style tag that calls it from the attribute editor code. For example, the default CHECKBOXES tag has a default CHECKBOXES.xml element.
- The element must be placed in the ElementCatalog using the following naming conventions: OpenMarket/Gator/AttributeTypes/*name*

If you want to create your own display elements to use with custom attribute editors, it is best to find one that is the closest to the attribute editor element that you want to create and then copy as much of it as possible.

For help, examine the code in the default attribute editor elements and read the following descriptions of the variables and syntax in them.

### Variables

When CS-Direct Advantage loads a form that uses the attribute editor, it calls the element with the machine name. It passes the information in the following variables to the display element:

- `PresInst`—the instance of the current presentation object
- `AttrName`—the name of the current attribute
- `AttrType`—the data type of the current attribute
- `EditingStyle`—whether the attribute can take more than one value (based on the value in the **Number of Values** field for the attribute). This variable is set to either `single` or `multiple`.
- `RequiredAttr`—whether or not the attribute is required for the current asset. The variable is set to either `true` or `false`.
- `MultiValueEntry`—instructs CS-Direct Advantage how to handle the values for an attribute that can take more than one value.

When this value is set to `yes`, the display element is called once, under the assumption that the widget created by the element enables the user to select more than one value in it (a multi-select drop-down list, for example).

When this value is set to `no`, CS-Direct Advantage calls the display element once for each possible value for the attribute and displays one widget for each value that can be stored.

Note that this value is always set to `yes` initially.

- `doDefaultDisplay`—whether to use the default input style for an attribute of this type. (For a list, see “Default Input Styles for Attributes” on page 181.) When CS-Direct Advantage calls the display element, this variable is initially set to `yes`. To use the input widget created by the element, the element must reset this variable to `no`.
- `AttrValueList`—the list of all the values for this attribute.
- `TempVal`—the value of a single attribute value.

### Other Required Syntax

The code in the display element must also use the following conventions:

- It must store information about how to validate the attribute values in a variable named `RequireInfo`. CS-Direct Advantage passes this variable elements use JavaScript to validate the attribute values. Those elements are:

```
OpenMarket/Gator/FlexibleAssets/FlexAssets/ContentForm1
OpenMarket/Gator/FlexibleAssets/FlexGroups/ContentForm1
```

This JavaScript performs prescribed error checking and validation based on the type of control, the data type, and other predictable characteristics. The information passed in the `RequireInfo` variable informs the JavaScript about the custom requirements for the attribute editor.

- The name of the widget in the display element (the `INPUT NAME`) must use the following convention:
  - For a single-value attribute, the name of the attribute.
  - For a multi-value attribute, it must use a 1-based counter prepend the attribute name for each attribute value (for example, `1color`, `2color`, `3color`).

For an example, see “Customizing Attribute Editors” on page 335.

## Creating Attribute Editors

To create an attribute editor using the sample XML code provided in this chapter or in the sample text files, complete the following steps

1. Open your browser and enter this address:  
`http://your_server/Xcelerate/LoginPage.html`
2. Enter your login name and password and click **Login**.
3. Click **New** and select **Attribute Editor** from the shortcut list

The **New Attribute Editor** form appears:

Attribute Editor:

Cancel Save

\*Name:

Description:

XML in file:  Browse...

XML:

Cancel Save

4. Click in the **Name** field and enter a unique name of up to 64 characters, excluding spaces.
5. Click in the **Description** field and enter a short phrase that describes the purpose of the attribute editor.
6. Click in the **XML** field. Either cut and paste the appropriate sample XML attribute editor code from the HTML version of this guide or from the sample text files provided in the `Samples` subdirectory of the installation directory.
7. Edit the code as needed. For example, if you are creating a `CHECKBOXES` or a `RADIOBUTTONS` attribute editor, you must provide names for the check boxes or radio buttons. If you are creating a `PULLDOWN` attribute editor, you must provide the values for the drop-down list.

See “The Attribute Editor Asset” on page 323 for more information about coding the attribute editor.

8. Click **Save**.

**Note**

Another option is to code the XML for the attribute editor in a separate.xml file. In this case, rather than enter the code directly into the XML field, click the **Browse** button next to the XML in file field and select the file.

9. Before this attribute editor can be published to the management system, you must Approve it. For information about approving assets, see the *CSEE User's Guide*.

**Note**

If you are using a query asset with this attribute editor, be sure to approve both the attribute editor and the query asset.

Because the dependency between an attribute editor and its query asset is specified in the XML code in the attribute editor, the approval system can not detect the dependency and verify that the query asset exists on the management system.

## Customizing Attribute Editors

If you need to create your own custom attribute editor, the best thing to do is to copy as much as you can from the sample attribute editor code and the sample display elements.

If you determine that you must create a new input style (you cannot use any of the default PRESENTATIONOBJECT tags), you must add a new PRESENTATIONOBJECT section that to the presentationobject.dtd file that defines the attribute editor. For information about adding to this file, see “The presentationobject.dtd File” on page 321.

When you create a custom PRESENTATIONOBJECT tag, you must also supply the appropriate display elements for it:

- Required: An element that formats the attribute (displays an edit mechanism) when that attribute appears in a **New** or **Edit** form.
- Optional: An element that formats the attribute when it appears in the **Inspect** form.

For information about the variables and conventions used in the display elements for an attribute editor, see “The Attribute Editor Elements” on page 330.

### Example: Customized Attribute Editor

This example demonstrates how you could customize the description of the TEXTAREA tag in the presentationobject.dtd file and the TEXTAREA element to create an attribute editor that disables a text box if the user does not have the proper permissions.

There are three steps:

1. Editing the description of the TEXTAREA tag in the presentationobject.dtd to support a new parameter named PERMISSIONS.
2. Writing the code for the attribute editor and creating the attribute editor.
3. Editing the TEXTAREA element to check the value of PERMISSIONS.

#### Step 1: Editing the presentationobject.dtd file

To support the new parameter, you add a single line of code to the TEXTAREA description in the presentationobject.dtd:

```

1  <!-- TEXTAREA: A text area of a specific size. You must
    specify
2  -- the x and y dimensions; the wrap style defaults to soft.
3  -->
4  <!ELEMENT TEXTAREA ANY>
5  <!ATTLIST TEXTAREA XSIZE CDATA #REQUIRED>
6  <!ATTLIST TEXTAREA YSIZE CDATA #REQUIRED>
7  <!ATTLIST TEXTAREA WRAPSTYLE (OFF | SOFT | HARD) "SOFT">
8  <!ATTLIST TEXTAREA PERMISSION CDATA>
```

The new line of code is line 8. Lines 1 through 7 are the default description of the TEXTAREA tag.

## Step 2: Example Code for the Example Attribute Editor

Here's the example code with the new parameter. It specifies that a user must have "Administrators" as the value for PERMISSION in order to see the field:

```
<?XML VERSION="1.0"?>
<!DOCTYPE PRESENTATIONOBJECT SYSTEM "presentationobject.dtd">

<PRESENTATIONOBJECT NAME="TextAreaTest">
  <TEXTAREA XSIZE="40" YSIZE="10" WRAPSTYLE="SOFT"
    PERMISSION="Administrators">
  </TEXTAREA>
</PRESENTATIONOBJECT>
```

## Step 3: Editing the TEXTAREA Element

The third step is editing the TEXTAREA element. Lines 56 through 70 are the new code that enables or disables the field, based on the value of the PERMISSION parameter:

```
1  <?XML VERSION="1.0" ?>
2  <!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
3  <FTCS Version="1.1">
4  <!-- OpenMarket/Gator/AttributeTypes/TEXTAREA
5  --
6  -- INPUT
7  --
8  -- OUTPUT
9  --
10 -->
11
12 <!-- Display one TEXTAREA per attribute value -->
13 <IF COND="Variables.MultiValueEntry=no">
14 <THEN>
15
16 <!-- Don't want default display field -->
17 <setvar NAME="doDefaultDisplay" VALUE="no"/>
18
19 <!-- Get all parameters from Attribute Editor xml -->
20 <presentation.getprimaryattributevalue
21 NAME="Variables.PresInst"
22 ATTRIBUTE="FONTSIZE" VARNAME="FONTSIZE"/>
23   <if COND="Variables.errno!=0">
24 <then>
25 <setvar NAME="FONTSIZE" VALUE="2"/>
26 </then>
27 </if>
28
29 <presentation.getprimaryattributevalue
30 NAME="Variables.PresInst"
31 ATTRIBUTE="WRAPSTYLE" VARNAME="WRAPSTYLE"/>
32 <if COND="IsVariable.WRAPSTYLE!=true">
33 <then>
34 <setvar NAME="WRAPSTYLE" VALUE="OFF"/>
35 </then>
```



```

36 </if>
37
38 <presentation.getprimaryattributevalue
39 NAME="Variables.PresInst"
40 ATTRIBUTE="XSIZE" VARNAME="XSIZE"/>
41 <if COND="IsVariable.XSIZE!=true">
42 <then>
43 <setvar NAME="XSIZE" VALUE="24"/>
44 </then>
45 </if>
46
47 <presentation.getprimaryattributevalue
48 NAME="Variables.PresInst"
49 ATTRIBUTE="Ysize" VARNAME="Ysize"/>
50 <if COND="IsVariable.Ysize!=true">
51 <then>
52 <setvar NAME="Ysize" VALUE="20"/>
53 </then>
54 </if>
55
56 <setvar NAME="disableTextArea" VALUE="no"/>
57 <presentation.getprimaryattributevalue
58 NAME="Variables.PresInst"
59 ATTRIBUTE="PERMISSION" VARNAME="PERMISSION"/>
60 <if COND="IsVariable.PERMISSION=true">
61 <then>
62 <setvar NAME="errno" VALUE="0"/>
63 <USERISMEMBER GROUP="Variables.PERMISSION"/>
64 <IF COND="Variables.errno=0">
65 <THEN>
66 <setvar NAME="disableTextArea" VALUE="yes"/>
67 </THEN>
68 </IF>
69 </then>
70 </if>
71
72 <tr>
73
74 <!-- Standard element to display attribute name or
75 description
76 -->
77 <callelement NAME="OpenMarket/Gator/FlexibleAssets/Common
78 /DisplayAttributeName"/>
79 <td></td>
80
81 <!-- Single valued attributes -->
82 <if COND="Variables.EditingStyle=single">
83 <then>
84
85 <!-- Special case: TEXTAREA for URL attributes -->
86 <IF COND="Variables.AttrType=url">

```

```

87 <THEN>
88 <setvar NAME="errno" VALUE="0"/>
89 <BEGINS STR="AttrValueList.urlvalue"
90 WHAT="AttrValueList."/>
91 <IF COND="Variables.errno=1">
92 <THEN>
93 <setvar NAME="filename" VALUE="CS.UniqueID.txt"/>
94 </THEN>
95 <ELSE>
96 <setvar NAME="filename"
97 VALUE="AttrValueList.urlvalue"/>
98 </ELSE>
99 </IF>
100
101 <INPUT TYPE="hidden" NAME="Variables.AttrName_file"
102 VALUE="Variables.filename"
103 REPLACEALL="Variables.AttrName,Variables.filename"/>
104
105 <setvar NAME="errno" VALUE="0"/>
106 <BEGINS STR="AttrValueList.@urlvalue"
107 WHAT="AttrValueList."/>
108 <IF COND="Variables.errno=1">
109 <THEN>
110 <setvar NAME="MyAttrVal" VALUE="Variables.empty"/>
111 </THEN>
112 <ELSE>
113 <setvar NAME="MyAttrVal"
114 VALUE="AttrValueList.@urlvalue"/>
115 </ELSE>
116 </IF>
117 </THEN>
118 </IF>
119
120 <!-- Display a TEXTAREA with all parameters from Attribute
121 --Editor xml -->
122 <!-- The NAME of the input must be the attribute name -->
123 <IF COND="Variables.disableTextArea=yes">
124 <THEN>
125 <TEXTAREA DISABLED="yes" NAME="Variables.AttrName"
126 ROWS="Variables.YSIZE" COLS="Variables.XSIZE"
127 WRAP="Variables.WRAPSTYLE"
128 REPLACEALL="Variables.AttrName,Variables.XSIZE,
129 Variables.YSIZE,Variables.WRAPSTYLE,Variables.empty">
130
131 <!-- For most single valued attrs, the value is contained
    in
132 MyAttrVal -->
133 <csvar NAME="Variables.MyAttrVal"/>
134 </TEXTAREA>
135 </THEN>
136 <ELSE>
137 <TEXTAREA NAME="Variables.AttrName"

```

```

138 ROWS="Variables.YSIZE" COLS="Variables.XSIZE"
139 WRAP="Variables.WRAPSTYLE"
140 REPLACEALL="Variables.AttrName,Variables.XSIZE,
141 Variables.YSIZE,Variables.WRAPSTYLE,Variables.empty">
142 <!-- For most single valued attrs, the value is
143 contained in MyAttrVal -->
144 <csvar NAME="Variables.MyAttrVal"/>
145 </TEXTAREA>
146 </ELSE>
147 </IF>
148 </then>
149 <else>
150 <!-- Multiple valued attributes -->
151 <!-- For single value attributes we can usually use the
152 default RequireInfo -->
153 <!-- For multiple value attributes we need to append to
154 RequireInfo for each value -->
155 <if COND="Variables.RequiredAttr=true">
156 <then>
157 <setvar NAME="RequireInfo"
158 VALUE="Variables.RequireInfo*Counters.TCounterVariables.
159 AttrName*ReqTrue*Variables.AttrType!"/>
160 </then>
161 <else>
162 <setvar NAME="RequireInfo"
163 VALUE="Variables.RequireInfo*Counters.TCounterVariables
164 .AttrName*ReqFalse*Variables.AttrType!"/>
165 </else>
166 </if>
167
168 <!-- Display a TEXTAREA with all parameters from Attribute
169 Editor xml -->
170 <!-- The NAME of the input must be the attribute name
171 prepended by the TCounter counter -->
172 <IF COND="Variables.disableTextArea=yes">
173 <THEN>
174 <TEXTAREA NAME="Counters.TCounterVariables.AttrName"
175 ROWS="Variables.YSIZE" COLS="Variables.XSIZE"
176 WRAP="Variables.WRAPSTYLE"
177 REPLACEALL="Counters.TCounter,
178 Variables.AttrName,Variables.XSIZE,
179 Variables.YSIZE,Variables.WRAPSTYLE">
180 <csvar NAME="Variables.tempval"/> </TEXTAREA>
181 </THEN>
182 <ELSE>
183 <TEXTAREA NAME="Counters.TCounterVariables.AttrName"
184 ROWS="Variables.YSIZE" COLS="Variables.XSIZE"
185 WRAP="Variables.WRAPSTYLE"
186 REPLACEALL="Counters.TCounter,
187 Variables.AttrName,Variables.XSIZE,
188 Variables.YSIZE,Variables.WRAPSTYLE">
189 <csvar NAME="Variables.tempval"/> </TEXTAREA>

```

```
190 </ELSE>
191 </IF>
192 </else>
193 </if>
194 </td>
195 </tr>
196 </THEN>
197 </IF> <!-- MultiValueEntry -->
198 </FTCS>
```

## Editing Attribute Editors

Note the following when editing an attribute editor:

- You can change the **Name** without causing a schema change.
- You can change the **Description** without causing data loss.
- If you change code in the attribute editor:
  - You can add input options.
  - If you have existing data, you should not remove input options. If you do, some of your existing data will no longer be valid and you will have to search through the database and fix it.
  - If you change the input style, you risk a data mismatch.

## Chapter 16

# Importing Assets

After you have determined your data design, created your asset types, tested them on your development system, and moved them to your management system, the next step is to put your assets (content) into the database on your management system. If you are using a wire feed service or have some other source of remotely generated content, it is likely that you will want to import that data into the Content Server database on your management system.

To import any data into the Content Server database, you can use the XMLPost utility. This utility is based on the Content Server FormPoster Java class and it is delivered with the Content Server base product. It imports data using the HTTP POST protocol.

This chapter describes the general process of importing assets with the XMLPost utility. You use the information in this chapter for importing assets of all types. The next chapter, Chapter 17, “Importing Flex Assets,” provides additional information that you need to import your assets when you are using the flex asset data model.

This chapter contains the following sections:

- The XMLPost Utility
- XMLPost Configuration Files
- XMLPost Source Files
- Using the XMLPost Utility
- Customizing RemoteContentPost and PreUpdate
- Troubleshooting XMLPost

## The XMLPost Utility

To import assets, you instruct the XMLPost utility to invoke one of the importing (posting) elements provided by CS-Direct or CS-Direct Advantage, as appropriate for that asset type.

There are four components involved in this process:

- The **XMLPost** utility, which is delivered with Content Server.
- A **posting element**. CS-Direct delivers a posting element named `RemoteContentPost`. CS-Direct Advantage delivers three additional posting elements, described in Chapter 17, “Importing Flex Assets.”
- A **configuration file** with an `.ini` file extension. You create a configuration file for each asset type that you plan to import. This file contains information about what to expect in the source files (what tags XMLPost will find there), what to do with the data provided, and which importing (posting) element to use to import the data.
- **Source files**. You provide an individual source file for each asset that you want to import (well-formed XML files). Each tag in a file identifies a field for that asset type. The information contained in the tag is the data to be written to that column.

The XMLPost utility parses the configuration file to determine how to interpret the data provided for the asset type, parses the source files and creates name/value pairs for each field value, and passes those name/value pairs as ICS variables to the `RemoteContentPost` element. The `RemoteContentPost` element then creates the asset from the variables.

You can also create your own posting elements that work with the XMLPost utility. However, for importing assets, the posting elements that are provided by CS-Direct and CS-Direct Advantage should meet your needs.

## Overview

This section provides a brief overview of the steps that the developer completes before invoking the XMLPost utility and what the XMLPost utility does.

### What the Developer Does

When you import assets into your Content Server database, you perform four general steps:

1. You create a configuration file that identifies the type of asset that is to be imported and the tags that are used in the source files.

This file also sets several configuration properties, including the name of the SiteCatalog entry for the posting element that you want XMLPost to use. For all assets other than the flex member of a flex family, the name of this posting element is `RemoteContentPost`. For information about the posting elements for flex assets, see Chapter 17, “Importing Flex Assets.”

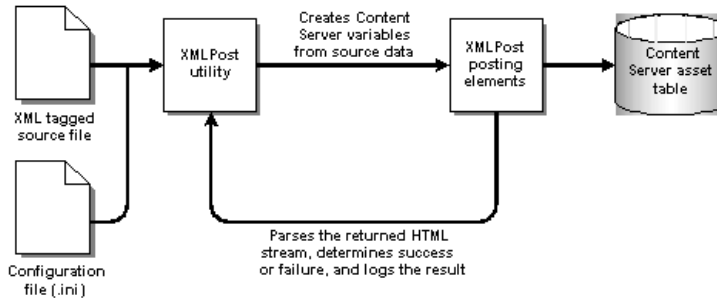
Note that the configuration file is specific for this asset type. You must provide a separate configuration file for each asset type.

2. You create the source files for the data that you want to import. Note that you create a separate source file for each individual asset.
3. You place the source and configuration files in a directory on the management system.

4. From that directory, you invoke the XMLPost utility, identifying the source files and the configuration file to use for those source files.

## What XMLPost and Content Server Do

After you invoke the XMLPost utility to import the source files, this is what happens next, as shown in the following diagram and list of steps:



1. The XMLPost utility parses the configuration file.
2. XMLPost parses the source file and creates name/value pairs for each field value specified in the source file.
3. XMLPost invokes the `FormPoster` Java class by posting (HTTP POST) the name/value pairs as ICS variables to the page name passed in from the configuration file. When you are importing basic asset types, that pagename is:  
`OpenMarket/Xcelerate/Actions/RemoteContentPost`
4. Content Server locates the page in the `SiteCatalog` table and invokes the root element of the `RemoteContentPost` page, which has the same name (`RemoteContentPost`).
5. The `RemoteContentPost` element passes the data from the source files as variables to the `PreUpdate` element for assets of that type.
6. The `PreUpdate` element for assets of that type sets the variable values for that asset and then returns to the `RemoteContentPost` element.
7. The `RemoteContentPost` element creates the asset.
8. The web server returns a stream of HTML to XMLPost, which then parses the stream to determine whether the import operation succeeded or failed, logging the results to a text file that you specify in the configuration file.
9. If the asset type of the asset that you are importing use a search engine, `RemoteContentPost` indexes the new element.
10. If you set a certain parameter in the configuration file, `RemoteContentPost` deletes the source files for the assets that were successfully imported.

## XMLPost Configuration Files

There are three types of properties in a configuration file for XMLPost:

- Properties that provide information to XMLPost about the database and environment. These properties remain the same even if you create your own posting element.
- Properties that provide configuration values for the posting (importing) process. This chapter describes the properties that you must provide for the `RemoteContentPost` element to function correctly.

Examples of properties include the URL of the page that invokes `RemoteContentPost`, a user name and password that gives XMLPost write privileges to the asset type table in the database, the name of the asset type that you want to import, how to log errors, and any data values that are the same for all of the assets that you are importing.

- Properties that specify the tags that are used in the source files.

Certain information, such as which site the assets should belong to or which workflow should be assigned to the asset, can be configured either in the `RemoteContentPost` section of the configuration file or the source file section.

For example, if you have only one CSEE site or if all of the assets that you are importing belong to the same site, specify the ID of the site in the configuration section so you do not have to repeat that information in each source file. If your system has more than one CSEE site, specify which sites an asset belongs to in the individual source files.

### Configuration Properties for XMLPost

The following table lists the properties that specify database connection information and other general configuration instructions that the XMLPost utility needs:

Property	Description
<code>xmlpost.xmlfilenamefilter</code>	<p>Required.</p> <p>The file extension for your source files. Typically set to <code>xml</code>.</p> <p>For example:</p> <pre>xmlpost.xmlfilenamefilter: .xml</pre>
<code>xmlpost.proxyhost</code>	<p>Optional.</p> <p>If a firewall separates you and the Content Server database that you want to import the assets in to, use this property to specify the host name of the proxy server.</p> <p>For example:</p> <pre>xmlpost.proxyhost: nameOfServer</pre>



Property	Description
<code>xmlpost.proxyport</code>	<p>Optional.</p> <p>If a firewall separates you and the Content Server database that you want to import the assets in to, use this property to specify the port number on the proxy server that XMLPost should connect to.</p> <p>For example:</p> <pre>xmlpost.proxyport: 80</pre>
<code>xmlpost.url</code>	<p>Required.</p> <p>The first part of the URL for the page entry of the posting element.</p> <p>XMLPost creates the URL for the posting element by prepending the value specified for this property to the value specified for the <code>pagename</code> <code>postargname</code> (described below).</p> <p>The value that you set for this property should use the following convention:</p> <ul style="list-style-type: none"> <li>• The name of the server that holds the Content Server database.</li> <li>• The CGI path appropriate for the application server software installed on the server. For example, for WebLogic, WebSphere, and Sun ONE this path is <code>/servlet/</code> and for iPlanet, this path is <code>/NASapp/cs/</code>.</li> <li>• The name of the ContentServer servlet.</li> </ul> <p>For example:</p> <pre>xmlpost.url: http://servername/ servlet/ContentServer</pre> <p>or</p> <pre>xmlpost.url: http://servername/ NASapp/cs/ContentServer</pre>
<code>xmlpost.logfile</code>	<p>Optional.</p> <p>The name of the file to log the results of importing (posting) each source file.</p> <p>Each source file is posted to the Content Server database through a post request. When the post request returns from the web server, XMLPost parses the HTML stream that the web server returned, searching for the <code>postsuccess</code> and <code>postfailure</code> parameters. XMLPost then writes the result to the file that you name identify with this parameter.</p> <p>For example:</p> <pre>xmlpost.logfile: ArticlePost.txt</pre>

Property	Description
<code>xmlpost.success</code>	<p>Optional.</p> <p>The string to write to the log file when an asset is successfully imported.</p> <p>For example:</p> <pre>xmlpost.success: Woo hoo!</pre>
<code>xmlpost.failure</code>	<p>Optional.</p> <p>The string to write to the log file when an asset is not successfully imported.</p> <p>For example:</p> <pre>xmlpost.failure: Doh!</pre>
<code>xmlpost.deletefile</code>	<p>Optional.</p> <p>Whether to delete the source files after they have been successfully imported into the Content Server database. Valid settings are <code>y</code> (yes) or <code>n</code> (no). By default, the source files are not deleted.</p> <p>For example:</p> <pre>xmlpost.deletefile: y</pre>
<code>xmlpost.timeout</code>	<p>The number of seconds to wait for the http connection to be established. A value of 0 means wait indefinitely.</p> <p>A timeout error is reported if the connection is not made within the number of seconds specified in the property.</p> <p>For example:</p> <pre>xmlpost.timeout: 60</pre>

## Configuration Properties for the Posting Element

The following table lists the arguments that specify information that must be posted to the `RemoteContentPost` page (and passed to the `RemoteContentPost` element). The values of these arguments are concatenated into the URL that is posted to the `RemoteContentPost` page; they can be in any order in the configuration file:

Property	Description
<code>xmlpost.numargs</code>	<p>Required.</p> <p>There are several required variables that the configuration file passes to <code>XMLPost</code> as name/value pairs attached to the URL, the primary of which is the page name. Use this property (<code>xmlpost.numargs</code>) to tell <code>XMLPost</code> how many variables the configuration file is passing in.</p> <p>For example:</p> <pre>xmlpost.numargs: 7</pre> <p>Note that you can also specify your own custom variables with these name/value pairs.</p>
<code>xmlpost.argname1: pagename</code>	<p>Required.</p> <p>The pagename for the <code>RemoteContentPost</code> element. Typically the pagename argument is specified as <code>xmlpost.argname1</code>.</p> <p>For example:</p> <pre>xmlpost.argname1: pagename xmlpost.argvalue1: OpenMarket/ Xcelerate/Actions/RemoteContentPost</pre>
<code>xmlpost.argname2: AssetType</code>	<p>Required.</p> <p>The asset type of the assets that are defined in the source files. Typically, <code>AssetType</code> is specified as <code>xmlpost.argname2</code>.</p> <p>For example:</p> <pre>xmlpost.argname2: AssetType xmlpost.argvalue2: Collection</pre> <p>Note that the value for the <code>AssetType</code> argument must exactly match the table name of the table that holds assets of this type.</p>

Property	Description
xmlpost.argname3: authusername	<p>Required.</p> <p>The user name that you want XMLPost to use to log into the Content Server database that you are importing the assets into. Typically, authusername is specified as xmlpost.argname3.</p> <p>For example:</p> <pre>xmlpost.argname3: authusername xmlpost.argvalue3: editor</pre> <p>The user name that you specify must have permission to write to the table that holds assets of the type that you are importing. (That is, it must have the appropriate ACLs assigned to it.)</p>
xmlpost.argname4: authpassword	<p>Required.</p> <p>The password for the user that XMLPost logs in as to the Content Server database that you are importing the assets into. Typically, authpassword is specified as xmlpost.argname4.</p> <p>For example:</p> <pre>xmlpost.argname4: authpassword xmlpost.argvalue4: xceleeditor</pre>
xmlpost.argname5: xmlpostdebug	<p>Optional</p> <p>Whether or not to include debugging information with the results information that is written to the XMLPost log file identified with the xmlpost.logfile property.</p> <p>You can set this property to any value. For example:</p> <pre>xmlpost.argname5: xmlpostdebug xmlpost.argvalue5: on</pre> <p><b>Note:</b> Be sure to include a value for the xmlpost.logfile property if you enable debugging.</p>
xmlpost.argname6: inifile	<p>Optional.</p> <p>The name of the ini file to use when connecting to the Content Server database. Typically, inifile is specified as xmlpost.argname5.</p> <p>For example:</p> <pre>xmlpost.argname6: inifile xmlpost.argvalue6: futuretense.ini</pre>

Property	Description
<code>xmlpost.argmax7: publication</code>	<p>Optional.</p> <p>Although using this property is optional, you must specify a site for each asset that you are importing.</p> <p>If your system uses one CSEE site (publication) or if all assets of this type should be enabled on the same site, use this argument to set the name of the site.</p> <p>For example:</p> <pre>xmlpost.argmax7: publication xmlpost.argvalue7: Burlington Financial</pre> <p>If your system uses more than one CSEE site, you must specify the value for site for each asset in the individual source files. See “Configuration Properties for the Source Files” on page 350 for more information.</p>
<code>xmlpost.argmax8: startmenu</code>	<p>Optional.</p> <p>If you are using workflow and you want the same workflow assigned to all of the assets that you are importing, use this argument to set the Start Menu shortcut for the assets. (It is a Start Menu shortcut that assigns a workflow ID to a new asset.)</p> <p>For example:</p> <pre>xmlpost.argmax8: startmenu xmlpost.argvalue8: New Article</pre> <p>If you have more than one workflow for assets of this type, you must specify the value for the Start Menu shortcut for each asset in the individual source files. See “Configuration Properties for the Source Files” on page 350 for more information.</p>

## Property Names and Previous Versions of XMLPost

The property names for the XMLPost configuration section of the configuration file changed for version 3.6, although the values that the properties specify are the same.

The old property names still work which means that old configuration files still work, but you can run into problems if you have a field named simply “url” when you are using the old property names.

Be sure to use the current property names for any new configuration files.

### Note

You **cannot** mix pre-3.6 property names with post-3.6 property names in the same configuration file.

The following table presents both versions of the property names:

Property names before version 3.6	Property names for 3.6 and subsequent releases
xmlfilenamefilter	xmlpost.xmlfilenamefilter
proxyhost	xmlpost.proxyhost
proxyport	xmlpost.proxyport
posturl	xmlpost.url
postnumargs	xmlpost.numargs
postargname <i>N</i>	xmlpost.argname <i>N</i>
postargvalue <i>N</i>	xmlpost.argvalue <i>N</i>
postsuccess	xmlpost.success
postfailure	xmlpost.failure
postlogfile	xmlpost.logfile
postdeletefile	xmlpost.deletefile

## Configuration Properties for the Source Files

The source file section in a configuration file specifies which tags are used in the source files.

A tag represents a column name in the table that holds assets of this type. The content between a pair of tags is the information that is to be written to that column. Configuration files must list a tag for each column in the asset type's primary storage table, which is why you must provide a separate configuration file for each asset type.

## Site Properties

In addition to the tags that pertain to your asset types, there are four tags that you can use with all asset types to specify certain site configuration properties, that is, which sites an asset should be associated with and which workflow it should use. This table lists the site tags:

Site tag property	Value	Description
postpublication	y or n (yes or no)	Optional. Specifies that a source file will provide a site name that identifies which site the asset belongs to. For example: postpublication: y Note that a site (publication) value provided in a source file with the <code>publication</code> tag overrides the value specified for a publication argument in the XMLPost section of the configuration file.
postprimarypubid	y or n (yes or no)	Optional. Specifies that a source file will provide a value for pubid (a unique ID for the site) that identifies which site the asset belongs to. For example: postprimarypubid: y
postpublist	y or n (yes or no)	Optional. Specifies that a source file will provide a list of sites that the asset is shared with. For example: postpublist: y
poststartmenu	y or n (yes or no)	Optional. Specifies that a source file will provide a value for the Start Menu short cut that places the asset into a workflow process. For example: poststartmenu: y

Remember that if the site or the workflow is the same for all of the assets that you are importing, you can specify the value for site or workflow as an argument in the XMLPost section of the configuration file. That way, you do not have to duplicate the same information in all of the source files.

## Asset Type Properties

To set up the tags that are specific to your asset types, you specify a tag for each column in the database table for assets of that type. However, the source files are not required to include data tagged with every tag in the configuration file. (Of course, they must include data for required fields.)

For each tag representing a field (column), you specify the name of the tag and optionally some additional processing properties for the tag. The name of the tag is the name of the

field (column). For the additional properties, the convention is a word prepended to the name of the tag.

The following table describes how to specify the tags that are specific to your asset types:

Tag property	Value	Description
<code>posttagname</code>	y or n (yes or no)	Required. Specifies the name of the tag. The name should exactly match the name of the field that it represents. For example, the tag property for a <b>name</b> field is: <code>postname: y</code>
<code>truncername</code>	<i>N</i> (integer)	Optional. Whether to truncate the data in the source file marked by this tag. For example: <code>truncername: 64</code> By setting this property for the tag, if XMLPost finds a string in the <code>&lt;name&gt;</code> tag that exceeds 64 characters, it shortens it to 64 characters and stores the truncated string in the variable.
<code>notrimername</code>	y or n (yes or no)	Optional. Whether to trim the white space at the beginning or end of the marked with the tag. If you do not want the white space trimmed, set this property to <code>y</code> (yes). For example: <code>notrimername: y</code> If you do not specify this property, XMLPost trims the white space for the tag by default.



Tag property	Value	Description
<i>multitagname</i>	<i>combine</i> or <i>separate</i>	<p>Required if the same tag is used more than once in a single source file.</p> <p>Determines how many variables to use for the data when a tag is used more than once in the source file. If you set it to <i>combine</i>, the data from all of the tags is stored in the same variable with commas separating each value (a comma delimited string).</p> <p>If you set it to <i>separate</i>, the data from each tag is stored in a separate variable. Those variables are identified by appending the value that you set for <i>seedtagname</i> to the variable name.</p> <p>For example, for a keyword field (column):</p> <ul style="list-style-type: none"> <li>• If you set <i>multikeyword: combine</i>, XMLPost stores all the values marked by a keyword tag to the same keyword variable.</li> <li>• If you set <i>multikeyword: separate</i> and <i>seedkeyword: 1</i>, XMLPost stores each value in a separate variable. The first value it finds is stored in a variable named <i>keyword1</i>. The second value is stored in a variable named <i>keyword2</i>, and so on.</li> </ul>
<i>seedtagname</i>	<i>seed value</i>	<p>Required when <i>multitagname</i> is set to <i>separate</i>.</p> <p>The number to start at when XMLPost increments the suffix assigned to variable names when a tag is used more than once and you do not want the data contained in those tags written to the same variable. See the description of <i>multitagname</i>.</p> <p>For example:</p> <pre>multikeyword: separate seedkeyword: 1</pre>

Tag property	Value	Description
<code>filetagname</code>	y or n (yes or no)	<p>Required if the tag represents an upload field (a URL column).</p> <p>If the tag represents a field that has a URL column, you must include this property and the source file must specify the name of the file that <code>RemoteContentPost</code> is to upload to that column.</p> <p>For example, the <code>imagefile</code> asset type from the Burlington Financial sample site has an upload field named <code>urlpicture</code>. A configuration file for the <code>imagefile</code> asset type would have the following properties:</p> <pre>posturlpicture: y fileurlpicture: y</pre> <p>Then, in the source file for an <code>imagefile</code> asset, you specify the value for the <code>urlpicture</code> field like this:</p> <pre>&lt;urlpicture&gt;relative_path_to/ filename.jpg &lt;/urlpicture&gt;</pre> <p>Note that you must specify the location of the file with a relative path—relative to the directory in which you are running the XMLPost utility.</p>

## Action Variable Property

The `RemoteContentPost` element expects to find the variable `Action`. If this variable is missing or it is set to `addrow`, `RemoteContentPost` creates a new asset. To handle editing assets, you set the value of `Action` to `update` in their source file.

If you want to edit assets through XMLPost, include the following property in the configuration file for the asset type:

```
postAction: y
```

## Sample XMLPost Configuration File

Here is a sample configuration file named `imagefile.ini`, used to import `imagefile` assets for the Burlington Financial sample site.

```
xmlpost.xmlfilenamefilter: xml
#xmlpost.xmlproxypost: Future
#xmlpost.xmlproxyport: 80
xmlpost.url: http://localhost/servlet/ContentServer
xmlpost.numargs: 6
xmlpost.argname1: pagename
xmlpost.argvalue1: OpenMarket/Xcelerate/Actions/RemoteContentPost
xmlpost.argname2: AssetType
```

```
xmlpost.argvalue2: ImageFile
xmlpost.argname3: authusername
xmlpost.argvalue3: user_author
xmlpost.argname4: authpassword
xmlpost.argvalue4: user
xmlpost.argname5: inifile
xmlpost.argvalue5: futuretense.ini
xmlpost.argname6: publication
xmlpost.argvalue6: BurlingtonFinancial
```

```
xmlpost.success: Success
xmlpost.failure: Error
xmlpost.logfile: ImageFilePost.txt
```

```
postpublication: y
postprimarypubid: y
postpublist: y
```

```
postAction: y
```

```
postcategory: y
truncategory: 4
```

```
postcreatedby: y
trunccreatedby: 64
```

```
postpath: y
truncpath: 255
```

```
postname: y
truncname: 32
```

```
posttemplate: y
trunctemplate: 32
```

```
postsubtype: y
truncsubtype: 24
```

```
poststatus: y
truncstatus: 2
```

```
postcreateddate: y
postenddate: y
```

```
postupdatedby: y
truncupdatedby: 64
```

```
postfilename: y
truncfilename: 64
```

```
poststartdate: y
```

```
postdescription: y
truncdescription: 128

postsource: y

posturlpicture: y
fileurlpicture: y

posturlthumbnail: y
fileurlthumbnail: y

postmimetype: y
postwidth: y
postheight: y
postalign: y
postaltext: y

postkeywords: y
multikeywords: combine
trunckeywords: 128

postimagedate: y
```

## XMLPost Source Files

Source files must be made up of well-formed XML without the need for a document type definition (DTD) file. Actually, the configuration file functions something like a DTD file in that it defines the tags that are in the source files and the source files cannot use tags that are not included in the configuration file.

The data in your source files must be tagged with tags whose names match the column names for the table that holds assets of that type. For example, a source file for a Burlington Financial imagefile asset uses tags named `name`, `caption`, `picuturerurl`, and so on.

This chapter does not describe how to automate the generation of your XML source files. How you create your source files depends on the source of your data and the tools that you have to convert your data into XML files. This chapter describes what needs to be in your source files and what XMLPost does with them.

## Sample XMLPost Source File

Here is a sample source file for a Burlington Financial imagefile asset. Its tags are defined in the sample configuration file in the previous section, “Sample XMLPost Configuration File” on page 354:

```
<document>
<name>High Five 25</name>
<keyword>Five</keyword>
<category>a</category>
<artist>by Ann. Artist</artist>
<alttext>Congratulations</alttext>
<align>CENTER</align>
```

```
<caption>A man extends <keyword>congratulations</keyword> with a
boy.</caption>
<pictureurl>/images/eZine/highfive.jpg</pictureurl>
</document>
```

## How the Data is Passed (Posted)

All of the text contained between a pair of XML tags in a source file is passed to the `RemoteContentPost` element from `XMLPost` as a variable that uses the `Variables.tagName` syntax convention.

For example, this line of code:

```
<name>High Five</name>
```

is sent to `RemoteContentPost` as `Variables.name` and the value of `name` is the string “High Five”.

## Editing an Existing Asset

To edit an existing asset through `XMLPost`, set the `Action` variable to `update` in the source file, as follows:

```
<Action>update</Action>
```

Note that the configuration file for the asset type must also contain an entry for the `Action` variable, as does the example configuration file in “Sample `XMLPost` Configuration File” on page 354.

## XMLPost and File Encoding

If the data in a source file does not use the CSEE system’s default file encoding but the database can accommodate that character set, you can specify the alternate file encoding in the XML version statement at the beginning of the file.

For example:

```
<?xml version= "1.0" encoding="UTF-8" ?>
```

## Using the XMLPost Utility

You can invoke the XMLPost utility in one of many ways:

- From the command line
- From a script or batch file
- From a program

No matter how you start XMLPost, you must provide the following pieces of information:

- The name of the configuration file to use
- The source files, which can be specified as a single file, a list of files, or a directory of files

### Before You Begin

Before you can use the XMLPost utility, the following must be true:

- Your asset types are created. (Otherwise, there are no database tables to import the assets in to.)
- Your CSEE sites are created and the appropriate asset types are enabled for each site.
- If you are using workflow, your workflow processes are created.
- Your Start Menu shortcuts are created and, if you are using workflow, they assign the appropriate workflow process to the appropriate asset types.
- The templates for the asset type are created.
- The association fields for the asset types are created. However, to use XMLPost to set the value of an association field requires custom code. See “Customizing RemoteContentPost and PreUpdate” on page 361 for more information.

### Running XMLPost from the Command Line

Complete the following steps:

1. Place the configuration file and source files in a directory on a system that has CSEE installed.
2. Run the following command (on a single command line) from that directory:

#### Windows

```
% java -cp installdir\cs.jar;installdir\MSXML.jar
    COM.FutureTense.XML.Post.XMLPostMain
    -sSourcefile.xml -cConfigfile.ini
```

#### Solaris

```
% java -cp installdir/cs.jar:installdir/MSXML.jar
    COM.FutureTense.XML.Post.XMLPostMain
    -sSourcefile.xml -cConfigfile.ini
```

Where *installdir* is the classpath to the *cs.jar* and the *MSXML.jar* files, *Sourcefile* is the name of the source file, and *Configfile* is the name of the configuration file. (Note that there are several options for designating the source file. See “Options for Identifying Source Files” on page 359 for information.)

**Note**

If the source files and configuration file are not in the directory that you are working in, you must provide the path to those files in the command line. For example: `-s/products/product.xml`.

**Options for Identifying Source Files**

The source parameter that you use to identify the source files to the XMLPost utility can point to any of the following:

- A single file.
- A directory of files. All the files in that directory that have the file extension (typically `.xml`) designated by the configuration file will be posted (imported).
- A list file that provides a list of all the files that you want to import. It is similar to an `.ini` file but it has a file extension of `.lst`.

**A Single File**

To post the contents of one file, specify the name of that file in the command line. The following example (Solaris) instructs XMLPost to use a configuration file named `articlepost.ini` and one source file named `article.xml`:

```
% java -cp installdir/cs.jar:installdir/MSXML.jar
      COM.FutureTense.XML.Post.XMLPostMain
      -sarticle.xml -carticlepost.ini
```

**A Directory of Files**

To post all the files in a directory, specify the path to that directory in the command line. The following example (Solaris) instructs XMLPost to import the files in the `xmlpostfiles` directory:

```
% java -cp installdir/cs.jar:installdir/MSXML.jar
      COM.FutureTense.XML.Post.XMLPostMain
      -s/xmlpostfiles -carticlepost.ini
```

**A List File**

As an alternative to specifying a directory, you can create a list file that uses the format of a `.ini` file and includes the following properties:

- `numfiles`, which specifies how many files are included in the list.
- `fileN`, which specifies the path to a file and its file name. The *N* stands for the file's order in the list file. The first file listed is `file1`, the second is `file2`, and so on.

The value of *N* for the last `fileN` in the list must match the value specified by the `numfiles` property. XMLPost stops importing when it has imported as many files as it is told to expect by the `numfiles` property. If you have included more files than `numfiles` states, XMLPost does not import them.

The file extension for a list file must be `.lst`.

Here is an example list file, named `xmlpostfiles.lst`:

```
numfiles: 3
file1: c:\xmlpos\article1.xml
file2: c:\xmlpost\article2.xml
```

```
file3: c:\xmlpost\article3.xml
```

To post the files referenced in this file list, specify the name of the list file in the command line. The following example (Windows NT) instructs XMLPost to import the files specified in the `xmlpostfiles.lst` file:

```
% java -cp installdir\cs.jar;installdir\MSXML.jar
    COM.FutureTense.XML.Post.XMLPostMain
    -sc:\xmlpostfiles.lst -carticlepost.ini
```

## Running XMLPost as a Batch Process

When you want to import assets of more than one type (which requires you to run the utility separately for each asset type because you must identify a different configuration file for each), it is convenient to run XMLPost from a batch file.

In the batch file, include a command line statement for each asset type: a statement that identifies the configuration file and the location of the source files. You can use any of the ways described in the preceding section to identify the source files.

## Running XMLPost Programmatically

You can also invoke the XMLPost utility programmatically by creating an XMLPost object and calling the `doIt` method `doIt(String[] args)`, where the input is a string array. The elements of the array are the same flags that you use when running XMLPost from the command line.

For example:

```
String args [] = {"-sSourcefile.xml", "-cConfigfile.ini"};
COM.FutureTense.XML.Post.XMLPost poster = new
COM.FutureTense.XML.Post.XMLPost();
try {
poster.doIt(args);
} catch (Exception e) {
ics.LogMsg("error in XMLPost under program control");
}
```

Note that you must include the complete path to the source files and the configuration file.



## Customizing RemoteContentPost and PreUpdate

If necessary, you can customize the XMLPost process by adding or modifying code in the RemoteContentPost element or the PreUpdate element for your asset types.

If you want to import information about an asset to other tables, you must modify the PreUpdate element for that asset type.

This section provides two customization examples:

- Customizing the PreUpdate element for the article asset type so that it sets headline information in the description field. There is a description column in the Article table but the field in the **New** or **Edit** article form is called **Headline**.
- Customizing the PreUpdate element for the article asset type so that it can add associations to articles.

### Setting a Field Value Programmatically

The article asset type has a special condition: it has a field in the **New** and **Edit** forms called **Headline**, but the value for **Headline** is stored in the description column in the Article table. In order for headline text to be written to the correct column in the Article table when an article asset is imported (that is, the description column), the PreUpdate element for the article asset type was modified.

First, examine the sample configuration file named ArticlePost.ini that is located in the Xcelerate/Samples/XMLPost directory in your CS-Direct product kit. It has a tag specified for the **Headline** field:

```
# headline gets stored in the description field
postheadline: y
```

The following code in the PreUpdate element for the article asset type writes the data that RemoteContentPost passes in as Variable.headline to the correct database column:

```
<if COND="IsVariable.headline=true">
<then>
  <ASSET.SET NAME="theCurrentAsset" FIELD="description"
    VALUE="Variables.headline"/>
</then>
</if>
```

This example uses a tag called ASSET.SET. This tag sets data in a field for the asset that is currently in memory. It takes three parameters:

- **NAME** (required). The name of the asset object that is in memory. This asset object must have been previously instantiated either with the ASSET.LOAD tag or the ASSET.CREATE tag. By convention, CS-Direct uses the name theCurrentAsset to refer to the current asset object.
- **FIELD** (required). The name of the field whose value you want to set. The name of this field must exactly match the name of a column in the storage table for assets of this type.
- **VALUE** (required). The data to be inserted in the column.

## Setting an Asset Association

If an asset has an association with another asset, that information is written to the `AssetRelationTree` table. Because the standard behavior of `XMLPost` is to write asset information to the primary storage table of the asset type only, you must modify the `PreUpdate` element for the asset type if you want to specify asset associations.

For example, the article asset type has an association field named **MainImageFile**. When a content provider creates an article asset, she selects the appropriate imagefile asset in this field.

Examine the sample configuration file named `ArticlePost.ini` that is located in the `Xcelerate/Samples/XMLPost` directory in your CS-Direct product kit. It has a tag specified for the **MainImageFile** association field:

```
postMainImageFile-name: y
```

The following code in the `PreUpdate` element for the article asset type writes the data that `RemoteContentPost` passes in as `Variable.mainimagefile` to the correct database table:

```
<if COND="IsVariable.MainImageFile-name=true">
<then>
  <ASSET.LOAD NAME="anAssociatedImage" TYPE="ImageFile"
  FIELD="name" VALUE="Variables.MainImageFile-name"/>
  <if COND="IsError.Variables.errno=false">
    <then>
      <ASSET.GET NAME="anAssociatedImage" FIELD="id"
      OUTPUT="imageid"/>
      <ASSET.ADDCHILD NAME="theCurrentAsset" TYPE="ImageFile"
      CHILDDID="Variables.imageid" CODE="MainImageFile"/>
    </then>
  </if>
</then>
</if>
```

### Note

The `ASSET.ADDCHILD` tag creates only the link between the two assets; it does not create the associated asset. In order for this code to work, the asset specified with the `CHILDDID` parameter must already exist in the Content Server database.

This example uses a tag named `ASSET.ADDCHILD`. This tag associates a child asset with the asset that is currently held in memory. It takes five parameters:

- **NAME** (required). The name of the asset object that is in memory. This asset object must have been previously instantiated either with the `ASSET.LOAD` tag or the `ASSET.CREATE` tag. By convention, CS-Direct uses the name `theCurrentAsset` to refer to the current asset object.
- **TYPE** (required). The asset type of the child asset.
- **CHILDDID** (required). The ID of the child asset.
- **CODE** (optional). The name of the association. This value is written to the `ncode` column in the `AssetRelationTree` table.

- **RANK** (optional). A numeric value to establish an order for the child assets. This value is written to the `nrank` column in the `AssetRelationTree` table.

For information about `ASSET.GET` and `ASSET.LOAD`, see the *CSEE Developer's Tag Reference*.

## Troubleshooting XMLPost

This is a brief list of some possible problems that can occur when you run the XMLPost utility.

### **XMLPost does not run and does not create a log file message**

There are two possible reasons for XMLPost to not start:

- The server name specified in the `xmlpost.url` property setting in your configuration file is not a valid server name. Examine this property and make sure that the server name is correct.
- Content Server is not running on the system you are importing to. Start it.

### **XMLPost fails and there is a “Missing Entity” statement in the log file**

When you see this message in the log file, it means that there is invalid XML in the source file. Typically, your XML includes HTML code and that code includes special HTML characters that are not referred to by their character entity codes. For best coding practice, embed any HTML code in a `<![CDATA[ . . . ]]>` tag.

### **Error 105 is triggered when XMLPost tries to save an asset**

There are several reasons why saving an asset can cause a database error.

One common reason for this error code is when the data that XMLPost tries to save to a specific column (field) is too large for that column. Resolving this depends on your goals. If it is okay for XMLPost to truncate the data that doesn't fit into the column, you can add a `truncatag` property to the configuration file. For example, `truncbody: 2000`.

Another common reason for this error code is that an asset of that type with the same name already exists. Try changing the name of the asset and importing the asset again.

## Debugging the Posting Element

If you have modified the `RemoteContentPost` element in any way or have created your own posting element, you can use the XML Debugger utility to test it before you use it.

To use XML Debugger, replace `ContentServer` with `DebugServer` in the `xmlpost.url` property setting.

For example, change `xmlpost.url: http://6ipjk/servlet/ContentServer` to `xmlpost.url: http://6ipjk/servlet/DebugServer`

For more information about the XML Debugger utility, see Chapter 5, “CSEE Tools and Utilities.”



## Chapter 17

# Importing Flex Assets

Chapter 16, “Importing Assets” presents the core information about using the XMLPost utility. If your CSEE configuration includes CS-Direct Advantage and you are using the flex asset data model, you have more tools for importing your assets.

CS-Direct Advantage provides three additional posting elements for the XMLPost utility and a bulk processing utility named BulkLoader.

This chapter describes the additional posting elements for the XML-Post utility. It contains the following sections:

- Overview
- XMLPost and the Flex Asset Model
- Importing the Structural Asset Types in the Flex Model
- Importing Flex Assets with XMLPost
- Editing Flex Assets with XMLPost
- Deleting Assets with XMLPost

This chapter refers to the BulkLoader utility, but for in-depth information about how to run it, see Chapter 18, “Importing Flex Assets with the BulkLoader Utility.”

## Overview

CS-Direct Advantage provides two methods for importing assets that use the flex data model into the Content Server database:

- XMLPost. CS-Direct Advantage provides three additional posting elements that work with XMLPost: `addData`, `modifyData`, and `deleteData`.
- The BulkLoader utility.

## Importing the Data Structure Flex Asset Types

Before you can use either method, you must first create or import the data design or “structural” asset types into your flex families with XMLPost and the standard posting element, `RemoteContentPost`, provided by the CS-Direct product. That is, first you create or import the attribute editors, flex attributes, flex definitions, and flex parent definitions with the standard XMLPost posting element. If you are using the BulkLoader utility, the flex parents must also be imported with XMLPost or created.

## Importing the Flex Assets

After you import your data structure asset types, then you can import your flex assets with one of the two import methods, depending on the situation:

- Use BulkLoader to import a large number—thousands or hundreds of thousands—of flex assets.
- Use the CS-Direct Advantage posting element to load a moderate number—hundreds—of flex and flex parent assets.

### When to Use BulkLoader

When working within the basic asset model, it is typical to use XMLPost to import assets into the database on the management system and then publish those assets to the delivery system. This methodology changes with flex assets because the volume of data involved in a flex asset data model tends to be much greater than that in a basic asset model.

You use the BulkLoader utility during the initial setup of your CSEE system. See Chapter 18, “Importing Flex Assets with the BulkLoader Utility.”

### When to Use XMLPost

For regular or incremental updates after the initial setup of your CSEE system—perhaps some or all of your data originates in an ERP system, for example—you use the XMLPost utility and the `addData` posting element.

## Importing Flex Assets: The Process

Because assets using the flex model have dependencies on each other, flex asset types must be imported in a specific sequence. And, as with basic assets, the asset types must exist, there must be sites created, and so on before you can use XMLPost to import assets.

For information about the basic prerequisites for using XMLPost that apply to all asset types (both asset models), see “Before You Begin” on page 358.

After those basic requirements are met, you must import your flex asset types into the Content Server database on the management system in the following sequence:

1. Attribute editors are optional, but if you plan to use them you must either import them or create them before you import your flex attributes. The configuration file must instruct XMLPost to call the `RemoteContentPost` element. For information, see “Attribute Editors” on page 369.
2. Flex attributes. The configuration file must instruct XMLPost to call the `RemoteContentPost` element. For information, see “Flex Attributes” on page 371.
3. Flex parent definitions. The configuration file must instruct XMLPost to call the `RemoteContentPost` element. For information, see “Flex Definitions and Flex Parent Definitions” on page 375.

Flex definitions. The configuration file must instruct XMLPost to call the `RemoteContentPost` element. For information, see “Flex Definitions and Flex Parent Definitions” on page 375.

#### Note

You must import the flex parent definitions in the proper order. That is, if a parent definition refers to another parent definition asset, the referenced asset must already exist in the database.

It is typical to import parent definitions one hierarchical level at a time, starting with the top level definitions.

4. Flex parent assets. Do one of the following:
  - If you are going to use XMLPost to import the flex assets, you can either import the flex parents individually or you can import them as part of the flex family tree for a flex assets.
  - If you are going to use the BulkLoader utility to import the flex assets, you must first use XMLPost to import the flex parent assets. The configuration file must instruct XMLPost to call the `RemoteContentPost` element. The file cannot specify the `addData` element because you are importing the parents without the entire family tree for the flex assets.

For information, see “Flex Parents” on page 379.

5. (Optional) If you plan to use the BulkLoader utility to import flex assets into both the management system and the delivery system, you must first approve and publish all of the structural assets (attribute editors, flex attributes, flex definitions, parent definitions, and flex parents) from the management system to the delivery system.
6. Flex assets. Do one of the following:
  - Use the BulkLoader utility. See Chapter 18, “Importing Flex Assets with the BulkLoader Utility.”
  - Use XMLPost. See “Importing Flex Assets with XMLPost” on page 380.

You must follow the sequence outlined in the preceding steps because there are dependencies built in to the data structure of a flex asset family. Additionally, note the following dependencies:

- If you have attributes of type `asset` and a flex parent or flex asset has such an attribute, the asset that you designate as the value of that attribute field must have already been created or imported.

- An asset that you set as the value for an attribute of type `asset` must be of the correct asset type.

## XMLPost and the Flex Asset Model

The XMLPost utility works the same no matter which asset model or CSEE product you are using. However, CS-Direct Advantage provides additional processing logic in some of its standard elements for the flex asset types to support XMLPost because flex assets store their data in more than one database table (unlike basic asset types, which have one database table).

Additionally, CS-Direct Advantage provides both a posting element that enables you to use XMLPost to edit flex assets (`modifyData`) and a posting element that enables you to use XMLPost to delete assets of any type (`deleteData`).

This chapter provides additional information about creating configuration and source files specifically for the asset types in a flex family (and attribute editors). Be sure to also read Chapter 16, “Importing Assets” for basic information that pertains to all XMLPost configuration and source files.

In the flex asset model, you specify a different posting element based on the following categories of asset types:

- Structural asset types that give the flex asset type and flex parent asset type their data structure. That is, attribute editors, attributes, flex definitions, and flex parent definitions.

Use the standard CS-Direct posting element `RemoteContentPost` to import the structural asset types. (You cannot use the `addData` element with assets of these types.)

- Flex and flex parent asset type. (For example, the product and product parent types in the GE Lighting sample site.)

Depending on the situation, you can use either the CS-Direct Advantage posting element `addData` to import the flex and flex parent asset types or the CS-Direct posting element `RemoteContentPost`. (See “Flex Parents” on page 379 and “Importing Flex Assets with XMLPost” on page 380 for information about which posting element to use.)

In both cases, you create configuration files and source files (as described in “Overview” on page 366 and supplemented in this chapter), and then invoke the XMLPost utility (as described in “Using the XMLPost Utility” on page 358).

## Internal Names vs. External Names

When you create your flex family of asset types (see “Step 1: Create a Flex Family or a New Flex Family Member” on page 297), you specify both an internal and an external name for your asset types.

The internal name is used for the primary storage table in the database. The external name is used in the CS-Direct Advantage **New**, **Edit**, and **Inspect** forms, in search results list, and so on. For example, the internal name for the attribute editor asset type is `AttrTypes` but that name is not used in the user interface. And the internal name for the GE Lighting sample site’s article asset type is `AArticles` but that name is not used in the user interface.



Because XMLPost communicates with the database, you must always use the internal name of the asset type in the configuration files and source files. For example, in a configuration file for attribute editors, you would specify the following:

```
postargname2: AssetType
postargvalue2: AttrTypes
```

## Importing the Structural Asset Types in the Flex Model

All of the information about configuration and source files for basic assets that is presented in Chapter 16, “Importing Assets” applies to the configuration and source files for the flex asset types.

Additionally, this section provides example configuration and source files for the structural flex asset types.

### Attribute Editors

Attribute editors store their data in one table, named `AttrTypes`. `AttrTypes` is the internal name of the attribute editor asset type. Be sure to use this name in your configuration file for attribute editors.

The following table describes the configuration file properties and source file tags that you use with attribute editors:

Attribute editor tag and property	Description
tag: <code>&lt;name&gt;</code> property: <code>postname</code>	Required.  Name of the attribute editor asset; this is a required value for all asset types. Attribute names are limited to 64 characters and cannot contain spaces.
tag: <code>&lt;description&gt;</code> property: <code>postdescription</code>	Optional.  Description of the use or function of the attribute.
tag: <code>&lt;AttrTypeText&gt;</code> property: <code>postAttrTypeText</code>	Required.  Either the name of the file with the attribute editor XML code, or the actual code.  This tag corresponds to the <b>XML in file</b> field and <b>Browse</b> button and the <b>XML field</b> in the <b>New</b> and <b>Edit</b> attribute editor forms in the Content Server interface.

## Sample Configuration File: Attribute Editor

This is a sample configuration file for the attribute editor asset type. It works with the sample source file immediately following this example.

```
xmlpost.xmlfilenamefilter: .xml
xmlpost.url: http://izod19/servlet/ContentServer
xmlpost.numargs: 6
xmlpost.argname1: pagename
xmlpost.argvalue1: OpenMarket/Xcelerate/Actions/RemoteContentPost
xmlpost.argname2: AssetType
xmlpost.argvalue2: AttrTypes
# notice that you use the internal name of the asset type

xmlpost.argname3: authusername
xmlpost.argvalue3: user_editor
xmlpost.argname4: authpassword
xmlpost.argvalue4: user
xmlpost.argname5: inifile
xmlpost.argvalue5: futuretense.ini
xmlpost.argname6: startmenu
xmlpost.argvalue6: New Attribute Editor

xmlpost.success: Success
xmlpost.failure: Error
xmlpost.logfile: attreditorpostlog.txt

xmlpost.deletefile: y

postpublication: y

postname: y
postdescription: y
postAttrTypeText: y
```

## Sample Source File: Attribute Editor

The following source file is tagged for importing a check box attribute editor, or presentation object, for the GE Lighting sample catalog. It works with the preceding sample configuration file.

```
<document>
<publication>GE Lighting</publication>
<name>Editor4-CheckBoxes</name>
<description>Attribute Type Four Check Box</description>
<AttrTypeText>
<![CDATA[
<?XML VERSION="1.0"?>
<!DOCTYPE PRESENTATIONOBJECT SYSTEM "presentationobject.dtd">
  <PRESENTATIONOBJECT NAME="CheckBoxTest">
    <CHECKBOXES LAYOUT="VERTICAL">
      <ITEM>Red</ITEM>
      <ITEM>Green</ITEM>
      <ITEM>Blue</ITEM>
```

```

    </CHECKBOXES>
</PRESENTATIONOBJECT>
]]>
</AttrTypeText>
</document>

```

## Flex Attributes

Flex attributes have several tables but XMLPost writes to only two of them: the main storage table (for example, the `PAttributes` table for the GE Lighting sample site) and the attribute asset type's `_Extension` table (`PAttributes_Extension`, for example).

This means that the source file section of the configuration file must specify and the source file itself must use tags that represent columns in both tables. Those source file tags and configuration file properties are as follows:

Flex attribute tag and property	Description
tag: <code>&lt;name&gt;</code> property: <code>postname</code>	Required. Name of the attribute; this is a required value for all asset types. Attribute names are limited to 64 characters and cannot contain spaces.
tag: <code>&lt;description&gt;</code> property: <code>postdescription</code>	Optional. Description of the use or function of the attribute.
tag: <code>&lt;valuestyle&gt;</code> property: <code>postvaluestyle</code>	Optional. Whether the attribute can hold a single value (S) or multiple values (M). If no this tag is not used, the attribute is set to hold a single value by default. The attribute data type of <code>url</code> has been deprecated and replaced with the <code>blob</code> type in the 4.0 version of CS-Direct Advantage. If you are still using the <code>url</code> data type, note that you cannot specify M if the data type is <code>url</code> .
tag: <code>&lt;type&gt;</code> property: <code>posttype</code>	Required. The data type of the attribute. Valid options are <code>asset</code> , <code>date</code> , <code>float</code> , <code>int</code> , <code>money</code> , <code>string</code> , <code>text</code> , or <code>blob</code> . For definitions of these data types, see “Data Types for Attributes” on page 180.
tag: <code>&lt;assettypename&gt;</code> property: <code>postassettypename</code>	Required if <code>&lt;type&gt;</code> is set to <code>asset</code> . The name of the asset type that the attribute holds.

Flex attribute tag and property	Description
tag: <upload> property: postupload	<p>Required if &lt;type&gt; is set to blob (or url, which is deprecated in 4.0).</p> <p>The path to the directory that you want to store the attribute values in. Note that the value that you enter in this field is appended to the value set as the default storage directory (defdir) for the attribute table by the cc.urlattrpath property in the gator.ini file (which is FutureTense/futuretense_cs/ccurl/ by default).</p>
tag: <attributetype> property: postattributetype	<p>Optional.</p> <p>The name of the attribute editor to use, if applicable.</p>
tag: <enginename> property: postenginename	<p>Optional.</p> <p>If you are using a search engine on your management system, the name of the search engine. At this point, the only option for this tag is AV, for AltaVista.</p>
tag: <charsetname> property: postcharsetname	<p>Optional.</p> <p>The search engine character set to use. By default, it is set to ISO 8859-1.</p>
tag: <editing> property: postediting	<p>Foreign attributes only.</p> <p>Whether a foreign attribute can be edited through the CS-Direct Advantage forms (L), or edited externally using a third-party tool (R). L is the default.</p>
tag: <storage> property: poststorage	<p>Foreign attributes only.</p> <p>Whether the values for a foreign attribute are to be stored in a _Mungo table in the Content Server database (L) or in a foreign table (R). L is the default.</p>
tag: <externalid> property: postexternalid	<p>Foreign attributes only.</p> <p>The name of the column that serves as the primary key for the table that holds this foreign attribute, that is, the column that uniquely identifies the attribute</p>
tag: <externalcolumn> property: postexternalcolumn	<p>Foreign attributes only.</p> <p>The name of the column in the foreign table that holds the values for this attribute.</p>

Flex attribute tag and property	Description
tag: <externaltable> property: postexternaltable	Foreign attributes only. The name of the foreign table that contains the columns identified by externalid and external column.
tag: <publication> property: postpublication	Optional. The names of all the sites that can use this attribute.

## Sample Configuration File: Flex Attribute

This is sample configuration file for the product attribute asset type from the GE Lighting sample site. It works with the sample source file immediately following this example.

```
xmlpost.xmlfilenamefilter: .xml

xmlpost.url: http://izod19/servlet/ContentServer
xmlpost.numargs: 6
xmlpost.argname1: pagename
xmlpost.argvalue1: OpenMarket/Xcelerate/Actions/RemoteContentPost
xmlpost.argname2: AssetType
xmlpost.argvalue2: PAttributes
# Notice that this is the internal name of the asset
# type. The external name of this asset type is
# Product Attribute.

xmlpost.argname3: authusername
xmlpost.argvalue3: user_editor
xmlpost.argname4: authpassword
xmlpost.argvalue4: user
xmlpost.argname5: inifile
xmlpost.argvalue5: futuretense.ini
xmlpost.argname6: startmenu
xmlpost.argvalue6: New Product Attribute

xmlpost.success: Success
xmlpost.failure: Error
xmlpost.logfile: attributespostlog.txt

xmlpost.deletefile: y

postpublication: y
postname: y
postattributetype: y
postdescription: y
postvaluestyle: y
posttype: y
```

```
postediting: y
poststorage: y
postenginename: y
poststatus: y
postassettypename: y
postupload: y
postexternalid: y
postexternalcolumn: y
postexternaltable: y
postcharsetname: y
```

## Sample Source File: Attribute

This is a sample source file for importing a product attribute named `footnotes` for the GE Lighting sample site. It works with the preceding sample configuration file.

```
<document>
<publication>GE Lighting</publication>
<name>footnotes</name>
<description>Footnotes</description>
<valuestyle>S</valuestyle>
<type>URL</type>
<editing>L</editing>
<storage>L</storage>
</document>
```

### Note

Remember that all the dependencies and restrictions concerning the data type of a flex attribute apply whether you are creating an attribute through the Content Server interface (the **New** or **Edit** flex attribute forms) or through XMLPost. For information, read “Step 3: Create Flex Attributes” on page 300.

## Flex Definitions and Flex Parent Definitions

The flex definition and flex parent definition asset types are very similar and you code their configuration and source files in nearly the same way. They require several of the same tags in their source files and the same properties in their configuration files. Each has one additional property/tag.

The source file tags and configuration file properties for flex definitions and flex parent definitions are listed in the following table. Note that they are case-sensitive.

Flex definition and flex parent definition tag and property	Description
tag: <code>&lt;internalname&gt;</code> property: <code>postinternalname</code>	Required. The name of the asset; this is a required value for all asset types. Flex definition and flex parent definition names are limited to 64 characters and they cannot contain spaces.
tag: <code>&lt;internaldescription&gt;</code> property: <code>postinternaldescription</code>	Optional. The description of the use or function of the asset.
tag: <code>&lt;renderid&gt;</code> property: <code>postrenderid</code>	Optional. For flex definitions only. The ID of the template asset that is to be assigned to all the flex assets that are created with this flex definition.
tag: <code>&lt;parentselectstyle&gt;</code> property: <code>postparentselectstyle</code>	Optional. For flex parent definitions only. Defines how flex parents are to be selected when a user creates a flex asset using the definition. This property/tag represents the <b>Parent Select Style</b> field in the <b>New</b> and <b>Edit</b> parent definition forms. When using the tag in the source file, the options are <code>treepick</code> and <code>selectboxes</code> .
The next four tags and properties perform the same function as the buttons and fields in the <b>Product Parent Definition</b> section on the <b>New</b> and <b>Edit</b> forms for parent definitions and flex definitions. See “Step 4: (optional) Create Flex Filter Assets” on page 304 and “Step 5: Create Flex Definition Assets” on page 309.	
tag: <code>&lt;OptionalSingleParentList&gt;</code> property: <code>postOptionalSingleParentList</code>	Use this tag to specify any single optional parent definition.

Flex definition and flex parent definition tag and property	Description
tag: <RequiredSingleParentList> property: postRequiredSingleParentList	Use this tag to specify any single required parent definition.
tag: <RequiredMultipleParentList> property: postRequiredMultipleParentList	Use this tag to specify more than one required parent definitions.
tag: <OptionalMultipleParentList> property: postOptionalMultipleParentList	Use this tag to specify more than one optional parent definition.
<p>The next three tags and properties perform the same functions as the buttons and fields in the <b>Attributes</b> section on the <b>New</b> and <b>Edit</b> forms for flex definitions and flex parent definitions. See “Step 4: (optional) Create Flex Filter Assets” on page 304 and “Step 5: Create Flex Definition Assets” on page 309.</p>	
tag: <RequiredAttrList> property: postRequiredAttrList	The list of attributes that are required for the flex parents or the flex assets that use the definition.
tag: <OptionalAttrList> property: postOptionalAttrList	The list of attributes that are optional for the flex parents or the flex assets that use the definition.
tag: <OrderedAttrList> property: postOrderedAttrList	<p>The order in which all attributes, be they required or optional, should appear in the <b>New</b>, <b>Edit</b>, <b>Inspect</b>, and so on forms.</p> <p>If you use this tag, it replaces the other attribute tags. The example source file in this section shows an example of how to use this tag in a source file.</p>

A configuration file must include all the properties that could be used by any one of the assets of the type that the configuration file works with. The individual source files include only the tags that are needed to define those individual assets.



## Sample Configuration File: Flex Definition

The following example is a configuration file used to import product definitions for the GE Lighting sample site. It works with the sample source file immediately following this example.

```
xmlpost.url: http://izod19/servlet/ContentServer
xmlpost.numargs: 6
xmlpost.argname1: pagename
xmlpost.argvalue1: OpenMarket/Xcelerate/Actions/RemoteContentPost
xmlpost.argname2: AssetType
xmlpost.argvalue2: ProductTmpIs
# Notice that this is the internal name of the asset type.
# The external name of this asset type is
# Product Definition.

xmlpost.argname3: authusername
xmlpost.argvalue3: user_editor
xmlpost.argname4: authpassword
xmlpost.argvalue4: user
xmlpost.argname5: inifile
xmlpost.argvalue5: futuretense.ini
xmlpost.argname6: startmenu
xmlpost.argvalue6: New Product Definition

xmlpost.success: Success
xmlpost.failure: Error
xmlpost.logfile: productdefpostlog.txt
xmlpost.deletefile: y

postpublication: y
postinternalname: y
postinternaldescription: y

postparentselectstyle: y

postOptionalSingleParentList: y
postRequiredSingleParentList: y
postRequiredMultipleParentList: y
postOptionalMultipleParentList: y

postRequiredAttrList: y
postOptionalAttrList: y
postOrderedAttrList: y

postrenderid: y
```

## Sample Source File: Flex Definition

The following source file, `lighting.xml`, is the source for a product definition named Lighting for the GE Lighting sample site. It works with the preceding sample configuration file.

```
<document>
<publication>GE Lighting</publication>
<internalname>Lighting</internalname>
<internaldescription>Generic Lighting Template</
internaldescription>
<RequiredAttrList>sku</RequiredAttrList>
<OptionalAttrList>
productdesc;caseqty;bulbshape;bulbsize;basetype;
colortemp;meanlength;lightcenterlength;reducedwattage;beamspread;
fixturetype;ballasttype;colorrenderingindex;minstarttemp;powerfact
or;
totalharmonicdist;spreadbeam10h;spreadbeam10v;spreadbeam50h;
spreadbeam50v;halogen;operatingposition;filamenttype;bulbimage;
baseimage;filamentimage;footnotes;price;life;voltage;wattage
</OptionalAttrList>
<parentselectstyle>treepick</parentselectstyle>
<OptionalMultipleParentList>SubCategory</
OptionalMultipleParentList>
</document>
```

Examine the list of attributes, above. When you include multiple values in a tag, separate them from each other with a semicolon (;).

Note that while GE Lighting uses the optional/multiple parent model, there are these other possible configurations:

```
<OptionalSingleParentList>flexparentdefinition
</OptionalSingleParentList>
<RequiredSingleParentList>flexparentdefinition
</RequiredSingleParentList>
<RequiredMultipleParentList>flexparentdefinition
</RequiredMultipleParentList>
```

## Supplying a List of Ordered Attributes

If you want to use the `<OrderedAttrList>` tag because the attributes need to be displayed in a specific order, do not also include the `<RequiredAttrList>` and `<OptionalAttrList>` tags. In the string contained in the `<OrderedAttrList>` tag, specify which attributes are required and which are optional, as follows:

- For required attributes, precede the attribute name with R (required)
- For optional attributes, precede the attribute name with O (optional)
- Be sure to list the attributes in the desired order.
- Be sure to use a semicolon (;) to separate the values.

For example:

```
<OrderedAttrList>Rsku;Oproductdesc;Ocaseqty;Obulbshape;
Obulbsize;Obasetype;Ocolortemp;Omeanlength;Olightcenterlength;
Oreducedwattage;</OrderedAttrList>
```

## Flex Parents

You can use XMLPost to import flex parent assets in two ways:

- Individually. You code a separate XMLPost source file for each flex parent and an XMLPost configuration file that identifies the asset type and the pagename for the standard RemoteContentPost posting element. If you plan to use the BulkLoader utility, you must first import the flex parent assets with XMLPost in this way.
- As part of the flex family tree for a flex asset. If you are using XMLPost to import your flex assets (rather than the BulkLoader), you can combine the flex parents with the flex assets and import the flex parents as a part of a flex family tree, within the context of a specific flex asset. You code a separate XMLPost source file for each flex asset and identify all the parents for that flex asset in that source file. XMLPost then creates the variables for one flex asset and multiple flex parents (if they do not yet exist) when it parses the source file.

This section describes the source and configuration file for importing them individually. For information about importing them with the flex assets, see “Importing Flex Assets with XMLPost” on page 380.

### Sample Configuration File: Individual Flex Parent

The following example is a configuration file used to import product parents for the GE Lighting sample site. It works with the sample source file immediately following this example.

```
xmlpost.xmlfilenamefilter: .xml

xmlpost.url: http://izod19/servlet/ContentServer
xmlpost.numargs: 6
xmlpost.argname1: pagename
xmlpost.argvalue1: OpenMarket/Xcelerate/Actions/RemoteContentPost
xmlpost.argname2: AssetType
xmlpost.argvalue2: ProductGroups
# notice that you use the internal name of the asset type

xmlpost.argname3: authusername
xmlpost.argvalue3: user_editor
xmlpost.argname4: authpassword
xmlpost.argvalue4: user
xmlpost.argname5: inifile
xmlpost.argvalue5: futuretense.ini
xmlpost.argname6: startmenu
xmlpost.argvalue6: New Product Parent

xmlpost.success: Success
xmlpost.failure: Error
xmlpost.logfile: productdefpostlog.txt
xmlpost.deletefile: y

postpublication: y
postinternalname: y
postinternaldescription: y
postflexgrouptemplateid: y
```

```

postfgrouptemplatename: y
postParentList: y
postcat1: y
postcat2: y

```

## Sample Source File: Individual Flex Parent

The following source file creates a product parent (flex parent) named Halogen for the GE Lighting sample. It works with the preceding sample configuration file.

```

<document>
<publication>GE Lighting</publication>
<internalname>Halogen</internalname>
<fgrouptemplatename>Category</fgrouptemplatename>
<cat1>Halogen</cat1>
</document>

```

Remember that when you use the RemoteContentPost posting element, you must provide one source file for each parent asset.

## Importing Flex Assets with XMLPost

Before you can use XMLPost to import flex assets, you must have already imported the structural asset types (attributes, flex definitions, and flex parent definitions).

There are two posting elements that you can use for flex assets, RemoteContentPost or addData:

- The addData posting element creates parent assets for the flex asset if they do not yet exist. For example, if you are not using the BulkLoader utility, you use this posting element for the initial import of your flex assets.

When you use the addData posting element, the source file must specify the entire family tree for the flex asset. You need a separate source file for each flex asset, but you can specify any number of parents for that flex asset in that source file and XMLPost creates the flex asset and its parents (if they do not yet exist).

- The RemoteContentPost element creates flex assets and sets values for their parents. Those parents must already exist. For example, if you plan to use BulkLoader once, just for the initial import and will use XMLPost from then on, you might want to use this posting element.

When you use RemoteContentPost to import a flex asset, the source file must specify only the asset's immediate parents (which requires you to include fewer lines of code). However, if you need to create a new flex parent for the new flex asset, you must use the addData posting element and specify the entire family tree in the source file.

## Configuration File Properties and Source File Tags for Flex Assets

As with the structural asset types, you must use the internal name of the flex and flex parent asset types in your configuration and source files.

However, unlike the structural asset types, you do not need to include an argument for the asset type in the configuration file. Source files for flex assets have a required tag that identifies the asset type so you do not have to repeat this information in the configuration file.

### For the addData Posting Element

The following table lists the source file tags and configuration file properties for flex assets (and their flex parents) when you are using the addData posting element. Note that they are case-sensitive.

Tag and property	Description
tag: <code>&lt;_ASSET_&gt;</code> property: <code>post_ASSET_</code>	Required. The internal name of the asset type. For example, the internal asset type names of the GE Lighting sample site flex assets are Products, AArticles, and AImages.
tag: <code>&lt;_TYPE_&gt;</code> property: <code>post_TYPE_</code>	Required. The name of the flex definition that this flex asset is using.
tag: <code>&lt;_ITEMNAME_&gt;</code> property: <code>post_ITEMNAME_</code>	Required. The name of the asset.
tag: <code>&lt;_ITEMDESCRIPTION_&gt;</code> property: <code>post_ITEMDESCRIPTION_</code>	Optional. The description of the asset.

Tag and property	Description
tag: <_GROUP_parentDefinitionName> property: post_GROUP_parentDefinitionName	Optional. The flex asset's parents. The configuration file must include a tag for each possible parent definition. For example, if your flex assets could have parents that use either of two parent definitions named Division and Department, the configuration file needs two properties that define a tag for each: post_Group_Department post_Group_Division See "Specifying the Parents of a Flex Asset" on page 388 for more information about using this tag and property.
tag: <_GROUPDESCRIPTIONS_> property: post_GROUPDESCRIPTIONS_	Optional. If the parent that you are designating is new, you can also include the description of the parent definition.
tag: <displaytype> property: postdisplaytype	Optional. The name of the template asset for the flex asset.
tag: <AttributeName> property: postAttributeName	Include a property in the configuration file for each attribute that assets of the type can have (both required and optional). The source files then need to supply a value for each required attribute and any optional ones that apply to that asset. For example, if there were an attribute named SKU, you would include a property called postSKU and in the source files, would include lines of code like this: <SKU>123445</SKU> .

## For the RemoteContentPost Posting Element

The following table lists the source file tags and configuration file properties for flex assets (and their flex parents) when you are using the RemoteContentPost posting element. Note that they are case-sensitive.

Tag and property	Description
tag: <code>&lt;_DEFINITION_&gt;</code> property: <code>post_DEFINITION_</code>	Required. The name of the flex definition that this flex asset is using. (Note that <code>post_TYPE</code> will also work.)
tag: <code>&lt;_ITEMNAME_&gt;</code> property: <code>post_ITEMNAME_</code>	Required. The name of the asset.
tag: <code>&lt;_ITEMDESCRIPTION_&gt;</code> property: <code>post_ITEMDESCRIPTION_</code>	Optional. The description of the asset.
tag: <code>&lt;ParentList&gt;</code> property: <code>post_ParentList</code>	Optional. The flex asset's immediate parents.
tag: <code>&lt;template&gt;</code> property: <code>posttemplate</code>	Optional. The name of the template asset for the flex asset. (Note that <code>postdisplaytype</code> will also work.)
tag: <code>&lt;AttributeName&gt;</code> property: <code>postAttributeName</code>	Include a property in the configuration file for each attribute that assets of the type can have (both required and optional). The source files then need to supply a value for each required attribute and any optional ones that apply to that asset. For example, if there were an attribute named <code>SKU</code> , you would include a property called <code>postSKU</code> and in the source files, would include lines of code like this: <code>&lt;SKU&gt;123445&lt;/SKU&gt; .</code>

## Sample Flex Asset Configuration File for addData

This is a sample configuration file for the product asset type from the GE Lighting sample site. It invokes the addData posting element and works with the source file example immediately following this example file.

```
xmlpost.xmlfilenamefilter: .xml

#xmlpost.proxyhost: Future
#xmlpost.proxyport: 80

xmlpost.url: http://wally9:80/servlet/ContentServer

# notice that it uses addData
# rather than RemoteContentPost
xmlpost.postnumargs: 5

xmlpost.argname1: pagename
xmlpost.argvalue1: OpenMarket/Gator/XMLPost/addData

# Notice that you do not need to provide
# the name of the asset type because that information
# is required in the source files for flex assets.

xmlpost.argname2: inifile
xmlpost.argvalue2: futuretense.ini
xmlpost.argname3: authusername
xmlpost.argvalue3: editor
xmlpost.argname4: authpassword
xmlpost.argvalue4: xceleeditor
xmlpost.argname5: startmenu
xmlpost.argvalue5: New Product

xmlpost.success: Success
xmlpost.failure: Error
xmlpost.logfile: productdatalog.txt

xmlpost.postdeletefile: y

post_ASSET_: y
post_ITEMNAME_: y
post_TYPE_: y
post_GROUP_Category: y
post_GROUP_SubCategory: y
postpublication: y
postsku: y
postproductdesc: y
postcaseqty: y
postbulbshape: y
postbulbsize: y
postbasetype: y
postcolortemp: y
postmeanlength: y
```



```

postlightcenterlength: y
postreducedwattage: y
postbeamspread: y
postfixturetype: y
postballasttype: y
postcolorrenderingindex: y
postminstarttemp: y
postpowerfactor: y
posttotalharmonicdist: y
postspreadbeam10h: y
postspreadbeam10v: y
postspreadbeam50h: y
postspreadbeam50v: y
posthalogen: y
postoperatingposition: y
postfilamenttype: y
postbulbimage: y
postbaseimage: y
postfilamentimage: y
postfootnotes: y
postcat1: y
postcat2: y
postprice: y
postvoltage: y
postwattage: y
postlife: y

```

## Configuration File Properties and Attributes of Type Blob (or URL)

If the asset type has an attribute of type `blob` (or `url`), the configuration file needs two entries for the tag that references the attribute: one to identify the attribute and one to identify the file name of either a) the file that holds the content for the attribute (an upload field) or b) the name that you want Content Server to give the file that it creates from text entered directly into a text field (a text field of type `blob` or `URL`).

### Attribute of Type Blob (or URL) as an Upload Field

There are no attributes of type `blob` in the GE Lighting sample site. However, let's say that there is an attribute of type `blob` named `footnotes`. It is an upload field with a **Browse** button for finding the file rather than a text field that you enter text in to. Therefore it has two properties:

- `posttag`, which in this scenario is `postfootnotes: y`
- `filetag`, which in this scenario is `filefootnotes: y`

When you include a value for this attribute in a source file, you use the following convention:

```
<footnotes>FileName.txt</footnotes>
```

Note that when you are importing an asset that has this kind of field (attribute), the file that holds the text that you want to store as the attribute value for the flex asset must be located in the same directory as the source file for the asset.

### Attribute of Type Blob (or URL) as a Text Field

If the fictitious `footnotes` attribute is a field that takes text directly rather than a file, the configuration file requires the following properties:

- `postfootnotes: y`
- `postfootnotes_file: y`

Then, when you include a value for the attribute in the source file, you use the following convention:

```
<footnotes>lots and lots of text</footnotes>
<footnotes_file>FileNameYouWantUsed.txt</footnotes_file>
```

## Sample Flex Asset Source File for addData

This following source file works with the example flex asset configuration file preceding this section. This source file creates a lightbulb product named 10004 from the product definition named Lighting:

```
<document>

# the first three tags are required
<_ASSET_>Products</_ASSET_>
<_ITEMNAME_>10004</_ITEMNAME_>
<_TYPE_>Lighting</_TYPE_>

# This tag is required because the publication is
# not set in the configuration file
<publication>GE Lighting</publication>

# This tag assigns a template asset to the product
<displaytype>Lighting Detail</displaytype>

# The rest of these tags set flex attribute values for the product
<price>5</price>
<sku>10004</sku>
<productdesc>F4T5/CW</productdesc>
<caseqty>24</caseqty>
<bulbshape>T</bulbshape>
<bulbsize>5</bulbsize>
<basetype>Miniature Bipin (G5)</basetype>
<colortemp>4100</colortemp>
<meanlength></meanlength>
<lightcenterlength></lightcenterlength>
<reducedwattage></reducedwattage>
<beamspread></beamspread>
<fixturetype></fixturetype>
<ballasttype></ballasttype>
<colorrenderingindex>60</colorrenderingindex>
<minstarttemp></minstarttemp>
<powerfactor></powerfactor>
<totalharmonicdist></totalharmonicdist>
<spreadbeam10h></spreadbeam10h>
<spreadbeam10v></spreadbeam10v>
```

```

<spreadbeam50h></spreadbeam50h>
<spreadbeam50v></spreadbeam50v>
<halogen></halogen>
<operatingposition></operatingposition>
<filamenttype></filamenttype>
<bulbimage>BLB-260.gif</bulbimage>
<baseimage>BLB-250.gif</baseimage>
<filamentimage></filamentimage>
<footnotes>
</footnotes>
<life>6000</life>
<voltage></voltage>
<wattage>4</wattage>
<cat1>Fluorescent</cat1>
<cat2>Preheat Lamps</cat2>

<!-- GROUP tags that specify the parents. Remember that you have
to
specify the entire family tree for the flex asset when using the
addData posting element-->

<_GROUP_Category>Fluorescent</_GROUP_Category>
<_GROUP_SubCategory>Preheat Lamps</_GROUP_SubCategory>
</document>

```

The preceding source file set the product's parent to Preheat Lamps and the parent of Preheat Lamps to Fluorescent.

## Handling Special Characters

XMLPost uses the HTTP POST protocol, which means that it sends data in an HTTP stream. Therefore, certain characters are considered to be special characters and must be encoded because they are included in URLs.

If your source file includes attribute values that contains any of the special characters listed in the following table, be sure to replace all instances of that character with its corresponding URL encoding sequence, found in the Values for Special Characters section of this guide.

## Flex Assets and Their Parents

The GROUP tags specify the parents in the family tree. When XMLPost uses the addData posting element and parses the GROUP section of the source file, it does the following:

1. Determines which parent definitions are legal for an asset using this flex definition.
2. For each legal parent definition, it verifies whether the source file specifies a parent of that definition:
  - If yes, it sets the parent and if the parent does not yet exist, it creates the parent.
  - If no, it does not set the parent. However, if a parent of that definition is required, it returns an error.

## Specifying the Parents of a Flex Asset

To specify the parents of a flex asset, you provide the name of the parents nested in the `<_GROUP_parentDefinitionName>` tag. For example:

```
<_GROUP_subcategory>Blacklights</_GROUP_subcategory>
```

Where `subcategory` is the name of the parent definition for the Blacklights parent (product parent).

Remember that you must specify the entire family tree for the flex asset. In the GE Lighting sample site, a product asset has a parent and a grandparent. In addition to specifying the parent for the lightbulb (Blacklight), you need to specify the grandparent. For example:

```
<_GROUP_subcategory>Blacklights</_GROUP_subcategory>
<_GROUP_category>Fluorescent</_GROUP_category>
```

## Setting Attribute Values for Parents

How does XMLPost know which parent the attribute values belong to? It does not. If an attribute can belong to more than one parent, you must specify which parent it belongs to. For example, let's say that the `bulbshape` attribute is assigned to parents rather than products. In this case, you would include a line of code such as this:

```
<bulbshape>Halogen=T</bulbshape>
```

## Setting Multiple Values in a Flex Source File

All of the tags that configure parents and the tags that specify attributes (as long as the attribute is configured to accept multiple values) can handle multiple values. Those tags are as follows:

- `_GROUP_parentDefinitionName`
- `_GROUPDESCRIPTIONS_`
- the attribute tags

When you have multiple parents from the same definition for a flex asset, you provide all of the names of the parents in the same `_GROUP_parentDefinitionName` tag and you use a semicolon (;) to separate the parent names.

For example:

```
<_GROUP_Category>Incandescent;Halogen</_GROUP_Category>
```

When XMLPost imports this asset, it sets its parents as Incandescent and Halogen, which are both of the Category parent definition. If Incandescent and Halogen do not exist yet, XMLPost creates them.

You use a similar syntax when you want to set multiple attribute values for the multiple parents. Once again, let's say that the Category definition requires that parents of that definition have a value for the `bulbshape` attribute. You can set the value of the `bulbshape` attribute for both of the parents that were specified by the `<_GROUP_Category>` tag as follows:

```
<bulbshape>Incandescent=E;K:Halogen=T</bulbshape>
```

Note the following about this syntax:

- You use `parentName=attributeValue` pairs to set the attribute value (Halogen=T).

- You use a colon to separate the parents from each other (Incandescent=S:Halogen=T).
- You use a semicolon to separate the attribute values for a parent when that parent has more than one value for the attribute (Incandescent=E;K:Halogen=T).

And, as mentioned, you can specify descriptions for the parents that you identify in the same tag, too. For example:

```
<_GROUPDESCRIPTIONS>
Incandescent=From Detroit:Halogen=From Chicago
</_GROUPDESCRIPTIONS>
```

## Sample Flex Asset Configuration File for RemoteContentPost

This is a sample configuration file for the product asset type from the GE Lighting sample site. It works with the source file example immediately following this example file.

```
xmlpost.xmlfilenamefilter: .xml

#xmlpost.proxyhost: Future
#xmlpost.proxyport: 80

xmlpost.url: http://wally9:80/servlet/ContentServer
xmlpost.numargs: 5

xmlpost.argname1: pagename
xmlpost.argvalue1: OpenMarket/Xcelerate/Actions/RemoteContentPost

# Notice that you do not need to provide
# the name of the asset type because that information
# is required in the source files for flex assets.

xmlpost.argname2: inifile
xmlpost.argvalue2: futuretense.ini
xmlpost.argname3: authusername
xmlpost.argvalue3: editor
xmlpost.argname4: authpassword
xmlpost.argvalue4: xceleeditor
xmlpost.argname5: startmenu
xmlpost.argvalue5: New Product

xmlpost.success: Success
xmlpost.failure: Error
xmlpost.logfile: productdatalog.txt

xmlpost.postdeletefile: y

postpublication: y

post_ITEMNAME_: y
post_DEFINITION_: y
posttemplate: y

postsku: y
```

```
postproductdesc: y
postcaseqty: y
postbulbshape: y
postbulbsize: y
postbasetype: y
postcolortemp: y
postmeanlength: y
postlightcenterlength: y
postreducedwattage: y
postbeamspread: y
postfixturetype: y
postballasttype: y
postcolorrenderingindex: y
postminstarttemp: y
postpowerfactor: y
posttotalharmonicdist: y
postspreadbeam10h: y
postspreadbeam10v: y
postspreadbeam50h: y
postspreadbeam50v: y
posthalogen: y
postoperatingposition: y
postfilamenttype: y
postbulbimage: y
postbaseimage: y
postfilamentimage: y
postfootnotes: y
postcat1: y
postcat2: y
postprice: y
postvoltage: y
postwattage: y
postlife: y

postParentList: y
```

## Sample Flex Asset Source File for RemoteContentPost

This following source file works with the example configuration file immediately preceding this section. This source file creates a lightbulb product named 10004 from the product definition named Lighting:

```
<document>

# the first three tags are required
<_ASSET_>Products</_ASSET_>
<_ITEMNAME_>10004</_ITEMNAME_>
<_DEFINITION_>Lighting</_DEFINITION_>

# This tag is required because the publication is
# not set in the configuration file
<publication>GE Lighting</publication>
```

```

# This tag assigns a template asset to the product
<template>Lighting_Detail</template>

# The rest of these tags set flex attribute values for the product
<price>5</price>
<sku>10004</sku>
<productdesc>F4T5/CW</productdesc>
<caseqty>24</caseqty>
<bulbshape>T</bulbshape>
<bulbsize>5</bulbsize>
<basetype>Miniature Bipin (G5)</basetype>
<colortemp>4100</colortemp>
<colorrenderingindex>60</colorrenderingindex>
<bulbimage>BLB-260.gif</bulbimage>
<baseimage>BLB-250.gif</baseimage>
<filamentimage></filamentimage>
<life>6000</life>
<voltage></voltage>
<wattage>4</wattage>
<cat1>Fluorescent</cat1>
<cat2>Preheat Lamps</cat2>

# this tag sets the immediate parents only
<ParentList>Preheat Lamps</ParentList>

</document>

```

The preceding source file sets several attribute values for the product and sets its immediate parent to Preheat Lamps. This parent must already exist.

## Editing Flex Assets with XMLPost

You can edit the following information for flex assets and flex parent assets with XMLPost:

- The value of an attribute
- The asset's parents (either the flex asset's parents or the parent's parents)

You cannot edit attribute assets, flex definition assets, or flex parent definition assets with XMLPost.

To edit the attribute value for a flex asset, the source file needs to include only the name of the asset and the attribute that you want to change.

To edit the attribute value for a flex parent, you must provide the context of a flex asset. The source file must name the flex asset and can then reference just parent and the parent attribute that you want to change. But you must specify a flex asset for XMLPost to start with so that it can work its way through the family tree.

## Configuration Files for Editing Flex Assets

There are two differences in the configuration file for editing a flex asset: the pagename argument and an additional tag and property.

### Pagename Argument

The pagename argument must be set to: `OpenMarket/Gator/XMLPost/modifyData`.

For example:

```
xmlpost.argname1: pagename
xmlpost.argvalue1: OpenMarket/Gator/XMLPost/modifyData
```

You invoke XMLPost from the command line as usual, identifying the configuration file and the source files.

### Additional Tag/Property

You can use the following optional tag and property when you are editing a flex asset:

- tag: `<_REMOVE_parentDefinitionName>`
- property: `post_REMOVE_parentDefinitionName`

It removes a parent from the flex asset.

## Source Files for Editing Flex Assets

The source file for an edited flex asset does not need to include all the information for that asset—you only need to provide the information that you want to change. Any attributes that you do not specify are not modified in any way.

### Changing the Value of an Attribute

To change the value of an attribute, you specify the new attribute value in the source file. When XMLPost runs the import, it writes over the old value with the value provided in the source file.



The following sample source file changes two attribute values (bulbshape and bulbsize) for the GE Lighting product named 10004 that was defined in “Sample Flex Asset Source File for addData” on page 386.

```
<document>
<!-- predefined xml tags (required) -->
  <_ASSET_>Products</_ASSET_>
  <_ITEMNAME_>10004</_ITEMNAME_>
  <_TYPE_>Lighting</_TYPE_>

<!-- attribute xml tags -->
  <bulbshape>E</bulbshape>
  <bulbsize>9</bulbsize>
</document>
```

## Removing an Attribute Value

To remove an attribute value and leave it blank, code a line that names the attribute but does not specify a value for it.

For example:

```
<bulbsize></bulbsize>
```

You can also edit attribute values for parents. Let’s say that the bulbsize attribute is set at the parent level. If that were the case, the following lines of code would set two parents and provide a value for bulbsize for each:

```
<_GROUP_SubCategory>All-Weather Lamps;Appliance Lamps
</GROUP_SubCategory>
<bulbsize>All-Weather Lamps=10:Appliance Lamps=8</bulbsize>
```

### Option 1

This line of code clears the bulbsize for the All-Weather Lamps parent:

```
<bulbsize>All-Weather Lamps=:Appliance Lamps=8</bulbsize>
```

### Option 2

Alternatively, you could just use this line of code, without repeating the value for Appliance Lamps:

```
<bulbsize>All-Weather Lamps=</bulbsize>
```

## Editing Parent Relationships

You can use XMLPost to make the following edits to the parent relationships for a flex asset:

- Add another parent to the existing parents.
- Change a parent from one parent to another.

The `GROUP_parentDefinitionName` tag works differently than do the attribute tags.

- When you use an attribute tag, XMLPost writes the new value over the old value.
- When you use a `GROUP_parentDefinitionName` tag, XMLPost does not overwrite an old parent with a new parent, even when the parent definition name is the same—it adds the new parent to the list of parents that the asset has, which may not be what you want.

To add another parent to the list of existing parents, include the line of code in the source file. For example:

```
<_GROUP_SubCategory>Blacklights</_GROUP_SubCategory>
```

If you want to remove a parent, use the `<_REMOVE _>` tag. Note that you must be careful not to remove a required parent unless you are replacing it.

```
<_REMOVE_Processor>Appliance Lamps</_REMOVE_Processor>
```

## Deleting Assets with XMLPost

If you have CS-Direct Advantage, you can use XMLPost to delete any asset of any type. There are two requirements:

- Your configuration file must instruct XMLPost to call the `deleteData` element.

For example:

```
xmlpost.argname1: pagename  
xmlpost.argvalue1: OpenMarket/Gator/XMLPost/deleteData
```

- There are two required source file tags and configuration file properties:

`<_ASSET_>/post_ASSET_` which identifies the asset type of the asset you want to delete.

`<_ITEMNAME_>/post_ITEMNAME_` which identifies the asset you want to delete.

When XMLPost uses this posting element, it changes the value in the `Status` column for that asset to VO for void. (It does not physically remove it from the database).

## Configuration Files for Deleting Assets

Here is an example configuration file:

```
xmlpost.xmlfilenamefilter: .xml  
  
xmlpost.url: http://izod19/servlet/ContentServer  
xmlpost.numargs: 4  
xmlpost.argname1: pagename  
xmlpost.argvalue1: OpenMarket/Gator/XMLPost/deleteData  
xmlpost.argname2: authusername  
xmlpost.argvalue2: user_editor  
xmlpost.argname3: authpassword  
xmlpost.argvalu3: user  
xmlpost.argname4: inifile  
xmlpost.argvalue4: futuretense.ini  
  
xmlpost.success: Success  
xmlpost.failure: Error  
xmlpost.logfile: productdefpostlog.txt  
xmlpost.deletefile: y  
  
postpublication: y  
post_ASSET_: y  
post_ITEMNAME_: y
```

You invoke XMLPost from the command line as usual.

## Source Files for Deleting Assets

The source files for deleting assets are short and simple. For example:

```
<document>
  <_ASSET_>Products</_ASSET_>
  <_ITEMNAME_>Pentium 90</_ITEMNAME_>
  <publication>my publication</publication>
</document>
```

This code instructs XMLPost to delete a product asset named `Pentium 90` (it changes the status of `Pentium 90` to `VO`, for void).



## Chapter 18

# Importing Flex Assets with the BulkLoader Utility

This chapter describes the BulkLoader utility, which you use to import flex assets during the initial setup of your CSEE system.

It contains the following sections:

- Overview of BulkLoader
- Importing Flex Assets from Flat Tables
- Importing Flex Assets Using a Custom Extraction Mechanism
- Approving Flex Assets with the BulkApprover Utility

## Overview of BulkLoader

The BulkLoader utility enables you to quickly extract large amounts of flex asset data in a user-defined way from your own data sources and import that data into the Content Server database on any of your systems (development, management, testing, or delivery).

The extraction mechanism is abstracted away using a Java interface that customers can implement. BulkLoader invokes methods on this interface to extract input data from your data sources. For backward functional and data compatibility, Content Server Enterprise Edition also includes an implementation of this Java interface so that BulkLoader will still be able to extract data from an external JDBC-compliant data source.

## BulkLoader Features

Features in BulkLoader include the following:

- Support for a user-defined extraction mechanism, using a Java API. Users can provide a custom implementation of this extraction interface or use the built-in support for extracting from a JDBC data source.
- Support for inserts, voids, and updates of flex asset and group data.
- Support for incremental inserts, voids and updates.

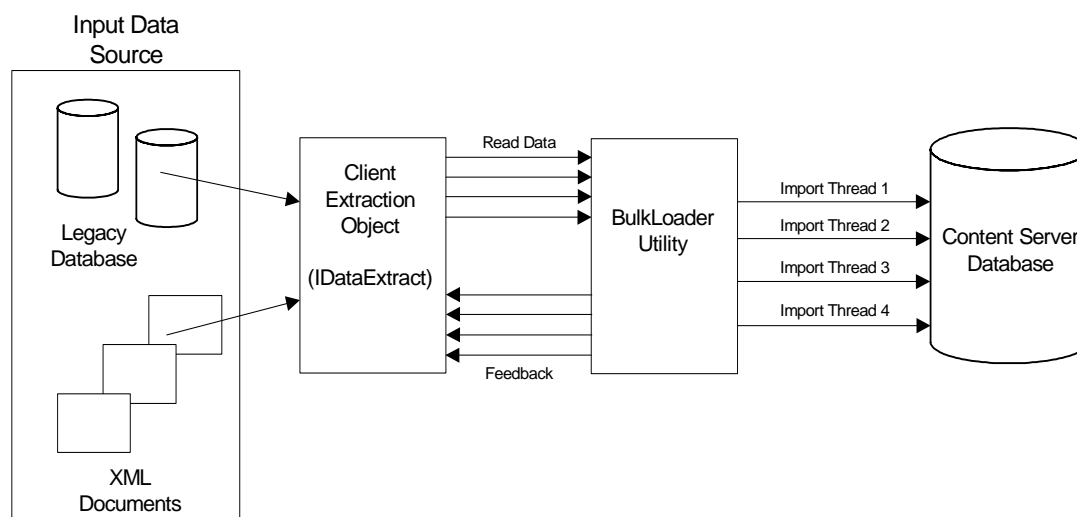
- Performance improvements for higher throughput, using concurrent multi-threaded import operations while data extraction is in progress.
- Support for chunk (slice) processing of input data.
- Support for importing asset data that belongs to multiple flex families.
- Backward functional and data compatibility. Supports importing asset data from an external JDBC source.

## How BulkLoader Works

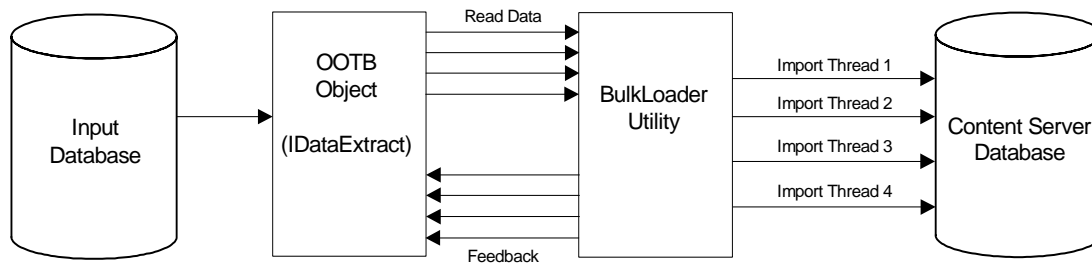
The BulkLoader has been redesigned for higher performance, throughput, and scalability. Instead of reading all input data and then generating output SQL files, BulkLoader reads input data in chunks. As soon as each chunk is read, it is handed over to an import thread while the main BulkLoader thread goes back to read the next chunk. The import thread uses a direct JDBC connection to the Content Server database. In this way, reading and importing are done in parallel, thereby achieving higher throughput. For scalability, users can increase the number of BulkLoader import threads if the database machine's hardware has additional CPUs and an I/O configuration that supports higher concurrency.

The BulkLoader utility requires a configuration file containing parameters that specify the number of processing threads, the name of the Java class that implements the data extraction interface, commit frequency, the starting unique ID to be used as the asset ID, and more.

The following diagrams show a client-specific implementation and the built-in “out of the box” implementation supplied by FatWire:



**Figure 2:** Client-specific implementation of BulkLoader



**Figure 3:** Built-in OOTB (“out of the box”) implementation of BulkLoader

## Using the BulkLoader Utility

There are two ways to use the BulkLoader depending on how you supply input data to import into the Content Server database.

- If you want BulkLoader to import input data from an external JDBC data source, you provide input data in a flat table or view.
- If you want to provide your own way of supplying input data to the BulkLoader, you use a Java object that implements the extraction interface, `IDataExtract`.

## Importing Flex Assets from Flat Tables

This section describes the general procedure that you use to import flex assets with BulkLoader, followed by subsequent sections that describe each step in detail. Using this model, you can import new flex assets and parents, as well as void assets that were previously imported. This model also supports changing and deleting attribute values for existing assets.

### The Basic Steps

The basic process of importing flex assets with the BulkLoader utility is as follows:

1. Use XMLPost to import the structural assets into the Content Server database on the management system. The structural flex assets are as follows: attribute editors, flex attributes, flex parent definitions, flex definitions, and flex parent assets.
2. Write a view or a stored procedure that gives you a view of the source database that you want to import into the Content Server database as a flat table. This flat table is your source table.
3. In the same source database, create a mapping table with two columns: one column that lists the names of the columns in the source file and the other column that lists the names that are used for those attributes in the Content Server database.
4. Code a configuration file that identifies the source table and the mapping table.
5. Put the configuration file on a system from which you have access to both the Content Server database on the management system, and to your source database.

Stop the application server on the management system.

Run the BulkLoader utility. Bulkloader will import the flex asset data and gives the feedback in a table named `bulk_feedback`, that has been created at the input data source.

6. Restart the application server on the management system.
7. Use the BulkApprover utility to approve all of the assets that were loaded

#### Note

Because the BulkLoader utility is designed for speed, it does **not** check for the existence of the attributes or flex parent definitions or flex definitions. You must import all of the structural asset types before you run the BulkLoader utility.

## Driver Requirements

The BulkLoader requires JDBC (or Java DataBase Connectivity) drivers, which are not provided by FatWire, inc. You must obtain JDBC drivers for both the source database and the destination database, that is, the Content Server database, even if your Content Server database is MS SQL2000.

If you have a source database that is ODBC-compliant, you can use a JDBC-ODBC bridge, which is included as part of the Java SDK from Sun. For MS SQL2000, however, that is not recommended—use JNet Direct, instead.

## Requirement for DB2

If you are using the DB2 database with your Content Server system, you must run the `usejdbc2.bat` file on the client machine before you can use BulkLoader. You only need to run the batch file once; then you can run BulkLoader as usual.

## Step 1: Use XMLPost to Import Structural Assets

Use XMLPost and the `RemoteContentPost` posting element to import the structural assets into the Content Server database on the management system. Import assets of the following types:

- attribute editors
- flex attributes
- flex parent definitions
- flex definitions
- flex parent assets

For information about this step, see “Importing the Structural Asset Types in the Flex Model” on page 369.



## Step 2: Create the Input Table (Data Source)

You must create input flat tables (data sources) for holding all new asset data and for holding update data. These are flat tables/views in which each row corresponds to a single CS-Direct Advantage flex asset item and each column corresponds to a CS-Direct Advantage flex attribute asset for the BulkLoader utility.

There is no requirement regarding the names of columns in the data source, but you must supply a separate mapping table, described in “Step 3: Create the Mapping Table” on page 403.

### Inserts

The name of the data source table is specified by the `inputTable` parameter in the configuration file.

The source table must also include the names of the following four columns, which you specify in the configuration file with the following properties:

- `inputTableTemplateColumn` – The name of the column in the source table that holds the names of the flex definitions.
- `inputTableNameColumn` – The name of the column in the source table that holds the names of the flex assets. The name of this column cannot exceed 64 characters.
- `inputTableDescriptionColumn` – The name of the column in the source table that holds the description of the flex assets.
- `inputTableGroupsColumn` – The name of the column in the source table that holds the names of the parent definitions. Each value in this column can include multiple flex parent definition names, separated by the `multivalueDelimiter` character, which is defined in the configuration file.

Note that you can optionally specify the name of the column that serves as a unique identifier for each input item, using the following parameter in the configuration file: `inputTableUniqueIdColumn`. If there is no value assigned for this parameter, BulkLoader will generate a unique identifier for each input item and store it in a mapping table (`bulkloader_ids`) in the Content Server database.

This is an example of a source table (input table):

SNSID	SNSTEMPLATE	SNSGROUPS	SNSNAME	SNSDESCRIPTION
85000268930			ITEM_GENERATED-85000268929	MDF DBL SIDED MODULE FOR RG710_2376 CONN
85000185620			ITEM_GENERATED-85000185619	SNI 2100 UPGRADE KIT FOR 2ND LINE_1808
85000180864			ITEM_GENERATED-85000180863	RG725VSR2A_2 FIXED COUNT TERM BLK A GAS
83000886790			ITEM_5053-83000886789	Lead test Triplet 42 in 79_153
85000177152			ITEM_GENERATED-85000177151	PARTITION INSERT SET LARGE_ASSEMBLED
83000884146			ITEM_5048-83000884145	Meter voltohm Triplet model 2
85000169964			ITEM_GENERATED-85000169963	6 PR STATION PROT W_HSG_1304VSR2_
83000876536			ITEM_5030-83000876535	Shiphead Carbide Bit 1_2 in x 18 in
85000167122			ITEM_GENERATED-85000167121	A183A4 BACKBOARD
85000166368			ITEM_GENERATED-85000166367	BACKBOARD 184 B 1
85000161206			ITEM_GENERATED-85000161205	CUTTERS POWER END PLATE ONLY 8000452
85000160336			ITEM_GENERATED-85000160335	SLITTER CABLE JACKET TELEPH
85000262836			ITEM_GENERATED-85000262835	REMOTE ANNUNCIATOR DS9447
83000858778			ITEM_5003-83000858777	Tool D914 No Blade
83000856254			ITEM_4994-83000856253	Cord Ground Start for TS21_21806_104
83000852696			ITEM_4937-83000852695	Protector station 6_capacity empty 530_0
83000051838			ITEM_1405-83000051837	House Riser 60in W_Offset End_Slots
83000051902			ITEM_1405-83000051901	House Riser 60in W_Slots Individually Packaged
83000051966			ITEM_1405-83000051965	House Riser Large 60in W_Offset 7 Slots
83000052030			ITEM_1405-83000052029	House Riser Large 60in W_Offset_Slots Individually Packag
85000149960			ITEM_GENERATED-85000149959	BLADE REPL_CUTTER 8000417U
83000849078			ITEM_4928-83000849077	Ground lug_long 2_0_in_for buried service wire_
83000226566			ITEM_2200-83000226565	008F EST_Micro Non_Armored_5_4
83000226630			ITEM_2200-83000226629	010F EST_Micro Non_Armored_35_25
83000226694			ITEM_2200-83000226693	010F EST_Micro Non_Armored_4_3
83000226758			ITEM_2200-83000226757	010F EST_Micro Non_Armored_5_4
83000226822			ITEM_2200-83000226821	012F EST_Micro Non_Armored_35_25
83000226886			ITEM_2200-83000226885	012F EST_Micro Non_Armored_4_3
83000226950			ITEM_2200-83000226949	012F EST_Micro Non_Armored_5_4
83000227014			ITEM_2200-83000227013	018F EST_Micro Non_Armored_35_25
83000227078			ITEM_2200-83000227077	018F EST_Micro Non_Armored_4_3
83000227142			ITEM_2200-83000227141	018F EST_Micro Non_Armored_5_4
83000225850			ITEM_2200-83000225849	002F EST_Micro Non_Armored_35_25
83000225926			ITEM_2200-83000225925	002F EST_Micro Non_Armored_4_3
83000225990			ITEM_2200-83000225989	002F EST_Micro Non_Armored_5_4
83000226054			ITEM_2200-83000226053	004F EST_Micro Non_Armored_35_25

Based on the column names in this source table, the source table properties in the corresponding configuration file would be set as follows:

```
inputTableTemplateColumn=SNSTEMPLATE
inputTableNameColumn=SNSNAME
inputTableDescriptionColumn=SNSDESCRIPTION
inputTableGroupsColumn=SNSGROUPS
```

## Updates

If you want to update attribute data for existing assets, to add new parents or delete existing parents for existing assets, then you need to use the update parameter.

Use the `inputTableForUpdates` parameter in the configuration file to specify the name of the data source table. The source table must also include the names of the following three columns, which you specify in the configuration file with the following properties:

- `inputTableForUpdatesUniqueIdColumn` – The name of the column in the source table that uniquely identifies the flex asset or parent in the Content Server database.
- `inputTableForUpdatesDeleteGroupsColumn` – The name of the column in the source table that specifies a list of parents to be deleted for the current flex asset.
- `inputTableForUpdatesAddGroupsColumn` – The name of the column in the source table that specifies a list of parents to be added for the current flex asset.

BulkLoader interprets column values as follows when applying updates to the attributes:

- A null value in a specific attribute column indicates that the attribute for the current flex asset should be deleted. For example, a null value in the `deletegroups` column indicates that no parents need to be deleted. A null value in the `addgroups` column indicates that no parents need to be added.
- A non-null value indicates that the existing attribute value should be replaced with the given value. For example, a non-null value in the `deletegroups` column specifies a list of parents to be deleted. A non-null value for `addgroups` denotes the addition of new parents to a given flex asset.

### Step 3: Create the Mapping Table

You must also create a mapping table for the BulkLoader utility, and it must have the following two columns:

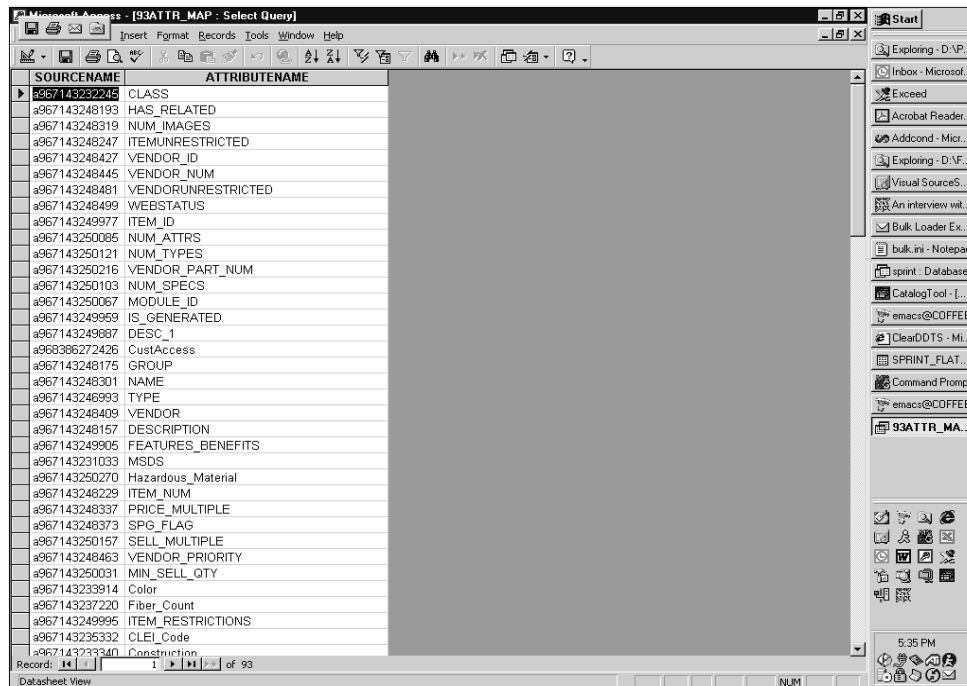
- A column that holds the names of the flex attribute columns in your flat data source
- A column that holds their corresponding names in the Content Server database

The mapping table provides a one-to-one correspondence between these two columns. For example, your source table might have a column of vendor names with an automatically generated name like `A96714328445` that maps to a CS-Direct Advantage product attribute asset named, simply, `VENDOR_ID`.

You include the following configuration file properties for the mapping table:

- `inputAttributeMapTable` – the name of the mapping table file
- `inputAttributeMapTableKeyCol` – the name of the column in the mapping table that lists the attribute names in the source table
- `inputAttributeMapTableValCol` – the name of the column that lists the corresponding attribute asset names in the Content Server database

The following is an example of a mapping table:



SOURCENAME	ATTRIBUTENAME
a967143232245	CLASS
a967143248193	HAS_RELATED
a967143248319	NUM_IMAGES
a967143248247	ITEMUNRESTRICTED
a967143248427	VENDOR_ID
a967143248445	VENDOR_NUM
a967143248481	VENDORUNRESTRICTED
a967143248499	WEBSTATUS
a967143249877	ITEM_ID
a967143250085	NUM_ATTRS
a967143250121	NUM_TYPES
a967143250216	VENDOR_PART_NUM
a967143250103	NUM_SPECS
a967143250067	MODULE_ID
a967143249959	IS_GENERATED
a967143249887	DESC_1
a968386272426	CustAccess
a967143248175	GROUP
a967143248301	NAME
a967143246993	TYPE
a967143248409	VENDOR
a967143248157	DESCRIPTION
a967143249905	FEATURES_BENEFITS
a967143231033	MSDS
a967143250270	Hazardous_Material
a967143248229	ITEM_NUM
a967143248337	PRICE_MULTIPLE
a967143248373	SPG_FLAG
a967143250157	SELL_MULTIPLE
a967143248463	VENDOR_PRIORITY
a967143250031	MIN_SELL_QTY
a967143233914	Color
a967143237220	Fiber_Count
a967143249995	ITEM_RESTRICTIONS
a967143235332	CLEI_Code
a967143233340	Construction

Based on the column names in this source table, the source table properties in the corresponding configuration file would be set as follows:

```
inputAttributeMapTable=93ATTR_MAP
inputAttributeMapTableKeyCol=SOURCENAME
inputAttributeMapTableValCol=ATTRIBUTENAME
```

## Step 4: Create the BulkLoader Configuration File

You configure the BulkLoader utility by creating a configuration file for it that has the properties described in this section. You can name the file anything you want.

You set the properties in the file according to the following syntax:

```
property=value
```

### Note

All property names and values in the configuration file are case-sensitive.

The following table describes properties in a BulkLoader configuration file:

Property Name	Required/ Optional	Comments
maxThreads	Required	The maximum number of concurrent processing threads. This can be the number of database connections to the CSEE database server. Use as many threads as the number of CPUs on the database host. For a single CPU database host, set it to 2. Example: 4
dataSliceSize	Required	Number of items retrieved in one read request; this number will also be processed by a single processing thread. Example: 2000
dataExtractionImplClass	Required	User-specific Implementation class for data extraction API. Needs a constructor with (String configFilename) signature. The one mentioned here is a reference implementation class for backward compatibility. Data in flat tables. Default value ("out of the box"): <code>com.openmarket.gatorbulk.DataExtractImp</code>
initId	Required	Starting CSEE ID used the very first time BulkLoader operates; subsequently will use the value from idSyncFile. Example: 800000000000
idSyncFile	Required	Next available CSEE ID is saved in this file; updated during a BulkLoader session Example: <code>C:\FutureTense\BulkLoaderId.txt</code>
idPoolSize	Required	Each time BulkLoader needs to generate Content server IDs, it collects this many IDs and caches in memory. A good estimate is (number of assets * average number of attributes *2). Example: 1000
commitFrequency	Required	Number of flex asset groups to be part of a database transaction. Example: 100
outputJdbcDriver	Required	The name of the JDBC driver class to access the Content Server database. The value here reflects the Oracle 9.0 driver. Example: <code>oracle.jdbc.driver.OracleDriver</code>

Property Name	Required/ Optional	Comments
outputJdbcURL	Required	The JDBC URL. The following example value is a typical type2 oracle JDBC driver URL: Jdbc:oracle:oci8:@foo
outputJdbcUsername	Required	Content Server database user name
outputJdbcPassword	Required	Content Server database user password
inputTable	Required	Name of the flat, input table from which new asset data is inserted
inputAttributeMapTable	Required	Name of the mapping table that lists the source table columns and the corresponding attribute names.
inputAttributeMapTableKeyCol	Required	The name of the column in the mapping table that lists the source table column names. For example: inputAttributeMapTableKeyCol=SOURCECENAME
inputAttributeMapTableValCol	Required	The name of the column in the mapping table that lists the corresponding attribute names. For example: inputAttributeMapTableValCol=ATTRIBUTEName
inputTableDescriptionColumn	Required	The name of the column in the source table that contains the descriptions of the flex assets. For example: inputTableDescriptionColumn=SENSDESCRIPTION
inputTableGroupsColumn	Required	Name of the column in the source table that contains the names of parents. Each value can include several parents, separated by the <code>multivalueDelimiter</code> character, which is defined in the configuration file. For example: inputTableGroupsColumn=SENSGROUP

Property Name	Required/ Optional	Comments
<code>inputTableNameColumn</code>	Required	The name of the column in the source table that contains the name of the product (or advanced article or advanced image) for each row.  For example: <code>inputTableNameColumn=SNSNAME</code>
<code>inputTableTemplateColumn</code>	Required	The name of the column in the source table that contains the flex definitions.  For example: <code>inputTableTemplateColumn=SNSTEM PLATE</code>
<code>createdby</code>	Required	The user name that you want to be entered in the <code>createdby</code> field for your flex assets.  For example: <code>createdby=editor</code>
<code>initId</code>	Required	The seed value for the first asset ID of the first flex asset that the BulkLoader utility imports. It starts with this value, incrementing for each asset ID that it creates.  For more information, see ““Setting the <code>initID</code> Parameter” on page 409.
<code>multivalueDelimiter</code>	Required	The delimiter that separates multiple attribute values. The default character is the semicolon (;).  For example: <code>multivalueDelimiter=;</code>
<code>siteName</code>	Required	The name of the site. All products will behave as if they were created under this site.  For example: <code>siteName=GE Lighting</code>
<code>status</code>	Required	The status code for all imported flex assets. You should set this to <code>PL</code> for imported.  For example: <code>status=PL</code>
<code>tableProducts</code>	Required	Name of the flex asset type as defined in the Content server database.

Property Name	Required/ Optional	Comments
inputTableUniqueIdColumn	Required	Name of the column in the source table that serves as a unique identifier when importing a new flex asset. This will be used for any subsequent updates and void operations.  Leave this value empty, if you want the BulkLoader to generate unique identifiers for you
targetName	Required	Name of the publish target, as defined in Content Server
renderTemplate	Optional	Name of the template used for rendering flex assets - <i>deprecated</i>
inputFeedbackTable	Required	Name of the table that BulkLoader creates and uses for recording the processing feedback for every input item that was processed. Note that this table is created in the input data source.
inputTableForUpdates	Optional	Needed only if an update action is specified when running the BulkLoader utility. Otherwise, this can be an empty value. This is the name of the source table that contains attributes and parents that need updates.
inputTableForUpdatesUniqueIdColumn	Optional	Needed only if an update action is specified when running the Bulkloader utility. This is the name of the column in the source table that specifies a unique identifier for the flex asset.
inputTableForUpdatesDeleteGroupsColumn	Optional	Needed only if update action is specified and you have one or more flex assets that need one or more parents to be deleted.  This is the name of the column in the source table that specifies the list of parents to be deleted.
inputTableForUpdatesAddGroupsColumn	Optional	Needed only if an update action is specified and you have one or more flex assets that need one or more parents to be added. This is the name of the column in the source table that specifies a list of parents to be added.
inputLimitRows	Optional	Needed only for testing. Limits the number of input items processed for each action (insert, void, or update)



## Setting the initID Parameter

The `initID` parameter is the seed value that the BulkLoader starts at and increments from when creating a unique asset ID for each asset. You must choose a seed value number that allows the BulkLoader to create a contiguous block of ID numbers that cannot cause ID conflicts with existing (or future) asset ID numbers that are generated *by* Content Server.

Currently, Content Server starts at 1 trillion for the asset IDs that it creates. To be sure that you won't have conflicts, select a number low enough that when the BulkLoader utility is done, the highest ID number is under 900,000,000,000.

The BulkLoader creates one asset for each row/column value in the data source table. Each output table row requires its own unique asset ID.

Use these guidelines to determine the approximate number of asset IDs that are created by the BulkLoader utility:

- Five rows for each flex asset, plus
- Two rows per attribute for each flex asset

For example, if your data source table contains the following:

- 10,000 product assets
- 20 attributes per product (as determined by the product definition)
- 10 inherited attributes per product (as determined by the product parent definitions)

Then you need to allow for the following number of IDs:

$$(5 \times 10,000) + (2 \times 30 \times 10,000) = 50,000 + 600,000 = 650,000 \text{ asset IDs}$$

If your `initID` value is 800,000,000,000, then the BulkLoader creates ID numbers ranging from 800,000,000,000 to approximately 800,000,650,000.

## Example Configuration File

The following is an example of the BulkLoader configuration file that you could use with the GE Lighting sample site.

```
# New BulkLoader configuration for backward compatibility
#
# input datasource configuration
inputJdbcDriver=sun.jdbc.odbc.JdbcOdbcDriver
inputJdbcURL=jdbc:odbc:access-db-conn
inputJdbcUsername=
inputJdbcPassword=
#
# Source tables
#
inputTable=PRD_FLAT_50000
inputAttributeMapTable=PRD_FLAT_ATTRIBUTE_MAP
inputAttributeMapTableKeyCol=SOURCENAME
inputAttributeMapTableValCol=ATTRIBUTENAME
#
# input column names
#
inputTableTemplateColumn=CCTemplate
inputTableNameColumn=CCName
inputTableDescriptionColumn=CCDescription
```

```

inputTableGroupsColumn=CCGroups
#
# Content Server database
#
# This database is always used for looking up Attributes,
# Product Types and Product Group Types.
# Data is imported into this database.
#
outputJdbcDriver=oracle.jdbc.driver.OracleDriver
outputJdbcURL=jdbc:oracle:oci8:@foo
outputJdbcUsername=csuser
outputJdbcPassword=csuser
#
# Data-specific settings
#
siteName=GE Lighting
targetName=Mirror Publish to burst37
initId=800000000000
createdby=user_designer
status=PL
renderTemplate=CLighting Detail
MAX_ATTRIBUTES=100
multivalueDelimiter=;
commitFrequency=50
#
# The following denotes the flex asset type that we are importing.
tableProducts=Products
#
# Additional information needed for BulkLoader
maxThreads=2
# dataSliceSize 0 means read all input data in one slice.
dataSliceSize=500
dataExtractionImplClass=com.openmarket.gatorbulk.objects.DataExtra
ctImpl
idSyncFile=C:\\FutureTense50\\bulk_uniqueid.dat
idPoolSize=50000
# For inserts
inputTableUniqueIdColumn=
inputFeedbackTable=bulk_feedback
# For updates
inputTableForUpdates=prod_flat_2_upd
inputTableForUpdatesUniqueIdColumn=input_id
inputTableForUpdatesDeleteGroupsColumn=CCGroups
inputTableForUpdatesAddGroupsColumn=
inputLimitRows=1000
#####

```

## Step 5: Run the BulkLoader Utility

Before you begin, be sure that you have the appropriate JDBC drivers for **both** your **source** database and your **target** Content Server database.

Complete the following steps:

1. Put the configuration file on a system from which you have access to both the Content Server database on the management system, and to your source database.
2. Stop the application server on the management system.
3. Enter the following command, all on a single line, with paths that are appropriate for your installation:

### For UNIX

```
java -ms16m -mx256m -cp <path to gatorbulk.jar>/
gatorbulk.jar;<path to source jdbc driver>/
<source_jdbc_driver>;<path to target jdbc driver>/<target jdbc
driver> com.openmarket.gatorbulk.objects.BulkLoader
config=<bulkloader_configfile> action=<insert|void|update|all>
validate=<yes|no>
```

### For Windows

```
java -ms16m -mx256m -cp <path to
gatorbulk.jar>\gatorbulk.jar;<path to source jdbc
driver>\<source_jdbc_driver>;<path to target jdbc
driver>\<target jdbc driver>
com.openmarket.gatorbulk.objects.BulkLoader
config=<bulkloader_configfile> action=<insert|void|update>
validate=<yes|no>
```

Note that the action parameter specifies what BulkLoader needs to do: insert, void, or update. Setting the validate parameter to yes makes BulkLoader do extra validations during updates and voids. You may also need to increase the memory for the Java VM, depending on the size of your input data.

4. Examine the screen output to be sure that the BulkLoader utility was able to connect to the appropriate database.

## Step 6: Review Feedback Information

After the BulkLoader utility completes an operation, review the feedback information in the `bulk_feedback` table that is located in your input data source. That table contains information about all the input items that BulkLoader processed.

After reviewing that information, take any corrective actions that might be necessary. If you modify any of your input data, you should run BulkLoader again to verify that the errors were corrected.

## Step 7: Approve and Publish the Assets to the Delivery System

Use the BulkApprover utility to approve the assets that you just loaded. For instructions on how to use BulkApprover, see “Using BulkApprover” on page 424.

## Importing Flex Assets Using a Custom Extraction Mechanism

Sometimes users need alternative mechanisms to provide input asset data to BulkLoader. In such cases, the data may have to be gathered from multiple types of sources, such as XML documents, files, and legacy databases. To accomplish that, users can implement their own mechanism to provide data to BulkLoader, using the Java interface `com.openmarket.bulkloader.interfaces.IDataExtract`, which FatWire provides with Content Server version 5.

A user can implement a Java object supporting `IDataExtract` and specify the Java object in the BulkLoader configuration file. BulkLoader will then invoke methods on this interface to initialize a read request, to repetitively read chunks of input data and then signal the end of the read request. This interface also has a method that provides import feedback from the BulkLoader utility, which can be used by the input provider to know the status of import and know any errors that may occur during import.

There are three Java interfaces that can help users with custom implementations of `IDataExtract`:

- `IDataExtract` – **Required** for any custom extraction.
- `IPopulateDataSlice` – Provides data to the BulkLoader utility. A container object supporting this interface is created by BulkLoader and passed into the client.
- `IFeedback` – Provides the status of each input item that has been processed by the BulkLoader. A feedback object that is created and populated by BulkLoader import thread is passed into the client.

These interfaces are described in the following sections.

### Note

When you implement a custom extraction method, you use the same previously described procedures to run BulkLoader.

## IDataExtract Interface

This interface is **required** for any custom extraction.

The following is sample code that implements this interface.

```
com.openmarket.gatorbulk.interfaces.IDataExtract

package com.openmarket.gatorbulk.interfaces;
import java.util.Iterator;

/**
 * To be implemented by input data provider.
 * Interface for extracting data from an input source
 * for BulkLoader.
 * BulkLoader loads an object supporting this interface and invokes
 * the GetNextInputDataSet() method on this interface repeatedly to
 * fetch data in batches.
 */
public interface IDataExtract {

    public final int HAS_DATA      = 100;
    public final int NO_DATA      = 101;

    public final int SUCCESS      = 0;
    public final int ERROR        = -1;

    public final int INSERT_ASSETS = 1000;
    public final int VOID_ASSETS   = 1010;
    public final int UPDATE_ASSETS = 1020;
    public final int NONE_ASSETS   = 1030;

    /**
     *Begin requesting input data; tells the client to
     *start the database query, get a cursor, etc.
     *@param requestType
     IDataExtract.INSERT_ASSETS, IDataExtract.VOID_ASSETS,
     IDataExtract.UPDATE_ASSETS
     *@param sliceOrNot true/false
     * true - if data will be requested in batches
     * false - data will be requested all in one attempt
     *@param sliceSize >0 number of rows to be
     *retrieved in one data set
     *@return none
     *@exception java.lang.Exception
     */
    public void InitRequestInputData(int requestType,
    boolean sliceOrNot, int sliceSize) throws Exception ;

    /**
     *Get a set/slice of input data records.
     *@param dataSlice object to be populated using the
```

```

    *methods from IPopulateDataSlice
    *@return IDataExtract.HAS_DATA when dataSlice has some data,
    *         IDataExtract.NO_DATA when there is no data,
    *         IDataExtract.ERROR when there is an error
    *@exception java.lang.Exception
    */
    public int GetNextInputDataSet(IPopulateDataSlice dataSlice)
    throws Exception;

    /**
    * Signal the end of extracting data for given request type
    *@param requestType
    IDataExtract.INSERT_ASSETS, IDataExtract.VOID_ASSETS,
    IDataExtract.UPDATE_ASSETS
    *@return none
    *@exception java.lang.Exception
    */
    public void EndRequestInputData(int requestType)
    throws Exception;

    /**
    *Update the client as to what happened to input data
    *processing. Note that this method would be called by multiple
    *threads, with each thread passing its own IFeedback
    *handle. The implementor of this method should write
    *thread-safe code.
    *@param requestType
    IDataExtract.InsertAsset, IDataExtract.VoidAsset, IDataExtract.UpdateAsset
    *@param processingStatus - An object containing processing
    *status for all items in one dataset. The implementor of this
    *interface should invoke the IFeedback interface
    *methods on processingStatus to get status for individual
    *rows. This method will be invoked by multiple BulkLoader
    *threads, so make sure this method is implemented in a
    *thread-safe way.
    *@return none
    *@exception java.lang.Exception
    */
    void UpdateStatus(int requestType, IFeedback
    processingStatus) throws Exception;
}

```

## Implementation Notes for IDataExtract

The Java object implementing `IDataExtract` needs to have a constructor with a string parameter. `BulkLoader` will pass the name of its configuration file to the constructor when instantiating this object.

The method `UpdateStatus(...)` is invoked by multiple `BulkLoader` threads, so the implementation of this method should be thread-safe.

The following table lists and describes the configuration parameters for the `BulkLoader` utility when using custom data extraction method:

Property Name	Required/Optional	Comments
<code>maxThreads</code>	Required	The maximum number of concurrent processing threads. This can be the number of database connections to the CSEE database server. Use as many threads as the number of CPUs on the database host. For a single CPU database host, set it to 2. Example: 4
<code>dataSliceSize</code>	Required	Number of items retrieved in one read request; this number will also be processed by a single processing thread. Example: 2000
<code>dataExtractionImplClass</code>	Required	User-specific Implementation class for data extraction API. Needs a constructor with <code>(String configFilename)</code> signature. The one mentioned here is a reference implementation class for backward compatibility. Data in flat tables. Default value ("out of the box"): <code>com.openmarket.gatorbulk.DataExtractImp</code>
<code>initId</code>	Required	Starting CSEE ID used the very first time <code>BulkLoader</code> operates; subsequently will use the value from <code>idSyncFile</code> . Example: 800000000000
<code>idSyncFile</code>	Required	Next available CSEE ID is saved in this file; updated during a <code>BulkLoader</code> session Example: <code>C:\FutureTense\BulkLoaderId.txt</code>
<code>idPoolSize</code>	Required	Each time <code>BulkLoader</code> needs to generate Content server IDs, it collects this many IDs and caches in memory. A good estimate is $(\text{number of assets} * \text{average number of attributes} * 2)$ . Example: 1000

Property Name	Required/ Optional	Comments
commitFrequency	Required	<p>Required.</p> <p>Specifies when "COMMIT" statements will be inserted into the generated SQL file. A value of 0 means that "COMMIT" statements will be inserted every 50 lines (the default); any positive integer specifies the number of lines between each "COMMIT" statement.</p> <p>For example:</p> <pre>commitFrequency=5</pre> <p>(A "COMMIT" statement will be inserted for every 5 lines of SQL code.)</p>
outputJdbcDriver	Required	<p>The name of the JDBC driver class to access the Content Server database. The value here reflects the Oracle 9.0 driver.</p> <p>Example:</p> <pre>oracle.jdbc.driver.OracleDriver</pre>
outputJdbcURL	Required	<p>The JDBC URL. The following example value is a typical type2 oracle JDBC driver URL:</p> <pre>Jdbc:oracle:oci8:@foo</pre>
outputJdbcUsername	Required	Content Server database user name
outputJdbcPassword	Required	Content Server database user password



## IPopulateDataSlice

The following is sample code that implements this interface:

```
com.openmarket.gatorbulk.interfaces.IPopulateDataSlice

package com.openmarket.gatorbulk.interfaces;

import java.sql.Timestamp;

/**
 *To be implemented by FatWire, inc.
 *Interface to populate a dataSlice by the client.
 *BulkLoader creates an object implementing this interface and then
 *hands it over to the client, which uses this interface's methods
 *to populate that object with input data records.
 */
public interface IPopulateDataSlice {

    /**
     *Creates a new input data object to hold all the data for a
     *flex asset and makes it the current object. This method is
     *invoked repetitively to populate this object with flex asset
     *input data. Each invocation is to be followed by Set..()
     *methods and AddAttribute..() methods to supply data for one
     *flex asset.
     *
     */
    public void AddNewRow();

    /**
     *Specify a unique identifier for flex asset input data
     *@param id user-specific unique identifier
     *@exception java.lang. Exception thrown if any unique-id
     *validation is enabled.
     */
    public void SetAssetUniqueId(String id) ;

    /**
     *Specify the name of the site with which the current flex
     *asset is created or to be created under.
     *@param sitename name of the site
     */
    public void SetSiteName(String sitename) ;

    /**
     *Set the asset type for the flex asset.
     *@param flexAssetType asset type as defined in CSEE system
     */
    public void SetFlexAssetType(String flexAssetType) ;

    /**
     *Specify the name of the parent for the current flex asset.
     *Use this method repeatedly to add a list of parent names.
```

```

        @param groupName name of a parent that the current asset
        inherits some of its attributes from.
    */
    public void AddParentGroup(String groupName) ;
    /**
     *Specify the name of the parent to be deleted for the current
     *flex asset.
     *Use this method repeatedly to add a list of parent names.
     *@param groupName - name of a parent that the current asset
     *inherited some of its attributes from.
     */
    public void AddParentGroupForDelete(String groupName);

    /**
     *Specify definition asset name for the current flex asset.
     *@param definitionAssetName name of the flex definition asset
     */
    public void SetDefinitionAssetName(String definitionAssetName)
    ;
    /**
     *Specify name of the flex asset.
     *@param name - name of the flex asset.Should be unique in
     *a flex asset family
     */
    public void SetAssetName(String name) ;
    /**
     *Specify description for the flex asset
     *@param description description
     */
    public void SetAssetDescription(String description) ;
    /**
     *Specify CSEE username with which this flex asset is being
     *processed
     *@param username CSEE username
     */
    public void SetCreatedByUserName(String userName) ;
    /**
     *Set CSEE status code for this asset
     *@param status
     */
    public void SetAssetStatus(String status) ;
    /**
     * Set template name
     *@param template CSEE template name
     */
    public void SetRenderTemplateName(String template) ;
    /**
     *Specify startMenu for workflow participation
     *@param startMenuName start menu name for this flex asset
     */
    public void SetStartMenuName(String startMenuName) ;
    /**

```

```

Content Server      *Specify publish approval target name
    *@param targetName approval target name
    */
public void SetApprovalTargetName(String targetName) ;
    /**
    *Add a name/value pair to specify a CSEE attribute of type
    *'text' for the current input object.
    *Call this method more than once, if this is a
    *multi-valued attribute.
    *@param attrName attribute name as defined in the CSEE
    *database for the flex asset being processed
    *@param value java.lang.String
    */
public void AddAttributeValueString(String attrName, String value)
;
    /**
    *Add a name/value pair to specify a CSEE attribute of type
    *'date' for the current input object.
    *Call this method more than once, if this is a
    *multi-valued attribute.
    *@param attrName attribute name as defined in the CSEE
    *database for the flex asset being processed
    *@param value java.sql.Timestamp
    */
public void AddAttributeValueDate(String attrName, Timestamp
value) ;
    /**
    *Add a name/value pair to specify an attribute for the current
    *input object.
    *Call this method more than once, if this is a multi-valued
    *attribute
    *@param attrName attribute name as defined in CSEE database
    *for the flex asset being processed
    *@param value java.lang.Double
    */
public void AddAttributeValueDouble(String attrName, Double
value) ;
    /**
    *Add a name/value pair to specify a CSEE attribute of type
    *'money' for the current input object
    *Call this method more than once if this is a
    *multi-valued attribute
    *@param attrName attribute name as defined in CSEE database
    *for the flex asset being processed
    *@param value java.lang.Float
    */
public void AddAttributeValueFloat(String attrName, Float value) ;
    /**
    *Add a name/value pair to specify a CSEE attribute of type
    *'int' for the current input object.
    *Call this method more than once, if this is a
    *multi-valued attribute.

```

```

    *@param attrName  attribute name as defined in CSEE
    *database for the flex asset being processed
    *@param value  java.lang.Integer
    */
public void AddAttributeValueInteger(String attrName, Integer
value) ;
    /**
    *Add a name/value pair to specify any CSEE attribute for the
    *current input object.
    *Use the datatype-specific methods above instead of this
    *method, as this one is for
    *supporting any other new types in future.
    *Call this method more than once, if this is a
    *multi-valued attribute
    *@param attrName  attribute name as defined in the CSEE
    *database for the flex asset being processed.
    *@param value  java.lang.Object
    */
public void AddAttributeValueObject(String attrName, Object
value) ;
}
```

## IFeedback Interface

The following is sample code that implements this interface:

```
com.openmarket.gatorbulk.interfaces.IFeedback

package com.openmarket.gatorbulk.interfaces;

import java.util.Iterator;

/**
 *To be implemented by FatWire, inc.
 *Interface for the BulkLoader client to get the status of
 *processing request to insert/void/update flex assets.
 */
public interface IFeedback {
    public final int ERROR=-1;
    public final int SUCCESS=0;
    public final int NOT_PROCESSED=1;
    /**
     *Get a list of keys from input data slice that has
     *been processed
     *@return java.util.Iterator
     */
    public Iterator GetInputDataKeyValList();
    /**
     * Get Content Server asset ID for given input identifier
     *@param inputDataKeyVal key value of the unique identifier
     *in the input data record
     *@return Get the associated asset ID from the CSEE system.
     *null if missing.
     */
    public String GetCseeAssetId(String inputDataKeyVal);
    /**
     *Get the processing status for the input data record
     *identified by a key
     *@param inputDataKeyVal key value of the unique identifier
     *column in the input data record
     *@return ERROR - processed but failed, SUCCESS - processed
     *successfully, NOT_PROCESSED - unknown item or not part of
     *the processing dataset.
     */
    public int GetStatus(String inputDataKeyVal);
    /**
     *Get the associated error message for a given key,
     *unique identifier in input data
     *@param inputDataKeyVal unique identifier for input data
     *@return error message, if GetStatus() returned ERROR
     *or NOT_PROCESSED
     */
    public String GetErrorDescription(String inputDataKeyVal);
}
```

## Approving Flex Assets with the BulkApprover Utility

BulkApprover is a utility that quickly and easily approves large numbers of flex assets that you have loaded into the system using BulkLoader.

BulkApprover can do the following tasks:

- Notify the approval system of all updates and deletions done during a previous BulkLoader session.
- Approve all newly loaded alex assets for one or more publishing targets.
- Mark all newly loaded flex assets as “published” for a given publishing target, without actually publishing them.

Note that only users with the `xceladmin` role can run BulkApprover.

### Creating a Configuration File

Before you run BulkApprover for the first time, you must create a configuration file for the utility. You can create a separate `BulkApprover.ini` file for this purpose, or you can append the BulkApprover configuration information to one of BulkLoader's `.ini` files.

The following table lists the configuration information that you must provide:

Parameter	Description
<code>bulkApprovalURL</code> (Required)	The URL on the host server that has the data imported with BulkLoader.  The correct value is as follows:  <code>http://myServer/cs/ContentServer?pagename=OpenMarket/Xcelerate/Actions/BulkApproval</code>  where <i>myServer</i> is the name of the host server.
<code>adminUserName</code> (Required)	The Content Server username of a user with the <code>xceladmin</code> role.
<code>adminUserPassword</code> (Required)	The password of a user with the <code>xceladmin</code> role password.
<code>approvalTargetList</code> (Required)	A list of the destinations that the assets are to be approved for. Separate each destination with the delimiter that you specify in the <code>multiValueDelimiter</code> parameter.  For the names of destinations, see the Publish option on the Admin tab, or the name column of the <code>pubtarget</code> table.  The syntax is:  <code>name1&lt;multiValueDelimiter&gt;name2&lt;multiValueDelimiter&gt;name3</code>
<code>multiValueDelimiter</code> (Required)	A delimiter that you select. You use this delimiter to separate the approval targets that you specify in the <code>approvalTargetList</code> parameter.

Parameter	Description
assetIdSqlFilter (Optional)	A statement that can be appended to a SQL WHERE clause in order to filter asset IDs.  For example: asset_id%20=0  or asset_id%20!=0
debug (Optional)	Turns BulkApprover's debugging on and off.  A value of true turns debugging on. Leave this parameter blank for no debugging.  Debug messages are written to the file specified in the output_file parameter of the command line.
assetschunksize (Required)	Specifies the number of assets that are approved in a single transaction. For example, setting this property to 20 means that the assets get approved in groups of 20.  Setting this property helps prevent session timeouts. There is no default value for this property.
outputJdbcDriver (Required)	The name of the JDBC driver class to access the Content Server database.  Example: oracle.jdbc.driver.OracleDriver
outputJdbcURL (Required)	The JDBC URL. The following example value is a typical type 2 oracle JDBC driver URL:  Jdbc:oracle:oci8:@foo
outputJdbcUsername (Required)	Content Server database user name
outputJdbcPassword (Required)	Content Server database user password

### Sample BulkApprover.ini File

The following sample shows the proper syntax of the BulkApprover configuration parameters:

```
bulkApprovalURL=http://MyServer/cs/
ContentServer?pagename=OpenMarket/Xcelerate/Actions/BulkApproval
adminUserName=admin
adminUserPassword=xceladmin
approvalTargetList=Dynamic;;;;;;;;testdest
multiValueDelimiter=;;;;;;;;
assetIdSqlFilter=
assetsChunkSize=3
debug=true
outputJdbcDriver=oracle.jdbc.driver.OracleDriver
outputJdbcURL=jdbc:oracle:thin:@19zln:1521:MyServer
```

```
#outputJdbcUsername=izod10
outputJdbcUsername=ftuser3
outputJdbcPassword=ftuser3
```

## Using BulkApprover

After you have configured and initialized the BulkApprover utility, you can use it to approve assets that you imported into the database using the BulkLoader utility.

BulkApprover accepts several parameters, which are described in the following table:

Parameter	Description
config	The name of the file where your BulkApprover configuration information is located; for example, BulkApprover.ini.
action	<p>The action or actions that you want BulkApprover to perform. When you want BulkApprover to perform multiple actions, supply the values in a comma-separated list.</p> <p>Note that none of these values are required.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> <li>• <code>notify</code> - Notifies the approval system about all updates and voids processed during a previous BulkLoader session.</li> <li>• <code>approve</code> - Tells BulkApprover to approve all of the assets that it processes for a given publishing destination(s).</li> <li>• <code>mark_publish</code> - Marks all of the assets that it processes as published on a given publishing destination(s), without actually publishing them.</li> </ul> <p>You specify the publishing targets using the <code>approvalTargetList</code> parameter found in the BulkApprover configuration file.</p> <p>If you do not want the assets marked as published, do not include this parameter.</p>
output_file	The name of the log file that contains all output from the server; for example, bulkapprover.txt.

BulkApprover runs from the command line. To run the utility, set the paths to gatorbulk.jar and cs.jar, as shown in the following example:

```
java -ms16m -mx64m -cp
Path_to_gatorbulk.jar;Path_to_cs.jar
com.openmarket.gatorbulk.objects.BulkApprover config=bulkapprove.ini
action=notify,approve,mark_publish output_file=bulkapprover.txt
```

When you use BulkApprover to approve flex assets that you have loaded using BulkLoader, you must supply at least the `notify` or `approve` value for the `action` parameter.



## Section 4

# Site Development

This section describes how to program your online site to deliver the data (assets) that you have designed.

It contains the following chapters:

- Chapter 19, “Creating Template, CSElement, and SiteEntry Assets”
- Chapter 20, “Creating Collection, Query, Stylesheet, and Page Assets”
- Chapter 21, “Coding Elements for Templates and CSElements”
- Chapter 22, “Template Element Examples for Basic Assets”
- Chapter 23, “User Management on the Delivery System”
- Chapter 24, “Commerce Integration”
- Chapter 25, “The HelloAssetWorld Sample Site”
- Chapter 26, “The Portal Sample Site”
- Chapter 27, “The Burlington Financial Sample Site”



## Chapter 19

# Creating Template, CSElement, and SiteEntry Assets

The CSElement, template, and SiteEntry asset types provide the pagelets and elements that build your online sites. They are asset representations of elements and page names, the components that Content Server uses to generate pages.

When you create a CSElement asset, you code an element. When you create a SiteEntry asset, you name a page. When you create a template, you do both: you code an element and you name a page.

This chapter describes these three asset types and provides information about how to create them. Additional information about coding templates and CSElements is included in Chapter 21, “Coding Elements for Templates and CSElements.”

This chapter contains the following sections:

- Pages, Pagelets, and Elements
- CSElement, Template, and SiteEntry Assets
- Creating CSElement Assets
- Creating Template Assets
- Managing Template, CSElement, and SiteEntry Assets
- Managing Template, CSElement, and SiteEntry Assets

## Pages, Pagelets, and Elements

In the Content Server context, an online page is the composition of several components into a viewable, final output. Creating that output is called **rendering**. (Making either that output or the content that is to be rendered available to the visitors on your public site is called publishing.)

Content Server renders pages by executing the code associated with page names. The name of a page—that is, a URL—is passed to Content Server from a browser and Content Server invokes the code associated with that page name. The code is actually a named file, a separate chunk of code called an element.

The code in your elements identify and then load assets to display in those pages or pagelets, and pass other page names and element names to Content Server. When Content Server invokes an element, all of the code in the element is executed. If there are calls to other elements, those elements are invoked in turn. Then the results—the images, articles, linksets, and so on, including any HTML tags—are rendered into HTML code (or some other output format if your system is configured to do so).

Template, CSElement, and SiteEntry assets represent elements and pagelets as follows:

- A CSElement asset is an element.
- A SiteEntry asset is a page or a pagelet.
- A template asset is both an element and a page or pagelet.

## Elements, Pagelets, and Caching

Pages and pagelets are cacheable. They have cache criteria set for them that determines whether they are cached and, if so, for how long.

Elements do not have cache criteria. When your code calls an element directly by name, without going through a page name, the output is displayed in the page that called the element's name and that output is cached as a part of that page.

If you want to cache the output from an element separately from the output of the page that called it, you must provide a page name for it and call it by its page name. The code in a template asset has a page name by default. To provide a page name for a CSElement asset, you create a SiteEntry asset and select the CSElement asset for it.

## Calling Pages and Elements

To see a Content Server page, you provide a URL that includes the name of the page. A Content Server URL looks like this:

- For WebLogic, WebSphere, and Sun ONE Application Server:  
`http://host:port/servlet/ContentServer?pagename=name_of_page`
- For iPlanet Application Server (iAS):  
`http://host:port/NASApp/cs/ContentServer?pagename=name_of_page`

Where *host* is the name of the server that is hosting the CSEE system, *port* is the port number of the web server, and *name\_of\_page* is the page name. This syntax passes the name of a page to the ContentServer servlet, which then renders the page.

For example, to see the home page of the Burlington Financial sample site, you enter:

```
http://host:port/servlet/
ContentServer?pagename=BurlingtonFinancial/Page/Home
```

When you code your elements, you use tags that programmatically call the pagelets and elements that you want to display in your site. These tags pass the names of pages and elements to the ContentServer servlet just as a URL entered in a browser passes a page name to the ContentServer servlet.

To call a page name, you use the `render:satellitepage` (`RENDER.SATELLITEPAGE`) tag. For example:

```
<render:satellitepage pagename="BurlingtonFinancial/Page/Home" />
```

To call an element directly by name, you use the `render:callelement` (`RENDER.CALLELEMENT`) tag. For example:

```
<render:callelement elementname="BurlingtonFinancial/Common/
TextOnlyLink" />
```

### Note

When you use CS-Explorer to examine SiteCatalog and ElementCatalog entries, they are presented as folders and subfolders that visually organize the pages and pagelets.

However, these entries are simply rows in a database table—there is no actual hierarchy. Therefore your code must always call a page entry or an element entry by its entire name. You cannot use a relative path.

How does your code call template, CSElement, and SiteEntry assets? As follows:

- Because a SiteEntry is a pagelet, you use the `render:satellitepage` tag to call SiteEntry assets from within your element code.
- Because a CSElement is an element, you use the `render:callelement` tag to call CSElement assets from within your element code.
- Because a template is both an element and a page name, you can use either tag although typically you call a template by its page name.

## Page vs. Pagelet

For the sake of clarity, the following table summarizes the various definitions of the word “page” as used in the documentation for Content Server and the CS content applications:

Term	Definition
pagelet	<p>The results of an HTTP request displayed in a browser as one piece of a rendered page. It has an associated element file.</p> <p>A pagelet is cached in the Content Server and CS-Satellite page caches.</p>

Term	Definition
page	<p>The results of an HTTP request displayed in a browser window. A page is created by compiling several parts of pages (pagelets) into one final, displayed or rendered page. It has an associated element file.</p> <p>A page is cached in the Content Server and CS-Satellite page caches.</p>
page name	The complete name of a page or pagelet. For example: BurlingtonFinancial/Article/Full.
page asset	<p>A site design asset that uses the basic asset data model. You create page assets and then place them in position on the Site tab in the Tree in the left pane of the Content Server interface. You associate other content and site design assets with them and then you publish them</p> <p>Page assets do <b>not</b> represent page names.</p>

## CSElement, Template, and SiteEntry Assets

As mentioned, CSElement assets are elements, SiteEntry assets are page names, and template assets are both.

Because page names and elements are assets, you can manage your code and page names in the same way you manage your content: you can use workflow, revision tracking, approval, and preview, as well as the Mirror to Server publishing method to move your code and page names to the management and delivery systems.

### Caution

Never use the revision tracking feature in the CS-Explorer tool to enable revision tracking directly on the SiteCatalog or ElementCatalog tables.

When you create a CSElement or template asset, you create an element. You can code the element by using the asset form (CSElement or template, depending on which type of asset you are creating) or by using the CS-Explorer utility.

It is preferable that you at least start coding the element in the asset form before continuing to code it in CS-Explorer. The Content Server interface will seed your element with stub code that sets compositional dependencies and, if you are using JSP, drops in the appropriate tag library directives for you. (Note that compositional dependencies are described in the section “About Dependencies” on page 470.)

If you edit an element in the CS-Explorer tool, be sure to open and save the template or CSElement in the Content Server interface so that the approval system knows that the asset was changed and can change its approval status, and so the CacheManager servlet can update the cache.

**Note**

If templates or CSElements refer to elements that are not associated with a template or CSElement asset, these elements are not automatically mirrored to the publishing destination. You must move them manually with the CatalogMover utility.

**Template Assets**

Templates create the look and feel of your online site and render other assets into pages and pagelets. You create a standard set of templates for each asset type—except CSElement and SiteEntry assets—so that all assets of the same type are formatted in the same way.

This process allows content providers to preview their content by selecting formatting code for it without requiring them to code themselves or allowing them to change your standard, approved code.

When you save a template asset, Content Server does the following:

- Creates a row in the `Template` table for the asset.
- If you have coded the element in the template form, creates an element entry in the `ElementCatalog` table. The name of the entry uses the following convention:

*AssetTypeName/TemplateName*

where:

- `AssetTypeName` is the asset type formatted by the template asset and element.
- `TemplateName` is the name of the template.
- Creates a page entry in the `SiteCatalog` table. The name of the page entry uses the following convention:

*SiteName/AssetTypeName/TemplateName*

where:

- `SiteName` is the name of the site that the template belongs to, which is the site that you were working in when you created the template. CS-Direct obtains this name from the `Publication` table. (In previous versions of the product, sites were called “publications.”)
- `AssetTypeName` is the asset type formatted by the template asset and. element
- `TemplateName` is the name of the template.

**Note**

Do not change the name of the page entry that CS-Direct creates.

## CSElement Assets

You use CSElement assets for the following kinds of things:

- Code that is not for rendering an asset and that you want to reuse in more than one place and/or call from more than one type of template. For example, you have six templates that use the same top banner so you create a CSElement asset for the code in the banner and call that element from each template. This way, if you decide to change the way the banner works, you only have to change it in one place.
- Recommendations for CS-Engage. If you create a dynamic list recommendation, you must create a CSElement asset to build the dynamic list. For more information, see Chapter 36, “Recommendation Assets.”

When you save a CSElement, Content Server does the following:

- Creates a row in the `CSElement` table for the asset.
- If you have coded the element in the CSElement form, creates an element entry in the `ElementCatalog` table. The name of the entry is the name that you entered into the **ElementCatalog Entry Name** field in the form.

## SiteEntry Assets

You use SiteEntry assets for the following kinds of things:

- If you are using the CS-Designer tool, you use SiteEntry assets to represent code snippets. In that interface, when you drag and drop a code snippet into a page, you are dropping in a Content Server call to a page entry through a `render:satellitepage` tag.
- When the code in a CSElement asset is rendered, it is displayed in the page that called it and is cached as part of that page (if that page is cached, that is). If you want the output from a CSElement to be cached as a separate pagelet and have its own cache criteria set for it (timeout value, page criteria values, and so on), your code must invoke that element through a page name. In such a case, you create a SiteEntry asset to accompany your CSElement asset.

When you create and save a SiteEntry asset, you associate a CSElement asset with it. The element in that CSElement asset becomes the root element for the SiteEntry's page entry.

When you save a SiteEntry asset, Content Server does the following:

- Creates a row in the `SiteEntry` table for the asset.
- Creates a page entry in the `SiteCatalog` table. The name of the page entry uses the following convention:

`SiteName/AssetTypeName/TemplateName`

The root element of the page entry is the element from the CSElement asset that you specified.

- Tracks an approval dependency between the SiteEntry asset and the CSElement asset. Both the SiteEntry asset and its CSElement asset must be approved before the SiteEntry asset can be published.



## What About Non-Asset Elements?

If you code customizations for the Content Server interface on the management system, you create elements that are not assets because you do not want them to be published to your delivery system.

For example, when you create workflow elements that implement actions or conditions, you do not create them as CSElement assets. In this case you use the CS-Explorer tool to manually create an entry in the `ElementCatalog` table.

Remember that if you create workflow or other custom elements on your delivery system, you must use the `CatalogMover` utility to copy those elements to the `ElementCatalog` on your management system.

## Creating CSElement Assets

When you create a CSElement asset, you do two things: you create an asset, and you code an element for the asset. The fields in the first part of the CSElement form describe the element as an asset. The rest of the fields provide information about the element file, information that is written to the `ElementCatalog` table, and provide an interface that you can use to code the element.

This procedure describes how you create the CSElement asset. For help with coding the element, see Chapter 21, “Coding Elements for Templates and CSElements.”

### Before You Begin

Before you begin, you must determine the naming convention that you want to use for your CSElement assets because you cannot change the names of an element after you save the asset.

### Step 1: Name and Describe the CSElement Asset

Complete the following steps:

1. If necessary, log in to the Content Server interface.
2. Click **New** on the button bar.
3. Select **CSElement** from the list of asset types. (The CSElement asset type must be enabled for your site and there must be a start menu item created for it.)

The CSElement form appears:

CSElement:

Cancel Save

---

\*Name:

Description:

---

\*ElementCatalog Entry Name:

Xml

Create Element? Jsp

Html

Element Catalog Entry Description:

Element Catalog Entry Storage Path/Filename:

Element Logic

Element Parameters:

Additional Element Parameters

Default Arguments for Preview:

-->
 X

Cancel Save

4. (Required) In the **Name** field, type a descriptive name for the CSElement asset. It's best to use a name that describes what the element does.
5. In the **Description** field, type a brief description of the CSElement asset. You can enter up to 128 characters.

## Step 2: Configure the Element

The rest of the fields in the CSElement form define the element entry in the `ElementCatalog` table and provide the code for the element file. You can use either this section of the form or the Content Server Explorer tool to actually code the CSElement.

You should use this form to begin coding your element because it seeds the element with standard stub code that you need to include in every one of your elements. CS-Direct adds JSP `taglib` statements (only if you are using JSP) and the `RENDER.LOGDEP` tag to the file by default so that the compositional dependency between this CSElement asset and pages that are rendered from this element is logged. When you use CS-Explorer to create a new element, it does not drop in the `taglib` statements for assets or log the compositional dependency.

This section describes how to use the CSElement form only; it does not describe how to code an element in CS-Explorer.

For information about dependencies, see “About Dependencies” on page 470.

### Option 1: Coding a New Element

If you are creating a new element, complete these steps:

1. In the **Create Element?** section, do one of the following:

- To create an .xml file, click **XML**.
- To create a .jsp file, click **JSP**
- To create an .html file, click **HTML**.

Content Server does the following:

- Enters header and other information in the **Element Logic** text entry area for you. For example, it sets the beginning and ending FTCS tags, and it sets a `RENDER.LOGDEP (render:logdep)` tag to mark a dependency between the CSElement asset and any page or pagelet rendered with the element.

If you clicked the **JSP** button, CS-Direct also sets a tag library directive for each of the CS-Direct JSP tag libraries (asset, siteplan, render).

- Enters a name for the element file in the **ElementCatalog Entry Name** field. It uses the name of the CSElement asset by default.
- Enters an upload file name for the element in the **ElementCatalog Entry Storage Path/Filename**. (This is the value of the `url` column in the element entry row in the `ElementCatalog` table).

It uses the name of the CSElement asset by default.

2. Click in the **ElementCatalog Entry Name** field and edit the text so that it represents the “location” in the `ElementCatalog` table that you want. Note that the value in this field is the name of the element. When you create code that calls this element (`RENDER.CALLELEMENT`), this is the name you should use.

Use **forward** slashes to delineate the folders in the `ElementCatalog` table. For example: `BurlingtonFinanical/Common/AlternateNavBar`. If the folders you specify do not yet exist in the `ElementCatalog` table, Content Server creates them when you save the CSElement asset.

3. Click in the **ElementCatalog Entry Storage Path/Filename** field and edit the text so that it matches the text that you entered in the **ElementCatalog Entry Name** field.

4. In the **ElementCatalog Entry Description** field, enter a description of the element. When you save the CSElement asset, the information in this field is written to the `description` column for the element entry in the `ElementCatalog` table.
5. In the **Element Logic** entry area, code your element. Be sure to enter all of your code before the ending `ftcs` tag.

If you are using JSP, be sure to remove the comments from the `taglib` directives that describe the tag families that you are using.

If you want, you can cut and paste code that you have already written. Or, you can use Content Server Explorer to continue coding this element **after** you **save** the asset. If you decide to use Content Server Explorer, complete the rest of the steps in this procedure first—before you use Content Server Explorer to open the element.

For help with this step, see Chapter 21, “Coding Elements for Templates and CSElements.”

6. (Optional) If your site design requires it, enter the appropriate arguments in the element parameter fields:
  - The **Element parameters** field corresponds to the `resdetails1` column for the element entry in the `ElementCatalog` table.
  - The **Additional element parameters** field corresponds to the `resdetails2` column for the element entry in the `ElementCatalog`.

These columns hold variables or arguments that can be passed to the element. If your site design requires that you use additional variables for your elements, enter them as name/value pairs with multiple arguments separated by the ampersand (&) character. For example:

```
MyArgument=value1&YourArgument=value2
```

By default, CS-Direct uses the `resdetails1` column to set the `eid` variable to the value of the CSElement asset's ID, but it does not use the `resdetails2` column.

#### Note

If you work with the element in CS-Explorer, be sure that you do not alter the value of the `eid` variable or accidentally delete it.

For more information about Content Server variables, including scope and precedence, see Chapter 3, “Programming with CSEE.”

7. For information about the **Default Arguments for Preview** field, see “Previewing Template, CSElement, and SiteEntry Assets” on page 449.

## Option 2: Selecting an Element that Already Exists

If you are creating a CSElement for an element that already exists, you just need to identify the element correctly and then CS-Direct can find it and associate it with this CSElement asset.

Finish creating the asset by completing the following steps:

1. In the **ElementCatalog Entry Description** field, type a description of the element. When you save the CSElement asset, the information in this field is written to the `description` column for the element entry in the `ElementCatalog` table.

2. Complete step 4 from “Option 1: Coding a New Element” on page 444.

When you save the CSElement asset, CS-Direct checks for the presence of an element with the correct name:

- If the element already exists, CS-Direct recognizes it and the next time you edit the CSElement, the code from the element is displayed in the **Element Logic** field.
- If the element does not yet exist, CS-Direct does nothing. When you inspect or edit the CSElement asset, CS-Direct displays a message stating that there is no root element in the form. As soon as you code the element and give it the correct name, CS-Direct detects it and associates it with the CSElement asset.

For help with coding your template elements, see Chapter 21, “Coding Elements for Templates and CSElements.”

### Step 3: Save and Inspect the CSElement

When you are finished creating the CSElement asset, click **Save**.

CS-Direct does the following:

- Creates a row in the CSElement table for the CSElement asset.
- Creates an entry in the ElementCatalog table using names specified in the form:
  - The value from the **ElementCatalog Entry Name** field is used to position the element file in the appropriate folder.
  - The value from the **ElementCatalog Entry Storage Path/Filename** field is written to the `url` column.
  - Additionally, CS-Direct sets the value of the `eid` variable to the ID of the CSElement asset in the `resdetails1` column.

- Displays the **Inspect** form.

For example:

CSElement: BurlingtonFinancial/Common/HeaderText	
 Preview	 <b>Inspect</b>  Edit  Delete <input type="text" value="more..."/>
<b>Name:</b>	BurlingtonFinancial/Common/HeaderText
<b>Description:</b>	Text-only page header
<b>Status:</b>	<a href="#">Created</a>
<b>ID:</b>	1026223170746
<b>ElementCatalog Entry Name:</b>	BurlingtonFinancial/Common/HeaderText
<b>ElementCatalog Description:</b>	Text-only page header
<b>Element Parameters:</b>	eid=1026223170746
<b>Additional element parameters:</b>	
<b>Element Logic:</b>	<pre> --&gt; &lt;?xml version="1.0" ?&gt; &lt;!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd"&gt; &lt;FTCS Version="1.1"&gt; &lt;!-- BurlingtonFinancial/Common/HeaderText -- -- INPUT -- -- OUTPUT -- --&gt; </pre>
<b>Default Arguments for Preview:</b>	<input type="button" value="View"/>
<b>Modified:</b>	Jul 9, 2002 11:25:01 AM by xceladmin

The **Inspect** form for a CSElement asset displays the following kinds of information:

- The standard summary information displayed for assets of all types (asset name, description, status, ID, source, and so on).
- The element entry information that you entered for the CSElement's element and that CS-Direct set for you (that is, the value of the eid variable).
- The code in the element itself.

## Creating SiteEntry Assets

When you create a SiteEntry asset, you are creating both an asset and a page entry in the SiteCatalog table. The fields in the first part of the form define the page entry as an asset. The rest of the fields provide information about the page entry as a Content Server page, information that is written to the SiteCatalog table.

Before you begin, complete the following tasks:

- A root element is required for any page entry. When you create a SiteEntry asset, you select a CSElement asset to represent the root element. Be sure to create the appropriate CSElement assets before you begin.

- You specify the CSElement for your SiteEntry assets by selecting them from a tree tab. Be sure to make your CSElement assets available from the tree before you begin.
- Determine the naming conventions that you want to use because you cannot change the name of a page entry after you save a SiteEntry asset.

To create a SiteEntry asset, complete the following steps:

1. If necessary, log in to the Content Server interface.
2. Click **New** on the button bar.
3. Select **SiteEntry** from the list of asset types. (The SiteEntry asset type must be enabled for your site and there must be a start menu item created for it.)

The SiteEntry form appears:

The screenshot shows the 'SiteEntry' form with the following fields and controls:

- Buttons:** 'Cancel' and 'Save' at the top and bottom.
- \*Name:** A text input field.
- Description:** A text input field with a small 'v' icon on the right.
- \*SiteCatalog Pagename:** A text input field.
- Rootelement:** A text input field with a dropdown arrow on the right and an 'Add Selected Items' button.
- Pagelet Cache Info:** A text input field containing 'true,\*'.
- Access Control Lists:** A text input field.
- Page-level parameters:** A text input field.
- Additional Page-level parameters:** A text input field.
- Default Arguments for Preview:** A section with two text input fields: '[ContentDetails:]' and '[Value]', and a button with '-->' and 'X'.

4. (Required) In the **Name** field, type a descriptive name for the SiteEntry asset. It's best to use a name that describes what the page is for.
5. In the **Description** field, type a brief description of the SiteEntry asset. You can enter up to 128 characters.
6. Click in the **SiteCatalog Pagename** field and edit the text so that it represents the page name that you want stored in the SiteCatalog table. Note that the value in this field is the name of the page entry. When you create code that calls this SiteEntry asset (RENDER.SATELLITEPAGE), this is the name you should use.

Use **forward** slashes to delineate the folders in the SiteCatalog table. For example: BurlingtonFinanical/Common/AlternateNavBar. If the folders you specify do not yet exist in the SiteCatalog table, Content Server creates them when you save the SiteEntry asset.

7. For the **Rootelement** field, select the appropriate CSElement asset from the tree and click the **Add Selected Items**.

8. The **Pagelet Cache Info** field corresponds to the `cacheinfo` column in the `SiteCatalog` table. When you save the asset without entering information in this field, the default value is set to:

```
true,*
```

This means means that the pagelet rendered by this `SiteEntry` asset's root element will be cached and the timeout value is set to the value of the `cs.pageCacheTimeout` property in the `futuretense.ini` file.

To override these settings for the page entry for this `SiteEntry` asset, click in the field and enter the new values. For example, to turn caching off for this pagelet, type `false` in the field. To override the default timeout value for this pagelet, type `true,n` where *n* is the number of minutes the item should be kept in the cache before expiring.

For more information about page caching settings, see Chapter 4, "Page Design and Caching."

9. (Optional) The **Access Control Lists** field corresponds to the `acl` column in the `SiteCatalog` table. If you want to restrict the visitors who can request this page, enter the ACLs that visitors must have in order to see the page. (For more information about ACLs, see Chapter 23, "User Management on the Delivery System.")
10. (Optional) There are two columns in the `SiteEntry` table that hold variables that can be passed to Content Server with a page name:
- The **Page-level parameters** field corresponds to the `resargs1` column for the element entry in the `SiteCatalog` table.
  - The **Additional page-level parameters** field corresponds to the `resarg2` column for the element entry in the `ElementCatalog`.

By default, CS-Direct uses the `resargs1` column to set the `seid` variable to the value of the `SiteEntry` asset's object ID and to set the `rendermode` variable as a `PageCriteria` variable.

The caching system uses only those variables that are specified as `PageCriteria` variables to create the `cachekey` for cached pages. Therefore, if your site design requires that you use additional page-level variables, be sure to designate them as `PageCriteria` variables.

Use one of these fields, but not both. And no matter which field you choose, include the CS-Direct `rendermode` variable in your statement because your value will overwrite the values that CS-Direct enters.

For example:

```
PageCriteria=rendermode,MyArgument,YourArgument&MyArgument=xxxx
&YourArgument=yyyy
```

For more information about Content Server variables, including scope and precedence, see Chapter 3, "Programming with CSEE."

11. For information about the **Default Arguments for Preview** field, see "Previewing Template, CSElement, and SiteEntry Assets" on page 449.
12. Click **Save**.



## Creating Template Assets

When you create a template asset, you create it for a specific asset type. You provide formatting code for assets of that type and you can specify caching and other criteria for Content Server to use when rendering an asset that uses the template.

The procedure in this section describes the basic steps of creating and saving a template asset. Coding samples and other information about coding templates for specific asset types follows in Chapter 21, “Coding Elements for Templates and CSElements.”

### Step 1: Name and Describe the Template Asset

Complete the following steps:

1. If necessary, log in to the Content Server interface.
2. Click **New** on the button bar.
3. Select **Template** from the list of asset types. (The template asset type must be enabled for your site and there must be a start menu item created for it.)

The first **Template** form appears:

**Template:**

---


\*Name:

\*For Asset Type:

---

4. (Required) In the **Name** field, type a descriptive name for the template that is unique for the type of asset that it formats. You can enter up to 64 alphanumeric characters, but the first character must be a letter. Underscores (\_), hyphens (-), and spaces are accepted.
5. (Required) Click in the **For Asset Type** field and select the asset type that this template formats. For example, if you are creating an article asset template, select **Article** from the drop-down list.

6. Click **Continue**. The following form appears:

Template: test2 

---

---

\*Name: test2  
 Description:

---

Source: HelloAssetWorld  
 Category: Subpage Template

---

For Asset Type: Article  
 Applies to subtypes:

---

Keywords:

---

Pagelet Cache Info: true,\*

---

Access Control Lists:

---

Page-level parameters:

---

Create Template Element?

---

Template Element Description:

---

Template Element Storage Path/Filename:

---

Template Element Logic

---

Element Parameters:

---

Additional Element Parameters

---

The top part of the form describes the template as an asset.

7. In the **Description** field, type a brief description of the template. You can enter up to 128 characters.

8. If you are using the **Source** field, select a source from the drop-down list.
9. If you are using the **Category** field, select a category from the drop-down list.
10. If this template should be used only for specific subtypes of the asset type that you selected in **For Asset Type** field in step 5, select the appropriate subtypes in the **Applies to Subtypes** field.
11. In the **Keywords** field, enter keywords that you and others can use as search criteria in the **Advanced Search** form when you search for this template in the future. For information about searching for assets, see the *CSEE User's Guide*.

## Step 2: Configure the Page Name

The next three fields define the page entry in the `SiteCatalog` table for the template asset:

1. (Optional) The **Pagelet Cache Info** field corresponds to the `cacheinfo` column in the `SiteCatalog` table. When you save the asset without entering information in this field, the default value is set to:

```
true,*
```

This means means that the pagelet rendered by this template's element will be cached and the timeout value is set to the value of the `cs.pageCacheTimeout` property in the `futuretense.ini` file.

To override these settings for the page entry for this template, click in the field and enter the new values. For example, to turn caching off for this pagelet, type `false` in the field. To override the default timeout value for this pagelet, type `true,n` where *n* is the number of minutes the item should be kept in the cache before expiring.

For more information about page caching settings, see Chapter 4, "Page Design and Caching."

2. (Optional) The **Access Control Lists** field corresponds to the `acl` column in the `SiteCatalog` table. If you want to restrict the visitors who can request this page, enter the ACLs that visitors must have in order to see the page. (For more information about ACLs, see Chapter 23, "User Management on the Delivery System.")
3. (Optional) The **Page Level Parameters** field corresponds to the `resargs2` column in the `SiteCatalog` table, a column that holds variables (arguments) that can be passed to the ContentServer with a page name. When you save the template, CS-Direct sets the following variables as PageCriteria variables in the `resargs1` column: `c`, `cid`, `p`, and `rendermode`. (For information about these variables, see Chapter 3, "Programming with CSEE.")

The caching system uses only those variables that are specified as as PageCriteria variables to create the cachekey for cached pages. Therefore, if your site design requires that you use additional page-level variables, be sure to designate them as PageCriteria variables. Because the variables entered in this field (`resars2` column) overwrite the variables that CS-Direct sets in the `resargs1` column, you must include the CS-Direct variables in your statement.

For example, say that you want to include a variable named `foo` as a PageCriteria variable. In this case, you would enter the following string in this field:

```
PageCriteria=c,cid,p,rendermode,foo
```

## Step 3: Configure the Element

The rest of the fields in the template form define the element entry in the `ElementCatalog` table. You can use either this section of the form or the Content Server Explorer tool to actually code the template. For help with coding the element, see Chapter 21, “Coding Elements for Templates and CSElements.”

When you use this section of the form to code or to start coding the element, CS-Direct adds `JSP taglib` statements (only if you are using JSP) and the `RENDER.LOGDEP` tag to the file by default so that the compositional dependency between this template asset and pages that are rendered from this element is logged. For information about dependencies, see “About Dependencies” on page 470.

### Option 1: Coding a New Element

If you are creating a new element for a new template asset, complete these steps:

1. In the **Create Template Element?** section, do one of the following:

- To create an .xml file, click **XML**.
- To create a .jsp file, click **JSP**
- To create an .html file, click **HTML**.

CS-Direct does the following:

- Enters header and other information in the **Template Element Logic** text entry area for you.

For example, it sets a `RENDER.LOGDEP (render:logdep)` tag to mark a dependency between the template asset and any page or pagelet rendered with the template.

If you clicked the **JSP** button, CS-Direct enters a tag library directive for each of the CS-Direct JSP tag libraries.

- Enters an upload file name for the element in the **Template Element Storage Path/Filename**. (This is the value of the `url` column in the element entry row in the `ElementCatalog` table).

CS-Direct uses the `AssetTypeName/TemplateName` naming convention.

For example, if you named the template `Summary` and the asset type is `article`, the upload file name for the template element is called `Article/Summary` in the `ElementCatalog` table.

2. (Optional) In the **Template Element Description** field, enter a description of the template. When you save the template asset, the information in this field is written to the `description` column for the element entry in the `ElementCatalog` table.

3. In the **Template Element Logic** entry area, code your element. If you are using JSP, be sure to remove the comments from the `taglib` directives that describe the tag libraries that you are using.

If you want, you can cut and paste code that you have already written. Or, you can use Content Server Explorer to continue coding this template **after** you have **saved** the asset. If you decide to use Content Server Explorer, complete the rest of the steps in this procedure first, before you use Content Server Explorer to open the element.

For help with this step, see Chapter 21, “Coding Elements for Templates and CSElements.”

4. The **Element parameters** field corresponds to the `resdetails1` column and the **Additional element parameters** field corresponds to the `resdetails2` column for the element entry in the `ElementCatalog`. These columns hold variables or arguments that can be passed to the element.

When you save the asset, CS-Direct sets a value for the `tid` variable in `resdetails1`. If your site design requires that you use additional variables for your template elements, enter them in these fields. For more information about using variables, see Chapter 3, “Programming with CSEE.”

## Option 2: Selecting an Element that Already Exists

If you are creating a template asset for an element that already exists, you just need to identify the element correctly and then CS-Direct can find it and associate it with this template asset.

As long as you use the proper naming convention for your template element—*AssetTypeName/TemplateName*—CS-Direct can find it and associate it with the appropriate template.

Complete the following steps:

1. (Optional) In the **Template Element Description** field, type a description of the template.
2. Complete step 4 from “Option 1: Coding a New Element” on page 444.

When you save the template asset, CS-Direct checks for the presence of an element with the correct name:

- If the element already exists, CS-Direct recognizes it and the next time you edit the template, the code from the element is displayed in the **Template Element Logic** field.
- If the element does not yet exist, CS-Direct does nothing. When you inspect or edit the template asset, CS-Direct displays a message stating that there is no root element in the form. As soon as you code the element and give it the correct name, CS-Direct detects it and associates it with the template.

For help with coding your template elements, see Chapter 21, “Coding Elements for Templates and CSElements.”

## Step 4: Save and Inspect the Template

When you are finished creating the template asset, click **Save**.

CS-Direct does the following:

- Creates a row in the `Template` table for the template asset.
- Determines the name of the site that the template belongs to.
- Creates a page entry in the `SiteCatalog` table using the *SiteName/AssetTypeName/TemplateName* naming convention. When you create code that calls this template asset (`render:satellitepage`), this is the page name name that you use.
- Sets the name of the root element of the new `SiteCatalog` page entry to the name of the `ElementCatalog` entry (or to what it expects will be the name of the root element).

- Creates an entry in the ElementCatalog table using the *AssetTypeName/TemplateName* naming convention. If the element was coded in the template form, it also creates the element file.
- Displays the **Inspect** form.

For example:

Template: FrenchVersion	
Inspect    Edit    Delete <input type="text" value="more..."/> Add to My Active List	
<b>Name:</b>	FrenchVersion
<b>Description:</b>	Formats the French version of an article.
<b>Status:</b>	<u>Edited</u>
<b>Source:</b>	Burlington Financial
<b>ID:</b>	1012950138609
<b>Category:</b>	Subpage Template
<b>Rootelement:</b>	Article/FrenchVersion
<b>SiteCatalog Pagename:</b>	BurlingtonFinancial/Article/FrenchVersion
<b>Csstatus:</b>	live
<b>Page-level parameters:</b>	c=Article&PageCriteria=c,cid,p,rendermode&rendermode=live&tid=1012950138609
<b>Additional Page-level parameters:</b>	
<b>Pagelet Cache Criteria:</b>	cs.pgcachefolder,*
<b>Access Control Lists:</b>	
<b>ElementCatalog Description:</b>	French version of an article
<b>Element parameters:</b>	
<b>Additional element parameters:</b>	<pre> &lt;?xml version="1.0" ?&gt; &lt;!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd"&gt; &lt;FTCS Version="1.1"&gt; &lt;!-- Article/FrenchVersion - - INPUT - </pre>

The **Inspect** form for a template asset displays the following kinds of information:

- The standard summary information displayed for assets of all types (asset name, description, status, ID, source, and so on).
- The page entry and element entry information that you entered for the template and its element.
- The following additional information from the page entry in the SiteCatalog table information that you are not allowed to edit from the template form:
  - The value from *csstatus*, a SiteCatalog column that determines whether the page can be viewed in a browser. CS-Direct sets *csstatus* to *live*, which indicates yes.
  - The value from *resargs1*, the SiteCatalog column that holds the default variables that CS-Direct sets for each template.

For all template assets, the first part of this statement is

PageCriteria=cid,ct,p,rendermode&rendermode=live

Additionally, CS-Direct sets the value for *c* and *tid* for the template. The *tid* variable is set to the ID of the template asset. The *c* variable is set to the value of the asset type selected for the template

For example, if the template asset is for article assets and its ID is 1012950138609, the `resargs1` column is set to:

```
PageCriteria=c,cid,ct,p,rendermode&rendermode=live&
c=Article&tid=1012950138609
```

For more information about these variables, see Chapter 3, “Programming with CSEE.”

- The code in the template’s element.

If you have shared the template asset, the **Inspect** form also lists all of the additional page entries in the `SiteCatalog` for this template asset—there is a page entry for each site that the template is shared with.

## Managing Template, CSElement, and SiteEntry Assets

This section presents additional procedures for working with template, CSElement, and SiteEntry assets:

- Designating Default Approval Templates (Export to Disk Only)
- Editing Template, CSElement, and SiteEntry Assets
- Sharing Template, CSElement, and SiteEntry Assets
- Deleting Template, CSElement, and SiteEntry Assets
- Previewing Template, CSElement, and SiteEntry Assets

### Designating Default Approval Templates (Export to Disk Only)

When assets are approved for a publishing destination that uses the Export to Disk publishing method, the approval system examines the template assigned to the asset to determine its dependencies.

If you design your online site to render assets with more than one template (a text-only version and a summary version and a full version for the same type of asset, for example), you should create a template that contains a representative set of approval dependencies for all of the templates, and then specify that template as the Default Approval Template for the asset type.

For more information about approval templates, see “Approval Templates for Export to Disk” on page 472. For an example of a template that could be used as a default approval template, see the Burlington Financial template for article assets named Full.

To designate that a template is the default approval template:

1. On the **Admin** tab, select **Publishing > Destinations > Static**.
2. Under the name of a static destination, select **Set Default Templates**.
3. In the **Default Templates** form, click **Edit**.
4. In the edit form, select a default template for each asset type. If you are using the Subtype feature for any of your asset types, you can designate a default approval template for each subtype of that asset type. (For information about subtypes, see “Step 7: (Optional) Configure Subtypes” on page 280).

5. When you are finished, click **Save**.

## Editing Template, CSElement, and SiteEntry Assets

Creating a template, CSElement, and SiteEntry assets also creates entries in the SiteCatalog and/or ElementCatalog tables. The names of those entries are based on the asset's name, and for template assets, the asset type, and the site the template belongs to. Because these naming dependencies exist, the following restrictions apply when you edit templates, CSElements, or SiteEntry assets:

- You cannot rename a template, CSElement, or SiteEntry asset after it has been saved.
- For templates, you cannot change the asset type selected in the **Asset Type** field after the template asset has been saved.
- For templates and CSElements, you cannot change the name of the root element.
- For SiteEntries, you cannot change the name of the page entry.

### Note

You also cannot change the name of a site after it is created.

For the basic procedure for editing assets, see the *CSEE User's Guide*.

## Sharing Template, CSElement, and SiteEntry Assets

When you share a CSElement, template, or SiteEntry asset, Content Server creates a row in the AssetPublication table for each site that you share the asset with.

Additionally, for **template assets only**, CS-Direct does the following:

- Creates a new SiteCatalog page entry for each site that you share the asset with. It uses the name of the site in the name of the page entry. All of the new page entries point to the same root element, the template element.

### Note

Do not change the root elements of these page entries. All page entries for a shared template must point to the same root element.

- Lists all the other page entries for the shared template that share this root element in the **Inspect** form.

For the basic procedure for sharing assets, see the *CSEE User's Guide*.

## Deleting Template, CSElement, and SiteEntry Assets

CS-Direct does not allow you to delete an asset if there is another asset using it. However, it does not check to see whether a template or CSElement is referenced by the code in other template or CSElement elements.

Before you delete a template or SiteEntry asset, be sure to remove any page calls to that asset's page entry from your elements. Before you delete a CSElement asset, be sure to remove any element calls to that asset's root element from your other elements.



When you delete an asset, CS-Direct does the following:

- Changes the value of the asset's name column in the `Template`, `CSElement`, or `SiteEntry` table (depending on the asset type) to its object ID.
- Changes the value of the asset's status column in the `Template` table to `VO`, for "void".
- For templates, deletes all the `SiteCatalog` table entries (if the template is shared, there are as many page entries as there are sites that the template is shared with) and the `ElementCatalog` table entry for the template.
- For CSElements, deletes the `ElementCatalog` table entry for the asset.

For the basic procedure for deleting assets, see the *CSEE User's Guide*.

## Previewing Template, CSElement, and SiteEntry Assets

Because template, CSElement, and SiteEntry assets provide logic and code for formatting other assets, you preview assets of these types differently than you preview your content assets.

### Templates and Preview

When you preview a template, you preview it in the context of an asset. You preview the asset and select the template that you want to use to render the asset. Content Server invokes the code in the template and renders a page with the asset as the content.

### CSElement and SiteEntry Assets and Preview

You preview CSElement and SiteEntry assets directly. If the element that will be called has self-contained context—a banner that does not expect variables or arguments, for example—you can simply click the Preview icon. But when the results of the rendered element will depend on values that are passed to it, you must manually set those values in the CSElement or SiteEntry form in order to preview that asset.

For example, the Burlington Financial CSElement asset named `BurlingtonFinancial/Query/ShowHotTopics` expects a value for the `p` variable. If it doesn't receive one, the value of `p` defaults to the object ID of the Home page asset. If you want to preview this CSElement for a page asset other than the Home page, you must pass in the ID of that page asset as the value of the `p` variable with the argument fields in the New or Edit form for that CSElement asset.

To specify argument values for previewing CSElement or SiteEntry assets, complete the following steps:

1. Find the asset and inspect it (click the icon with the letter "i").
2. Scroll to the bottom of the status form. Next to the **Default Arguments for Preview** field, click **View**.

This is the form that appears for a CSElement asset:

**Inspect a CSElement asset with your own arguments**

Name:	BurlingtonFinancial/Common/SiteBanner		
Description:	The BF Site banner		
ElementCatalog Entry Name:	BurlingtonFinancial/Common/SiteBanner		
Default Arguments for Inspect:	<input type="text" value="[ContentDetails:]"/> <input type="button" value="--&gt;"/>	<input type="text" value="[Value]"/> <input type="button" value="X"/>	

Modify default argument data shown above;  
then click the Render button to render  
this page.

3. Click in the top field next to the words **Default Arguments for Inspect** and enter the name of the argument or variable.
4. Click in the lower field and enter the value for the argument or variable that you specified.
5. Click the arrow button.  
The name/value pair is moved to the text box on the right.
6. Repeat steps 3 through 5 for each argument that your asset needs a value for in order to preview it.
7. Click **Render** to preview the asset.

Note that you can provide and save preview arguments for your SiteEntry and CSElement assets with the **Default preview arguments** field in their **New** and **Edit** forms.

## Chapter 20

# Creating Collection, Query, Stylesheet, and Page Assets

The core asset types delivered with CS-Direct provide basic site design logic. This chapter describes how to create the page, query, and collection assets that implement the functionality of your online site. It also includes a section for the stylesheet asset type, a sample asset type delivered with the Burlington Financial sample site.

The preceding chapter describes how to create template assets. Because you assign template assets to your other assets, it is typical to create your templates before you create your site design asset types.

The procedures for working with assets of any type are very similar and are described thoroughly in the *CSEE User's Guide*. This chapter presents procedures that are unique for the page, collection, query, and stylesheet asset types. It contains the following sections:

- Previewing Assets
- Approving Assets
- Sharing Assets
- Deleting Assets
- Collection Assets
- Query Assets
- Stylesheet Assets
- Page Assets

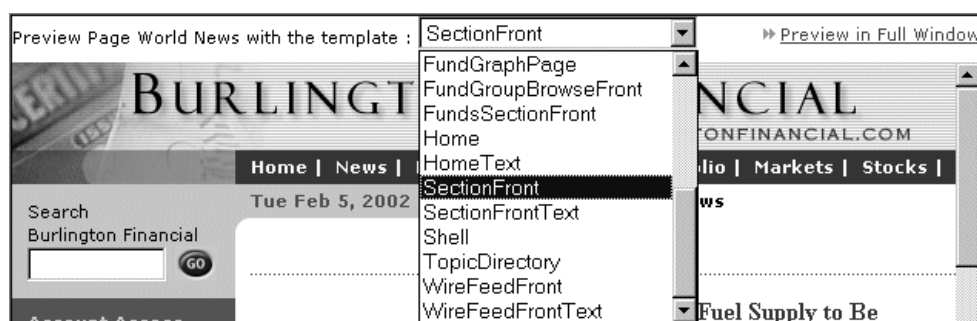
## Previewing Assets

You can preview any asset that has a template asset selected in its **Template** field. The preview feature also lets you select other templates to use to preview the same asset.

To preview an asset, do one of the following:

- Right-click on the asset in the tree view on the **Site Plan** tab, and select **Preview** from the pop-up menu.
- Inspect or edit the asset in the work area, and click the **Preview** icon.
- Search for a list of assets, and click the **Preview** button next to an asset in the list of search results.

CS-Direct renders the asset and displays it in a new browser window, using the template you have assigned as the default format. To preview the asset with a template other than its default template, select the template that you want to use from the drop-down list of templates displayed in the browser, as shown here:



### Note

Depending on how your templates are written, some of them may not display your asset correctly in the context of the management system.

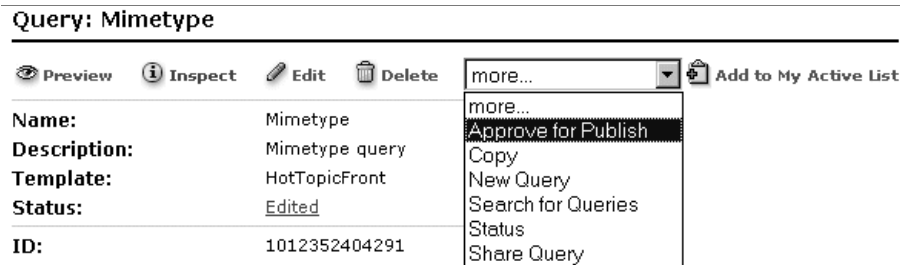
## Approving Assets

The publishing process that either copies assets from one system to another system (Mirror to Server) or renders assets into static files (Export to Disk) is a background process that is typically configured to run at regularly scheduled times. The publishing process publishes only those assets that have been **approved**.

When you approve an asset, the approval system examines the asset to determine if it has any dependencies on other assets. For example, if the assets in an approved collection are not approved, the collection cannot be published.

Depending on how your development and management systems are set up, approving assets for publish might be a workflow step—typically the last workflow step in a workflow process. For more information about approvals and publishing, see the *CSEE Administrator's Guide*.

To approve an asset for publish, you select **Approve for Publish** from the drop-down list in the **Inspect** or **Status** form for the asset, as shown here:



If there is more than one publishing destination set up, you then must select which publishing destination the asset is approved for.

## Sharing Assets

If you want to use your assets in more than one site, you can share them so you do not have to create and maintain the same asset more than once.

Before you share an asset, consider the following tips:

- You can share an asset only to sites that you have access to. If you have access to only one site, the **Share Assets** function is not available to you.
- You cannot share page assets.
- Share an asset only if it really is identical; that is, do not share an asset if you need to make any modifications for one of the sites it is shared with. In that case, create a new asset for the site that needs the modifications.
- Be sure that the template assets assigned to shared assets are appropriate. The template asset itself must be shared. Otherwise, you will be unable to preview the asset on the site you share it with.
- If the asset has a workflow assigned to it, you and others can change its workflow status only when you are working in the asset's original site.
- It is good practice to share the asset only when you are ready to publish it; that is, to not share the asset until it has been approved. There is a workflow privilege called **Share Assets**, which means that your site administrator can set up a workflow that enforces this practice.

For the basic procedure for sharing assets, see the *CSEE User's Guide*.

## Deleting Assets

The **Delete** function does not actually remove an asset from the database. A better description is that it marks it as deleted.

When you delete an asset, CS-Direct does the following:

- Changes the value of the asset's Name column in its main storage table to its object ID.
- Changes the value of the asset's Status column to VO, for "void."
- Approves the asset for publishing to any destination it has ever been published to.

The following restrictions are enforced when you delete assets:

- You can delete an asset only if you have the privileges to do so.
- Even if you have the ability to delete assets, you cannot delete an asset that is assigned to someone other than you if you are using the workflow feature.
- You cannot delete an asset if it has associations with other assets. For example, you cannot delete an article if it is included in a collection. You must remove the article from the collection before you can delete the article. (CS-Direct displays information about an asset's associations when this situation occurs.)

For the basic procedure for deleting assets, see the *CSEE User's Guide*.

## Collection Assets

A collection asset stores an ordered list of assets of one type. You **create** (or design) a collection asset by naming it and selecting query assets for it. By default, you can select up to three query assets. If your site design requires more queries for collection assets, you can create additional named associations for the additional queries. For information about creating associations, see “Step 8: (Optional) Configure Association Fields” on page 281.

A collection uses a query asset to obtain a list of possible assets for the collection. You **build** (or populate) a collection by running its queries, selecting assets from the results of the queries, and then ranking and ordering the assets that you selected. This ranked, ordered list is the collection.

Using collections is one way to keep the content displayed on rendered pages current and up-to-date. The Burlington Financial sample site uses several collections. For example, you can select a collection in the Top Stories field for a Burlington Financial page asset. A publisher or content provider can then change the content identified by that association by doing one of the following:

- Selecting a different collection from the tree
- Building the assigned collection and selecting different assets in it

## Before You Begin

Before you **create** collection assets, note the following:

- A collection must have at least one query, so be sure that you create the queries before you try to create your collections.
- Because you assign templates to collections, you should also create the template assets before you create your collection assets.

Before you **build** the collection, you should determine how the template asset assigned to it is coded. For example, if you select ten assets for a collection but the template is coded to display only five of them, the following occurs:

- The rendered page that displays those assets displays only the first five.
- The page takes longer to render than necessary because CS-Direct has to sort through all ten assets even though it displays only the first five.

For more information about building a collection, see the *CSEE User's Guide*.

## Creating Collection Assets

To create a collection asset:

1. If necessary, log in to the Content Server interface.
2. Click **New** on the button bar.
3. Select **Collection** from the list of asset types. (Collection asset types must be enabled for your site.)

The **Collection** form appears:

4. (Required) In the **Name** field, type a unique, descriptive name for the page. You can enter up to 64 alphanumeric characters, but the first character must be a letter. Underscores (\_) and hyphens (-) are acceptable, but tab and space characters are not.  
The name must be unique for page assets you are creating for this site.
5. In the **Description** field, type a brief description of the page. You can enter up to 128 characters.
6. In the **Template** field, select a template asset from the drop-down list.
7. In the **Category** field, select a category from the drop-down list. (If you do not select a category, the first item on the list is selected by default.)
8. In the **Keywords** field, enter keywords that you and others can use as search criteria in the **Advanced Search** form when you search for this template in the future. For information about searching for assets, see the *CSEE User's Guide*.
9. In the **Associated queries** section, select up to three queries. All of the queries that you select for this collection must return assets of the same type.
10. Click **Save**.

## Sharing Collection Assets

Before you share a collection asset, consider the following:

- Building a collection in one site builds it in all of the sites that it is shared with. You cannot build a collection to include different assets for different sites.
- The query assets used in the shared collection must be coded to return only assets that are shared to all the sites that the collection is shared with.
- As with any shared asset, be sure that the template assigned to the collection is also shared to the other site.

For the basic procedure for sharing assets, see the *CSEE User's Guide*.

## Query Assets

A query asset stores a database query that retrieves a list of other assets from the database. However, if the query is to be used for a collection, it can return assets of one type only.

### Query Assets and Other Assets

CS-Direct uses queries differently in collection assets than it does for other assets:

- When you build (or populate) a collection, you run one or more query assets and then select and order the assets that you want from the resulting list. The collection is a **static** list of assets selected from the query resultsets.
- You can select queries for a page asset either through informal relationships or through named associations. You can select queries for other asset types (article, for example) through named associations.

When the asset is rendered, it does not invoke the query directly. Either the template element that formats the asset or a template element that formats the query is coded to invoke a standard CS-Direct element called:

`OpenMarket/Xcelerate/AssetType/Query/ExecuteQuery`

This element runs the query asset when the asset it is associated with is rendered, which means the resultset is **dynamic**.

### How the Query Is Stored

A query asset can store its database query in one of two ways:

- Directly. You can write the query directly into the **SQL query** field of the **Query** form. You can either use standard SQL for the query, or, if your CS-Direct systems use AltaVista or Verity search engines, you can use an appropriate search engine query.
- Indirectly. You can write the query in an element and then store the location of that element in the query asset by identifying it in the **Element name** field in the **Query** form. An element for a query is like any other element: you can use XML, JSP, JavaScript, HTML, and so on.

Most of the Burlington Financial queries store the query directly; that is, the SQL query is written directly into the **SQL query** field in the **Query** form. For example, the following code is from the News Wire Feed Query:



```
SELECT DISTINCT Article.id, Article.name, Article.updateddate,
Article.subheadline, Article.abstract, Article.description,
Category.description AS category, StatusCode.description AS
statusdesc FROM Article, Category, AssetPublication, StatusCode
WHERE Article.status!='VO' AND Article.category=Category.category
AND Article.status=StatusCode.statuscode AND
Category.assettype='Article' AND Article.source='WireFeed' AND
Article.category='n' AND Article.id = AssetPublication.assetid AND
AssetPublication.pubid = 968251170475 ORDER BY Article.updateddate
DESC
```

## Commonly Used Fields for Queries

There are several CS-Direct fields, four of which are used in the preceding News Wire Feed query example, that you are likely to use in your queries:

- status
- updateddate
- source
- category
- pubid
- startdate
- enddate

The rest of this section defines the fields in this list.

### status

All assets have a **status**. When an asset is created, CS-Direct adds a row to the table that holds assets of that type and sets its status to PL, which means “created.”

The following table lists and defines the status codes that CS-Direct uses:

Status Code	Definition
PL	created
ED	edited
RF	received (from XMLPost, for example)
UP	upgraded from Xcelerate 2.2
VO	deleted (void)

These codes are listed in the `StatusCode` table in the database.

When an asset is deleted, CS-Direct changes its status to VO and renames the string in its Name field to its object ID.

Write your queries to exclude assets whose status is VO. For example: `WHERE Article.status!='VO'`

## updateddate

The information in the **updateddate** field represents the date on which the information in the status field was changed to its current state. Depending on the design of your site, you might want a query to return assets based on this date.

## source

The **source** field is a default CS-Direct field that can identify where an asset originated. It is not required.

For example, the Burlington Financial sample site has sources named WireFeed, Asia Pulse, UPI, and so on. (You add sources for your sites on the **Admin** tab in the tree. See “Step 10: (Optional) Configure Sources” on page 284.)

If you use source with your assets, you can write your queries to use source as a parameter. In the previously mentioned News Wire Feed query example, the `AND Article.source='WireFeed'` statement ensures that only articles with WireFeed in their Source fields are selected by this query.

## category

The **category** is a default CS-Direct field that can categorize assets according to a convention that works for your sites. It is not required.

For example, the Burlington Financial sample site has categories named Personal Finance, Banking and Loans, Rates and Bonds, News, and so on. (You add categories for your sites on the Admin tab in the tree. See “Step 9: (Optional) Configure Categories” on page 283.)

If you use category with your assets, you can write your queries to use category as a parameter. In the previously mentioned News Wire Feed query example, the `Article.category='n'` statement includes article assets from the News category.

## pubid

A **pubid** is a unique value that identifies a site (or, in old terminology, a publication). When an asset is created, CS-Direct writes information about that asset to several database tables, one of which is the `AssetPublication` table.

An asset's row in the `AssetPublication` table includes the pubid of the site the asset was created for. If the asset is shared, the `AssetPublication` table has a row for each site that the asset is shared with. For example, if an article asset is available in two sites, there are two rows for that article in the `AssetPublication` table.

If you have only one CS-Direct site on your system or if your query results do not need to be site-specific, you do not need to code your queries to consider pubid. The Burlington Financial queries, however, are coded to restrict assets based on the pubid of Burlington Financial (`AssetPublication.pubid = 968251170475`) so that they do not return assets from another site.

## startdate and enddate

Neither of the sample sites use the **startdate** and **enddate** fields but the CS-Direct database has columns to store this information. These fields exist so that you can assign time limits to assets.

If your asset types use the startdate and enddate fields, you can create queries that select assets based on the dates stored in those fields.

## Before You Begin

Before you begin creating query assets, consider the following:

- Query assets that are used on assets other than collections are not required to have templates. You can either create template elements specifically for your query assets that identify, run, and display the results, or you can code the template elements for your page assets to do that.
- When you write a query for a collection, be sure to code it to select the fields that are required for that asset type. CS-Direct is programmed to expect information from an asset type's required fields so that it can display that information in the **Build Collection** form.

For example, the **Name** and **Description** fields are required fields for a Burlington Financial article. (The **Description** field is renamed and displayed as **Headline** in the form.) Therefore, the queries for Burlington Financial collections that hold Burlington Financial articles select the **Name** and **Description** fields. Those queries also select several other fields, but CS-Direct requires at least the **Name** and **Description** fields to present the assets returned by the queries in the **Build Collection** forms correctly.

- Query assets that are used only for collections have no need for templates. The template element assigned to the collection formats the assets in a collection's list of assets.
- For performance reasons, be sure to create efficient queries. For example:
  - Include as much logic as possible in the query rather than in the element that runs and displays the results of the query. For example, if you want to filter or constrain a list of articles, be sure the query performs the filtering or constraining step so that the list returned to the element is complete rather than coding the query to return the entire list and using the element code to constrain the list.
  - Be sure your queries return only the information that the element displays.
- Query assets that are for collections must return assets of one type only.

## Creating Query Assets

To create a query asset:

1. If necessary, log in to the Content Server interface.
2. Click **New** on the button bar.
3. Select **Query** from the list of asset types. (Query asset types must be enabled for your site.)

The **Query** form appears:

**Query:**

Cancel Save

\*Name:

Description:

Template:

Category:

\*Result of query:

**SQL query:**

☒ Database:

☐ Element:

Cancel Save

4. (Required) In the **Name** field, type a unique, descriptive name for the query asset. You can enter up to 64 alphanumeric characters, but the first character must be a letter. Underscores (\_) and hyphens (-) are acceptable, but tab and space characters are not.
5. In the **Description** field, type a brief description of the query. You can enter up to 128 characters.
6. In the **Template** field, select a template asset from the drop-down list.
7. In the **Category** field, select a category from the drop-down list. (If you do not select a category, the first item on the list is selected by default.)
8. In the **Result of query** field, select the type of asset that this query returns. (The query can return assets of one type only if this asset is to be used by a collection.)
9. Do one of the following:
  - If you want to store the query directly in this asset, select **Database**, click in the **SQL query** field, and then write your query.
  - If you wrote the query in an element, select **Element** and then enter then entire name of the element in the **Element name** field.
10. Click **Save**.

## Sharing Query Assets

If you plan to share a query asset with another site, consider the following tips:

- If you want your query results to be site-specific, be sure to include a `WHERE` clause for `pubid` so that the query does not return assets to a site where those assets have not been shared.
  - For example, in either a query for a collection or a query for a static site, you can use the following statement:  
`WHERE AssetPublication.pubid = SessionVariables.pubid`  
 because `SessionVariables.pubid` is always set when you are building a collection or using the Export to Disk function.
  - If the query is to be used on a dynamic site, you can use that same statement as long as you code your elements to either pass in the identify of `pubid` to the `ExecuteQuery` element or to set the `SessionVariables.pubid` variable.
- Because page assets cannot be shared, you should not share query assets if they return page assets.
- As with any shared asset, if the query has a template, be sure that the template assigned to the query is also shared with the other site.

For the basic procedure for sharing assets, see the *CSEE User's Guide*.

## Previewing and Approving Query Assets

First, remember that not all query assets have their own templates. If a query asset was designed to be used on a page asset and it is the page asset's template that actually formats the query, you must preview the page in order to preview the query.

If your online site is a dynamic site — that is, you use the Mirror to Server publishing method—a query asset might return different assets on the management system than it does on the delivery system, depending on which assets have been published.

Therefore, if you preview your query to determine whether you should approve it or not, remember that the assets that it returns on the management system (where you are previewing it) could be different than the assets that it will return on the delivery system after it is published.

## Stylesheet Assets

Stylesheet assets store style sheet files of any format (CSS, XSL, and so on). This asset type is installed only if you install the Burlington Financial sample site. Typically, you do not assign template assets to stylesheet assets because they are, effectively, templates in themselves. However, if you need to create a different kind of stylesheet or you want to display information about the stylesheet on a site, you can certainly create a template asset and assign it to a stylesheet asset.

## Creating Stylesheet Assets

To create a stylesheet asset:

1. If the Content Server interface is not already open, log in.
2. Click **New** on the button bar.
3. Select **Stylesheet** from the list of asset types.

The new **Stylesheet** form appears:

StyleSheet:

---

---

\*Name:

Description:

Display Style: No templates available

---

Category:

---

Source:

---

\*StyleSheet:

Mimetype:  ?

---

Alt Text:

Keywords:

---

4. (Required) In the **Name** field, type a unique, descriptive name for the stylesheet. You can enter up to 64 alphanumeric characters, but the first character must be a letter. Underscores (\_) and hyphens (-) are acceptable, but tab and space characters are not.
5. In the **Description** field, type a brief description of the stylesheet. You can enter up to 128 characters.
6. (Optional) In the **Template** field, select one from the drop-down list.
7. In the **Category** field, select a category from the drop-down list. (If you do not select a category, the first item on the list is selected by default.)
8. In the **Source** field, select one from the drop-down list.
9. Do one of the following:
  - In the **StyleSheet** field, enter the full path and file name of the stylesheet.
  - Click **Browse** next to the **StyleSheet** field and select the stylesheet file.
10. In the **Mimetype** field, select the mimetype of the file you specified in the previous step from the drop-down list. If the correct mimetype is not displayed in the list, see “Step 11: (Optional) Add Mimetypes” on page 285.

11. In the **Keywords** field, enter keywords that you and others can use as search criteria in the **Advanced Search** form when you search for this template in the future. For information about searching for assets, see the *CSEE User's Guide*.
12. Click **Save**.

CS-Direct uploads the file you specified in the **Stylesheet** field.

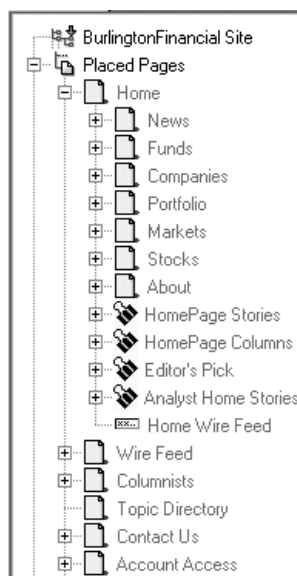
## Sharing Stylesheet Assets

Stylesheet assets are standalone which means that you can share them without considering dependencies with other assets.

## Page Assets

Page assets are site design assets that store references to other assets, organizing them according to the design that you and the other designers are implementing.

Open CS-Direct and examine the page assets listed in the site tree for the Burlington Financial sample site:



These page assets represent sections of the site, in essence the structure or organization of the site. They do not represent each and every rendered page that can possibly be served.

Typically, you create page assets once: when you design the site. You associate collections, queries, articles, and so on with page assets and you code template elements that format the types of assets you want to associate with the page asset.

Before you can select the correct content for your page assets, you must be familiar with how your site is structured and what your template elements for page assets are designed to do. That is why you and other site developers—the people who are coding elements and creating template assets—typically create the page assets for a site.

## Creating a Page Asset

1. If necessary, log in to CS-Direct, and if given a choice, select a site.
2. Click **Search** on the button bar and run as many searches as necessary to find all the articles, queries, images, collections, or other assets that you want to include on the page.
3. In the search results list, select the check box on the right, next to the name of each asset that you want to display on the new page, and click the **Add to My Active List** button at the bottom of the list, as shown here:

				<a href="#">Barak-A291-2001Mar9</a>	Barak in Egypt for Talks with Mubarak	<a href="#">Received</a>	Mar 18, 01 20:01	<input checked="" type="checkbox"/>
				<a href="#">Barak-A451-2001Mar9</a>	Barak to Seek New Shas-Meretz Partnership	<a href="#">Received</a>	Mar 18, 01 20:04	<input checked="" type="checkbox"/>
				<a href="#">Barak-A569-2001Mar9</a>	Barak Reshuffles Cabinet	<a href="#">Received</a>	Mar 18, 01 20:13	<input checked="" type="checkbox"/>
				<a href="#">Bear market funds</a>	Find Out What Funds Work Best When the Market Declines	<a href="#">Created</a>	Jun 20, 01 13:25	<input checked="" type="checkbox"/>
				<a href="#">BF Guide to Benefits</a>	Guide to Benefits	<a href="#">Edited</a>	Mar 17, 01 16:30	<input type="checkbox"/>
				<a href="#">Biggest-A152-2001Mar9</a>	'Biggest and Best' Harlem Week Begins	<a href="#">Received</a>	Mar 9, 01 13:54	<input checked="" type="checkbox"/>
				<a href="#">Bill-A662-2001Mar9</a>	Bill Gets West Wing Zing from Ex-Aides	<a href="#">Received</a>	Mar 18, 01 20:15	<input checked="" type="checkbox"/>

[Add to My Active List](#)

4. CS-Direct displays an updated My Active List page on the right, and also lists the assets on the **My Active List** tab in the tree view on the left:
5. Click **New** on the button bar.
6. Select **Page** from the list of asset types. (Page asset types must be enabled for your site.) The **Page** form appears.
7. (Required) In the **Name** field, type a unique, descriptive name for the page. You can enter up to 64 alphanumeric characters, but the first character must be a letter. Underscores (\_) and hyphens (-) are acceptable, but tab and space characters are not. The name must be unique for page assets you are creating for this site.
8. In the **Description** field, type a brief description of the page. You can enter up to 128 characters.
9. In the **Template** field, select a template asset from the drop-down list.
10. In the **Category** field, select a category from the drop-down list. (If you do not select a category, the first item on the list is selected by default.)
11. If you are creating page assets for exporting to a static site and you are using the **Filename** and **Path** fields, enter the appropriate file name information according to the conventions that your organization is using. For information about how the Export to Disk publishing process uses this information, see the *CSEE Administrator's Guide*.
12. To add items from your active list to the **Current Contents** list on the page form, select and highlight items on the **Active List** tab in the tree view, and click **Add Selected Items**, as shown here:



The screenshot shows a web application interface for editing a page asset. The top navigation bar includes tabs for Product Admin, Design, Active List, Marketing Content, and History Site Plan. The main title is 'Page: Contact Us'. Below the title are buttons for Preview, Inspect, Edit, Delete, and a 'more...' dropdown. There are 'Cancel' and 'Save Changes' buttons. The form fields are as follows:

- \*Name:** Contact Us
- Description:** Contact Burlington Financial
- Template:** Shell
- Status:** Edited
- ID:** 968685130260
- Category:** List Page
- Filename:**
- Path:** /contact/

The 'Contains' section is on the left, and the 'Current Contents' section is on the right. The 'Current Contents' section has a list of assets, with 'Contact Us (Article)' selected. There are 'Add Selected Items' and 'Remove' buttons. There are also up and down arrows on the right side of the 'Current Contents' list.

Whether you select assets from the **Current Contents** section, the **Related** section, or some combination of both to appear on the page asset depends on how you have coded the template element for the page.

Selecting assets from the **Contains** section creates unnamed relationships between the asset and this page asset. The fields in the **Related** section represent named associations. In both cases, the asset becomes a child asset of this page asset, and you can then use an `ASSET.CHILDREN` tag to return those assets.

For information about the `ASSET.CHILDREN` tag, see the *CSEE Developer's Tag Reference*. For information about named associations and unnamed relationships, see "Relationships Between Basic Assets" on page 169.

Adding items to the **Contains** section does not guarantee that those assets will actually appear on the rendered version of the page asset. The template element that you select from the **Template** field must be coded to identify and display the types of assets that are in the **Contains** section, otherwise those assets cannot be rendered.

This also applies to the assets that you select in the **Related** section of the form. Selecting assets from fields that designate named associations between the page asset and assets of other types does not guarantee that those assets will appear on the rendered version of the page asset. The template element must be coded to display them, otherwise, those assets cannot be rendered.

13. Use the arrows on the right side of the **Contains** list to position the assets in the correct order. This determines the order of the assets on a rendered page.
14. In the **Related** section of the form, select the assets that you want to use as the named associations for the page.

The assets that you select in this section become child assets of this page asset.

**Note**

See the *CSEE User's Guide* for instructions about collection assets.

**15. Click Save.**

The page is saved. It now appears on the site tree under the **Unplaced Pages** page. To place the page, see “Placing Page Assets” below.

## Placing Page Assets

After you create a page asset, you position it in the appropriate location in the site tree by using the **Place** function, as follows:

1. If necessary, log in to the Content Server interface.
2. In the site tree on the **Site Plan** tab, you should see the new page asset in the **Unplaced Pages** list, as shown here:



3. Expand the list of **Placed Pages** in the site tree.
4. Right-click on the placed page under which you want to insert the new unplaced page, and choose **Place Page** from the pop-up menu. If you want to place a page at the top-most level in the tree, right-click on the **Placed Pages** icon.

The **Place Page** form appears in the work area on the right. It lists all the existing pages that have not yet been placed in the site tree (as well as any child pages that are placed under the parent page):

• To place a page under Wire Feed, type a rank in the rank column of the "Pages not yet placed" table.

**Pages that have been placed under Wire Feed:**

No pages have been placed for this page.

**Pages not yet placed:**

Rank	Name	Description	Modified
<input type="text"/>	BeeStories	Stories that begin with B	Dec 19 10:44

5. In the list of unplaced pages, type a number in the **Rank** field to designate its position in the list of child page assets (in this example, it would only make sense to type “1”).
6. Click **Save**. The unplaced page asset moves to the site tree. (You may need to right-click in the site tree and choose **Refresh All** from the pop-up menu.)

7. Preview both the parent page and the placed child page. (See “Collection Assets” on page 454 for instructions.)

## Moving Page Assets in the Site Tree

In addition to placing unplaced pages, you can also use the **Place Page** form to:

- Change the order of child pages within the same parent page.
- Move a child page from one parent page to another.

## Re-ordering Child Pages

To re-order children of the same parent page:

1. If necessary, log in to the Content Server interface.
2. Expand the list of **Placed Pages** in the site tree.
3. Right-click on a placed page that has more than one child page, and choose **Place Page** from the pop-up menu.

The place page form appears in the work area on the right.

4. In the list of placed child pages, type new values in the **Rank** column to re-order the child pages.
5. Click **Save**. The child pages move to their new positions in the site tree.

## Changing Parent Pages

To move a child page from one parent page to another:

1. If necessary, log in to the Content Server interface.
2. Expand the list of **Placed Pages** in the site tree.
3. Right-click on the placed page whose child page you want to move, and choose **Place Page** from the pop-up menu.

The place page form appears in the work area on the right.

4. In the list of placed child pages, select the **Remove** check box next to the child page that you want to move, as shown here:

Pages that have been placed under Account Access:

Rank	Remove?	Name	Description	Modified
1	<input type="checkbox"/>	<a href="#">Member Login</a>	Member Login	Feb 11 15:50
2	<input type="checkbox"/>	<a href="#">Account Sign Up</a>	Sign Up and Personalize	Mar 7 11:55
3	<input type="checkbox"/>	<a href="#">Your Profile</a>	Your Personal Profile	Feb 11 15:51
4	<input checked="" type="checkbox"/>	<a href="#">Guide to Benefits</a>	Guide to Benefits	Mar 17 16:03

5. Click **Save**. The child page moves to the list of **Unplaced Pages** in the site tree.
6. In the site tree, right-click on the placed page where you want to insert the unplaced child page, and choose **Place Page** from the pop-up menu.

The place page form appears in the work area on the right.

7. In list of unplaced pages, type a number in the **Rank** field to designate its position in the list of child page assets.

8. Click **Save**. The previously unplaced page asset moves to the site tree.

## Placing Page Assets and Workflow

CS-Direct has a workflow feature that controls the flow of assets as they pass from one team member to another; for example, from author to editor to approver to publisher. The workflow administrator can create processes that control who can place page assets in the site tree and during which workflow step they can do so. Note the following:

- The **Place Page** workflow privilege controls all place page functions: **Place Pages**, **Remove**, and **Rank**.
- You must have the proper privileges for both the parent page on which you invoke **Place Pages**, and for any child page that you want to **Rank** or **Remove**.

For information about the workflow process, see the *CSEE Administrator's Guide*.

## Editing Page Assets

In general, there are two ways to edit an existing page asset:

- Change the assets, but not the asset types, that are included on the page. For example, move new assets to the **Contains** list from your active list; select a different collection, query, or article from a named association field; or rebuild a collection already associated with the page asset to include different assets.
- Create a new association or change the actual structure of the page asset in some way.

Although you may frequently change the content in the collections or queries on a page at regular intervals, you are less likely to change the associations, asset types, or structure of a page after the site goes live. This may also require you to edit the code in the template element that formats the page.

## Deleting Page Assets

During your site design phase, it is likely that you will create and delete many page assets. However, before deleting a page asset from a site that you have published, be sure that you understand the consequences. For example:

- Have you removed references to the page from other page assets?
- Are any of your other page templates coded to extract and use information about this page asset in any way?

Before you delete a page asset, be sure to remove any references to it from any other elements or pages. It is a good idea to unplace a page asset before you delete it.

## Chapter 21

# Coding Elements for Templates and CSElements

Elements provide the code that identifies, extracts, and displays your content. In a CSEE system, your content is stored as assets. Therefore, much of the XML or JSP code in your elements is dedicated to identifying the appropriate asset for the appropriate context and then extracting and displaying that asset's data.

This chapter describes how to code the elements that you make for your template and CSElement assets. For information about creating the assets themselves, see Chapter 19, “Creating Template, CSElement, and SiteEntry Assets.”

This chapter contains the following sections:

- About Dependencies
- About Coding to Log Dependencies
- Calling CSElement and SiteEntry Assets
- Coding Elements that Display Basic Assets
- About Coding Elements that Display Flex Assets
- Coding Templates That Display Flex Assets
- Creating URLs for Hyperlinks
- Handling Error Conditions

## About Dependencies

Your Content Server system tracks and relies on two kinds of dependencies to function correctly:

- **Approval dependencies.** These are conditions that determine whether an approved asset can be published.

The approval system calculates the approval dependencies for an asset when it is approved. If there are dependent assets that also need to be approved, the parent asset will not be published.

- **Compositional dependencies**, that is, page composition dependencies. These are dependencies between assets and the pages and pagelets that they are rendered on that determine whether a page needs to be regenerated.

The ContentServer servlet logs compositional dependencies when it renders pages. The CacheManager servlet consults the dependency log to determine when to regenerate the cached pages. The Export to Disk publishing method consults the dependency logs to determine when an exported page file must be regenerated.

One of your responsibilities while coding elements is to ensure that your code logs compositional dependencies accurately, and, if you are designing a static site, that it sets approval dependencies appropriately, as well.

## The Publishing System and Approval Dependencies

The publishers, editors, and content providers who work on your management system **approve** assets to be published to a target destination. The publishing system then publishes the approved assets automatically, as a background process, according to the schedule that your administration team set up for your CSEE system.

An asset can be published only if it meets all specified approval dependencies, that is, all associated assets must have been either approved or previously published. If not, the asset is **held** from being published until the dependencies are met: the dependent (related) assets must themselves be approved for publishing to the same destination.

This approval process frees your content and editorial team from the responsibility of manually checking asset dependencies and then publishing a large number of related assets. It also ensures that there can be no broken links on your online site after assets are published.

If an asset is subsequently changed, the asset is no longer considered to be approved, and it must be approved again before it can be re-published.

## Calculating Approval Dependencies

Approval dependencies are recorded at the time the asset is approved. They are written to the `ApprovedAssetDeps` table in the Content Server database.

The approval status of an asset is determined by its dependency relationships, which include the approval status of all asset items associated with a particular asset item, as well as the dependency relationships of those associated items.

What is the basis for the dependency calculation? That depends on the publishing method:

- For **Export to Disk**, the approval system renders the asset using either the template that is assigned to it or, if there is one specified, the default approval template for assets of this type. The tags in the template code set approval dependencies that

determine the appropriate dependents for the approved asset. The dependent assets must be in an appropriate approval state before the current asset can be published.

- For **Mirror to Server** or **Export Assets to XML**, the approval process examines the data relationships between asset types. Basic assets have associations. Flex assets have family relationships. Both of these relationships create approval dependencies for these publishing methods. For example, if you approve a flex asset, it will be held from a publishing session unless its parent assets are in an appropriate approval state.

## Exists vs. Exact vs. None

Approval dependencies can be **exists**, **exact**, and, for the Export to Disk publishing method, **none**. This section defines each kind of approval type.

You cannot change the approval dependency type for CSElements and SiteEntry assets, embedded links and pagelets, or the CS-Engage visitor data assets. With the exception of flex attributes—whose dependency type you set when you create the attribute—you also cannot change the approval dependency type for the flex family asset types. For basic asset types, you set the type of approval dependency for their associated assets when you configure the association fields.

When your publishing method is Export to Disk, the tags that set compositional dependencies when pages are rendered also create approval dependencies when the approval system calculates whether an asset can be published. When your code sets approval dependencies on pagelets generated for other assets, you can set the approval type to exists, exact, or none.

### Note

For information about the types of approval dependencies created by the the relationships between assets of the various types, see the publishing chapter in the *CSEE Administrator's Guide*.

### Exists

With an **exists** dependency, the dependent asset must merely exist on the target—the version of the asset does not matter. An **exists** dependency means that an approved parent asset can be published even if a child asset changes (which means that the child asset is no longer approved), as long as the child asset was previously approved and published to that same destination.

For example, in the following sequence, a collection asset has an **exists** relationship with its ranked children:

1. A collection and all of its ranked articles are approved and published to a target.
2. One of the ranked articles is edited again, but not approved.
3. The collection itself is edited again, approved, and published to the destination.

The collection is not held back from publishing by the changed but unapproved article, because a prior version of the article already “exists.”

However, in the following example, a collection with an **exists** dependency relationship to its articles cannot be published:

1. A collection and all of its ranked articles are approved but not published.

2. One of the ranked articles is edited again.

Because the edited article was never published to the destination, it does not yet exist for that destination, which means that the collection cannot be published. The collection asset is **held** and both the collection and the edited article must be approved before the collection can be published.

The exists approval type is generally useful for links.

### Exact

With an **exact** dependency, the dependent asset must be the exact version on the target. No other previously approved version will do. An **exact** dependency means that the parent asset cannot be published if the version stamp of the parent and child assets on the destination do not match.

In the following example, a page asset has an **exact** dependency with its article assets:

1. A page asset and all of its article assets are approved and published to a destination.
2. One of the articles is edited again, but is not re-approved.
3. The page asset is edited and is re-approved.

The page asset is held, and the resulting form in the Content Server interface displays a link that points to a list of the assets that must be approved before the page asset can be published. This list shows the article that was edited but not re-approved.

4. The edited article is approved.

The page asset has already been approved and can now be published because the version stamps of the article and the page asset match.

5. Another article asset associated with the page asset is edited.
6. Both the page asset and the edited article asset must be re-approved because the version stamps of the two do not match:
  - The article must be re-approved because it was edited but not yet re-approved.
  - The page asset must be re-approved because it was previously approved with a dependency on a different version of the article.

The exact approval type is generally useful for embedded content.

### None

A **none** dependency means that the approved asset can be published no matter what approval state the dependent asset is in. You can set the approval dependency type to none by adding the `DEPTYPE` parameter to a tag that sets an approval dependency and setting that parameter to none.

Note that setting `DEPTYPE` to none effects the approval dependency only. When the Export to Disk process generates the page and invokes the tag, a compositional dependency is logged. But when the approval system invokes the tag during its calculation, no approval dependency is logged.

## Approval Templates for Export to Disk

When assets are approved for a publishing destination that uses the Export to Disk publishing method, the approval system examines the template assigned to the asset to determine its dependencies.



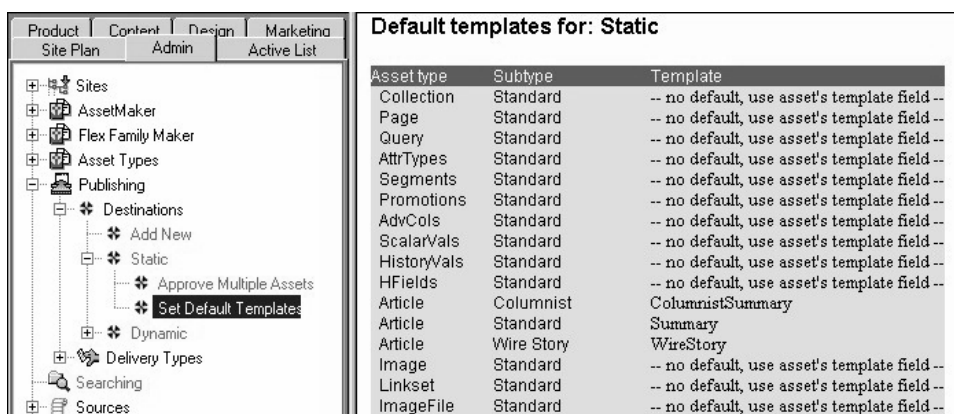
However, when Export to Disk actually publishes the asset, it does not necessarily use the template that is assigned to the asset. Why? Because the code in another element could determine that a different template is used for that asset in certain cases.

Consider the Burlington Financial sample site. An article asset from this sample site can be rendered by several different templates, depending on the context.

So when you approve an article asset for the Burlington Financial sample site, which template should the approval process use to determine the dependencies for the article? The one that contains the most representative set of dependencies for all of the templates. For an example, see the Burlington Financial template article named Full. You may decide to create a special template that contains all the possible dependencies for assets of each type.

What if the template that contains the most representative set of dependencies is not the template that you want to assign to the asset? Set it as the **Default Approval Template** for assets of that type.

You can set Default Approval Templates for each asset type and for each publishing destination. This feature is located in the tree on the **Admin** tab:



Asset type	Subtype	Template
Collection	Standard	-- no default, use asset's template field --
Page	Standard	-- no default, use asset's template field --
Query	Standard	-- no default, use asset's template field --
AttrTypes	Standard	-- no default, use asset's template field --
Segments	Standard	-- no default, use asset's template field --
Promotions	Standard	-- no default, use asset's template field --
AdvCols	Standard	-- no default, use asset's template field --
ScalarVals	Standard	-- no default, use asset's template field --
HistoryVals	Standard	-- no default, use asset's template field --
HFields	Standard	-- no default, use asset's template field --
Article	Columnist	ColumnistSummary
Article	Standard	Summary
Article	Wire Story	WireStory
Image	Standard	-- no default, use asset's template field --
Linkset	Standard	-- no default, use asset's template field --
ImageFile	Standard	-- no default, use asset's template field --

### Note

If you specify a default approval template for an asset type on a destination that uses the Mirror to Server publishing method, that template is used when you preview the asset on the Asset Status screen, but not when the asset is approved or published.

## Subtypes, Flex Definitions, and Approval Templates

If you are using flex assets for a static site, you can assign more than one default approval template to the flex asset type in the family. You can designate a different default approval template for each flex definition.

For basic assets, the Subtype feature provides a way to further categorize assets of a single asset type. You can use this feature to assign more than one default approval template for assets of a specific type, based on some other organizing construct.

For example, perhaps the approval template for sports articles should be different than the approval template for world news articles. You can create a sports subtype and a world

news subtype for the article asset type and then assign different approval templates for each subtype of the asset type.

You create subtypes for basic assets either in the asset descriptor file when you create the asset type or by using the **Asset Types** option on the **Admin** tab if you decide you need subtypes after the asset types were created. You assign a subtype to an asset by using the New and Edit asset forms. As mentioned, flex assets already have subtypes: their flex definitions.

For more information about configuring subtypes for basic assets, and about subtypes in general, see Chapter 13, “Designing Basic Asset Types.”

## Page Generation and Compositional Dependencies

Compositional dependencies are recorded in different ways:

- When the Export to Disk publishing method renders a page, it logs compositional dependencies to the appropriate publishing tables. Then, when it's time to publish again, Export to Disk can determine which pages need to be regenerated based on which assets are being published—it generates all the pages that have logged the assets as compositional dependents.
- When Content Server renders and caches a page, it logs the dependencies in the `SystemItemCache` table at the time a page is rendered and cached. Each row in this table holds the ID of an asset and the cachekey or ID of the generated page that the asset was rendered on.

## CacheManager and the Page Caches

The CacheManager maintains the Content Server page caches. As assets are changed, it consults the `SystemItemCache` table to determine which cached pages those assets were rendered on. Then it works through the `SystemPageCache` table, flushing and regenerating the appropriate pages.

After it makes changes to the Content Server page cache, CacheManager communicates that information to all the CS-Satellites participating in your Content Server system, the co-resident CS-Satellite and any remote CS-Satellites that are installed in your system. The CS-Satellite applications then update the Satellite page caches.

### Note

If you have the appropriate permissions, you can examine the data in the `SystemItemCache` and `SystemPageCache` tables, but, as with any other system table in the Content Server database, do not alter the information stored in these tables in any way.

## CacheManager and Mirror to Server Publish Sessions

The CacheManager interacts with the publishing system during Mirror to Server publishing session. When a Mirror to Server publishing session ends, the publishing system provides a list of all the IDs of all the assets that were included in the publish operation to the CacheManager servlet on the destination system.

The CacheManager compares that list to the compositional dependencies logged for the pages in the cache to determine which pages and pagelets need to be flushed from the page

cache and regenerated. It updates the Content Server page cache accordingly, and then sends the list of pages to the co-resident and remote Satellite servlets so they can flush those same pages and get new versions from the Content Server page cache.

## CacheManager and the Preview Function

When you preview an asset (on the development or management system), the Content Server interface executes the page name of the template for the asset. ContentServer renders the page, caches the page, and logs the compositional dependencies between the rendered page and the asset.

CacheManager updates the cached versions of previewed pages when assets are saved. That is, when someone clicks **Save**, CacheManager compares the object ID of that asset to the compositional dependencies logged for the pages in the cache. It then clears and refreshes the appropriate pages in the page cache and communicates the information about the changed pages to the Satellite servlets.

## About Coding to Log Dependencies

While you are coding elements, one of your responsibilities is to include code that logs dependencies accurately.

There are several tags that log compositional dependencies. When the tag is executed, Content Server logs a dependency between the rendered page and the asset by writing this information in the `SystemItemCache` table.

Note that for a static site using the Export to Disk publishing method, the tags that log compositional dependencies can also log approval dependencies. When an asset is approved, the approval system renders that asset to determine whether it can be published. It logs the results of these tags to the `ApprovedAssetDep` table unless the tag sets the approval dependency type to none. (See “Exists vs. Exact vs. None” on page 471 for more information about the “none” dependency type.)

This section presents the tags that log dependencies alphabetically. For more information about these and any other tag, see the *CSEE Developer's Tag Reference*.

### ASSET.LOAD and asset:load

When Content Server executes an `ASSET.LOAD` tag (or `asset:load`), it automatically logs a compositional dependency for the asset that is loaded. For example:

```
<ASSET.LOAD TYPE="Page" NAME="target" FIELD="name" VALUE="Home" />
```

That line of code marks a compositional dependency between the page asset named “Home” and the rendered page that is displaying this asset.

### Setting the Approval Dependency Type

When an asset is approved for an Export to Disk destination and the approval system renders this tag, the tag also logs an approval dependency between the assets that are in play.

By default, the approval dependency for `ASSET.LOAD` is set to `exact`. You can set the dependency to `exists` or to `none` by using the `DEPTYPE` parameter. For example:

```
<ASSET.LOAD TYPE="Page" NAME="target" FIELD="name" VALUE="Home"
DEPTYPE="exists"/>
```

## The ASSETSET (assetset) Tag Family

You use the ASSETSET tag family to create a set of one or more flex assets. The following tags create assetsets and define compositional dependencies for the assets in the set:

```
ASSETSET.SETASSET and assetset:setasset
ASSETSET.SETEMPTY and assetset:setempty
ASSETSET.SETLISTEDASSETS and assetset:setlistedassets
ASSETSET.SETSEARCHEDASSETS and assetset:setsearchedassets
```

When an asset from the assetset is rendered, the compositional dependency is logged.

The first three tags define the following compositional dependencies:

- A dependency between each flex asset in the assetset and the rendered page.
- A dependency between the flex asset's parents and the rendered page. Because flex assets inherit values from their flex parent assets, a change to a parent can mean a change to the flex asset and that means the pages that hold the asset may no longer be accurate.

The fourth tag, `assetset:setsearchedassets`, creates an assetset from the results of a search state. Search states are queries, which means there is no way to predict the identities of the assets in the set. Therefore, the `ASSETSET.SETSEARCHEDASSETS` tag defines the compositional dependency as “unknown.” When a compositional dependency is unknown, it means the page must be regenerated during each Export to Disk publishing session and updated in the page caches after each Mirror to Server publishing session, whether it needs it or not.

If you have a search state that describes a fixed set of assets whose identities will not change, you instruct Content Server to set compositional dependencies for the assets in the assetset by setting the optional `fixedlist` property to “true.”

For example:

```
<assetset:setsearchedassets name="as" assettypes="Products"
constrain="ss" fixedlist="true" />
```

This example defines that there is a compositional dependency between each product asset in the assetset named “as” and the rendered page.

For more information about asset sets and search states, see “Assetsets” on page 489 and “Searchstates” on page 490.

## Setting the Approval Dependency Type

If you are using flex assets for a static site, be aware that when the approval system invokes an assetset tag, the approval dependency type is set to `none` by default. To change this value to `exists` or `exact`, you use the `deptype` parameter.

For example:

```
<assetset:setsearchedassets name="as" assettypes="Products"
constrain="ss" fixedlist="true" deptype="exists" />
```

Note that setting an approval type for the `assetset:setsearchedassets` tag is meaningful only if the `fixedlist` parameter is set to `true`.

## RENDER.GETPAGEURL and render:getpageurl

The `RENDER.GETPAGEURL` tag creates a URL for assets that are not blobs. This tag logs an **exists approval** dependency—but **not** a compositional dependency—between the asset being approved (rendered) and the asset referred to by the tag. This means that it creates a dependency only when your publishing method is Export to Disk.

In this example, the template assigned to article ABC has the following code in it:

```
<RENDER.GETPAGEURL PAGENAME="BurlingtonFinancial/Page/Home"
    cid="Variables.pageid"
    c="Page"
    OUTSTR="referURL" />
```

That code fragment both creates a URL (that is returned in the variable created by the `OUTSTR` parameter) and logs an **exists** approval dependency between the asset identified in the `cid` variable and article ABC.

Then, when article ABC is approved, the page identified by the `cid` variable must either be approved or must already have been published or article ABC is held from being published.

## RENDER.LOGDEP (render:logdep)

There are several situations in which your code can obtain an asset's data without actually loading the asset. When this is the case, be sure to log the compositional dependency yourself with the `render:logdep` tag.

### Example 1

When you call a CSElement from a template asset or other CSElement asset, you do not load the asset to determine the identity of the element file to execute. Instead, you use the `RENDER.CALLELEMENT` or `render:callelement` tag and invoke the element directly by name. For example:

```
<render:callelement name="BurlingtonFinancial/Common/
HeaderText" />
```

Because you didn't use the `asset:load` tag to access the CSElement, the compositional dependency between the CSElement asset and the page it is being rendered on is not automatically logged for you. Instead, you must set it yourself.

At the beginning of the element for each CSElement asset, you include the following line of code:

```
<render:logdep cid="Variables.eid" c="CSElement" />
```

At the beginning of the element for a template asset, the `render.logdep` statement would be as follows:

```
<render:logdep cid="Variables.tid" c="template" />
```

Note that if you use the CSElement form or the template form in the Content Server interface to start coding the element, Content Server automatically includes an appropriate `render:logdep` statement in the stub code that it seeds into the element for you.

### Example 2

For basic assets, when you use an `ASSET.LOAD` tag on a parent asset (basic asset) and then use an `ASSET.CHILDREN` tag, you have access to the children assets' data without having

to load it. In this case, you should include a `RENDER.LOGDEP` statement to log the compositional dependency.

For example:

```
<ASSET.CHILDREN NAME="PlainListCollection" LIST="theArticles"
  OBJECTTYPE="Article" ORDER="nrank" CODE="--"/>
<LOOP LIST="theArticles">
  <RENDER.LOGDEP cid="theArticles.id" c="Article"/>
  .
  .
  .
```

## Setting the Approval Dependency Type

When an asset is approved for an Export to Disk destination and the approval system invokes this tag, the tag also creates an exact approval dependency between the asset and the rendered page.

You can change the approval dependency type to exists or none by setting the `DEPTYPE` argument. For example:

```
<RENDER.LOGDEP cid="theArticles.id" c="Article"
  DEPTYPE="exists"/>
```

## RENDER.FILTER and render:filter

You use the `RENDER.FILTER` tag for lists of assets created by queries. This tag filters out any unapproved assets from a list or a query. It also sets a compositional dependency of “unknown.” (The “unknown” compositional dependency is explained in the next section, “`RENDER.UNKNOWNDEPS` and `render:unknowndeps`.”)

You use this tag when you do not want an approved asset that has an approval dependency on the results of a query (a collection or query asset, for example) to be held from being published when there are unapproved assets in the list that is returned by the query. For example, say that the element is coded to provide appropriate formatting for any number of article assets that are passed to it so it doesn’t matter if only two of the five articles included in a collection cannot be published. Because this tag tells Export to Disk to filter out the unapproved assets, a page using the query can be published while the unapproved assets remain unpublished.

You might use this tag in the following places:

- Templates for query assets
- Templates for collection assets
- `SELECTTO` statements and `EXECSQL` queries

For example:

```
<RENDER.FILTER LIST="ArticlesFromWireQuery"
  LISTVARNAME="ArticlesFromWireQuery" LISTIDCOL="id"/>
```

## RENDER.UNKNOWNDEPS and render:unknowndeps

The `RENDER.UNKNOWNDEPS` tag signals that there are dependent assets but that there is no way to predict the identities of those assets because they came from a query or change frequently. This tag logs a compositional dependency of “unknown” for the rendered page. This tag does not set an approval dependency for the Export to Disk publishing method.

When a compositional dependency is set to “unknown,” it means the page must be regenerated during each Export to Disk publishing session and updated in the page caches after each Mirror to Server publishing session, whether it needs it or not. This means that you must use this tag carefully because the more pages there are that must be regenerated, the longer it takes to publish your site.

You use this tag to cover those coding situations in which you truly cannot determine what the dependent assets might be. For example, queries are dynamic and can retrieve a different resultset every time they are run. When you use queries of any kind—query assets, `SELECTTO` statements, `EXECSQL`, and so on—you should use the `RENDER.UNKNOWNDEPS` tag.

## Calling CSElement and SiteEntry Assets

When your design requires that your code call a CSElement or SiteEntry asset, there is no need to load the asset itself. From a coding point of view, you are not interested in the CSElement or SiteEntry as an asset—you are solely interested in the element or page entry that the asset represents. Therefore, your code can directly invoke the element or page entry with the appropriate tag.

If a CSElement does not have a corresponding SiteEntry asset (which means its output is cached according to the cache criteria set for the calling page), you invoke it by name with the `RENDER.CALLELEMENT` (`render:callelement`) tag. For example:

```
<render:callelement name="BurlingtonFinancial/Common/
SetHTMLHeader"/>
```

When CSElement does have a corresponding SiteEntry asset, you invoke the element by calling the page name of its SiteEntry asset with the `RENDER.SATELLITEPAGE` (`render:satellitepage`) tag. For example:

```
<render:satellitepage pagename="BurlingtonFinancial/Pagelet/
Common/SiteBanner"/>
```

### Note

When you use CS-Explorer to examine `SiteCatalog` and `ElementCatalog` entries, they are presented as folders and subfolders that visually organize the pages and pagelets.

However, these entries are simply rows in a database table—there is no actual hierarchy. Therefore your code must always call a page entry or an element entry by its entire name. You cannot use a relative path.

Additionally, note that the chain of called elements should not be more than 20 levels deep: otherwise the assets that are displayed may behave unpredictably.

## Coding Elements that Display Basic Assets

To code an element for a template, you need to understand how the asset type it formats is designed. That is why this developer's guide covers both data design and site design in the same book.

For example, the Home page asset for the Burlington Financial site has four collections and one query assigned to it through named associations:

- TopStory collection
- SideBarTop collection
- SideBarMiddle collection
- SideBarBottom collection
- Wirefeed Query

The Home page asset has a template, also called Home. The Home template is coded to identify the collections and the query related to the Home page through these named associations and to display the assets in the collection and the assets returned by the query.

Because the Home template is coded to handle any collection or query that is associated with the Home page through these named associations (rather than hard-coded to extract specific articles), the assets that are displayed on the page can be updated as often as necessary but the code does not need to change.

Content providers can change the articles in the collections, and the wire feed service can make daily updates to the articles that the Wirefeed Query obtains. And no matter which articles are selected in the collections or returned by the query, they are always formatted in the same way.

This section provides:

- Information that you should keep in mind while you code templates for basic asset types.
- Code fragments and examples for various situations, including managing the dependencies between assets so that approval can be calculated correctly for static sites and so that the page cache can be cleared when appropriate for dynamic sites.

Before you begin, be sure to read the chapters in the Programming Basics section of this book, especially Chapter 3, "Programming with CSEE."

For information about the tags used in the code examples in this chapter, see the *CSEE Developer's Tag Reference*.

For more code samples that display basic assets, see Chapter 22, "Template Element Examples for Basic Assets."

## Assets That Represent Simple Content

Template elements for content assets generally extract one specific article, advertising copy, special offer, image, and so on from the database, then obtain information from the relevant fields such as headline, body, and byline (for example), and then display that content online.

Consider the following simple template element designed for a Burlington Financial article asset:



```

<?xml version="1.0" ?>
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- Article/VeryBasic
-
- INPUT
- Variables.c - asset type (Article)
- Variables.cid - id of the asset to display
- Variables.tid - template used to display the page(let)
- OUTPUT
-
-->
<!-- log the template as a dependent of the pagelet being
rendered, so changes to the template will force regeneration of
the page(let) -->

<IF COND="IsVariable.tid=true">
  <THEN>
    <RENDER.LOGDEP cid="Variables.tid" c="Template"/>
  </THEN>
</IF>
<!-- asset load will mark the asset as an 'exact' dependent of the
pagelet being rendered -->

<ASSET.LOAD NAME="anAsset" TYPE="Variables.c"
OBJECTID="Variables.cid"/>

<!-- get all the primary table fields of the asset -->

<ASSET.SCATTER NAME="anAsset" PREFIX="asset"/>

<!-- display the description -->

<CSVAR NAME="Variables.asset:description"/><br/>

<!-- display the contents of the urlbody file -->

<ics.getvar name="asset:urlbody" encoding="default"
output="bodyvar"/>
<RENDER.STREAM VARIABLE="bodyvar" /><br/>

</FTCS>

```

This code in this template does the following things:

- Logs a compositional dependency between the template asset and the page being rendered with the element with the `RENDER.LOGDEP` tag.
- If the approval system is evaluating this code for an Export to Disk target, logs an approval dependency.
- Loads the article asset with an `ASSET.LOAD` tag, which logs a compositional dependency between the article asset and the page being rendered.
- Extracts all the values from all the fields of the article with an `ASSET.SCATTER` tag.

- Displays the contents of the description column with a CSVAR tag. The description column corresponds to the **Headline** field in the **New** or **Edit** article forms in the Content Server interface.
- Displays the contents of the urlbody column with the `ics.getvar` and `RENDER.STREAM` tags. The urlbody column corresponds to the **Headline** field in the **New** or **Edit** article forms in the Content Server interface.

Notice the difference in the code that displays the value from `description` column and the code that displays the value from the `urlbody` column. The `urlbody` column can contain embedded links and whenever a field can contain embedded links, you ensure that the links are rendered correctly by using the `RENDER.STREAM` tag rather than the `CSVAR` tag.

For a more complex example of an article template, examine the Burlington Financial template named Full. You can examine it in two ways:

- Search for and then inspect it in the Content Server interface.
- Use Content Server Explorer to open the template element called:  
`ElementCatalog/BurlingtonFinancial/Article/Full.`

This template element provides the format for an article when it is displayed, in full, on a page in a browser.

## Associations

You identify the assets that are associated with other assets through association fields with the `ASSET.CHILDREN` tag. To specify which associated asset, you use the `CODE` parameter to specify the association field.

For example, say that the following code fragment is inserted right before the `</FTCS>` tag in the preceding example:

```
<!-- display the Main Image -->
<ASSET.CHILDREN NAME="anAsset" LIST="associatedImage"
  CODE="MainImage" />
<IF COND="IsList.associatedImage=true">
  <THEN>
    <RENDER.SATELLITEPAGE PAGENAME="BurlingtonFinancial/ImageFile/
      TeaserSummary" ARGS_cid="associatedImage.oid" />
    </THEN>
  </IF>
```

The code in this fragment does the following things:

- Extracts the imagefile asset that is specified in the Main Image field for this article asset (named “anAsset”) with the `ASSET.CHILDREN` tag and the `CODE` parameter set to “MainImage.”
- Passes the identity of that imagefile to the page entry for the TeaserSummary template with the `RENDER.SATELLITEPAGE` tag. The page entry is identified with the `PAGENAME` parameter and the imagefile is identified with the `ARGS_cid` parameter. The TeaserSummary template then renders the imagefile into a pagelet and passes the pagelet back to this page, where it is displayed with the article.

## ImageFile Assets or Other Blob Assets

The imagefile asset type stores uploaded image files. In other words, the imagefile asset type is a **binary large object** (blob), served from the Content Server database. You use the BlobServer servlet to serve and display imagefiles and other blobs.

A template element for an imagefile or other blob can use the `RENDER.SATELLITEBLOB` tag to create and return an HTML tag that tells the browser how to access the blob and how to format and display it. If you need a BlobServer URL only, without it being embedded in an HTML tag, you can use the `RENDER.GETBLOBURL` tag.

For more information about coding links to blobs, see “Creating URLs for Hyperlinks” on page 503.

## Basic Assets That Can Have Embedded Links

The **Body** field of the Article asset and other assets that have fields with a data type of `TEXTAREA` allow editors to create embedded hyperlinks within the text field. To ensure that these links are rendered properly, use the `RENDER.STREAM` tag to retrieve the contents of the field, as shown in the following example:

```
<ASSET.LOAD TYPE="Variables.c" OBJECTID="Variables.cid"
  NAME="TestArticle"/>
<ASSET.SCATTER NAME="TestArticle" PREFIX="articleAsset"/>

<!-- display the contents of the urlbody file -->

<ics.getvar name="articleAsset:urlbody" encoding="default"
output="bodyvar"/>
<RENDER.STREAM VARIABLE="bodyvar" /><br/>
```

If InSite Editor is enabled on your management system, note that the `INSITE.EDIT` tag also manages embedded links appropriately when it retrieves the contents of a field that has embedded links in it. For more information about the InSite Editor, see Chapter 29, “Coding for the InSite Editor.”

## Collections

Templates for collection assets typically extract the assets in the collection from the database with an `ASSET.CHILDREN` tag. For example:

```
<ASSET.LOAD TYPE="Variables.c" OBJECTID="Variables.cid"
  NAME="PlainListCollection"/>
<ASSET.SCATTER NAME="PlainListCollection" PREFIX="asset"/>
<ASSET.CHILDREN NAME="PlainListCollection" LIST="theArticles"
  OBJECTTYPE="Article"/>
```

After the children are identified, the template code can then display parts of these assets in a list on a rendered page.

Sometimes the template for a collection is coded to handle the first item in the collection differently than the rest. You can single out the highest ranking asset in a collection by coding the element to order the items in the list according to their rank, as shown here:

```
<ASSET.CHILDREN NAME="HomePageStories" LIST="theArticles"
  OBJECTTYPE="Article" ORDER="nrnk"/>
```

For a longer example, examine the Burlington Financial template named MainStory List. You can examine it in two ways:

- Search for and then inspect it in the Content Server interface.
- Use Content Server Explorer to open the template element called:

ElementCatalog/BurlingtonFinancial/Collection/MainStoryList

This template element calls two page entries for two other templates. The root element for the first of the two page entries displays the highest ranked article from the collection. The root element for the second displays the rest of the articles.

## Collection Templates and Approval Dependencies

When your publishing method is Export to Disk, you can use the `RENDER.FILTER` tag in your collection templates. This tag filters out any unapproved assets from the collection both when the approval dependencies are calculated and when the publish process renders the site.

The following code fragment, taken from the Burlington Financial StoryList template, illustrates this tag:

```
<ASSET.LOAD TYPE="Variables.c" OBJECTID="Variables.cid"
  NAME="StoryListCollection"/>
<ASSET.SCATTER NAME="StoryListCollection" PREFIX="asset"/>
<ASSET.CHILDREN NAME="StoryListCollection" LIST="theArticles"
  ORDER="nrank" CODE="-"/>

<!-- Get only the articles that are approved for export -->

  <RENDER.FILTER LIST="theArticles"
    LISTVARNAME="ApprovedArticles"
    LISTIDCOL="oid"/>

<!-- Display only the articles that are approved-->

  <IF COND="IsList.ApprovedArticles=true">
    <THEN>
      <LOOP LIST="ApprovedArticles">
        <RENDER.SATELLITEPAGE
          PAGENAME="BurlingtonFinancial/Article/Summary"
          ARGS_cid="ApprovedArticles.oid"
          ARGS_p="Variables.p"/>
        </LOOP>
      </THEN>
    </IF>
```

## Collection Templates and Compositional Dependencies

In the preceding code example that illustrates the `RENDER.FILTER` tag, the ID of each of the child assets in the collection is passed to the Summary template.

The first line of code in the Summary template is an `ASSET.LOAD` statement, which means that the dependency between article asset that it loads and the page that is rendered with the Summary template is logged.

What if the code in the template for the collection also formats the child articles? In that case, you must carefully consider the code and determine whether you need to log the dependency with the `RENDER.LOGDEP` tag.

For example, when you use the `OBJECTTYPE` parameter in an `ASSET.CHILDREN` tag, the resulting list is a join of the `AssetRelationTree` table and the asset table for the type specified and includes information from both tables. For example

```
<ASSET.CHILDREN NAME="StoryListCollection" LIST="theArticles"
  OBJECTTYPE="Article" ORDER="nrank" CODE="-" />
```

You can then access the children asset's information without using subsequent `ASSET.LOAD` tags. If you do, be sure to include the `RENDER.LOGDEP` tag for each child so that the compositional dependencies between those assets and the rendered page can be tracked correctly.

For another example, see “Example 2: Coding Links to the Article Assets in a Collection Asset” on page 515.

## Query Assets

Query assets can execute SQL code or they can run an element that contains query code. You use them in collections, on page assets, and so on:

- You build a collection by running a query in the Build Collection form and then selecting and ordering the assets you want from the resulting list. The collection is a static list of assets selected from the query's resultset.
- You select queries for a page asset either through unnamed relationships or through named associations. You select queries for assets like articles through named associations.

In these cases, the page or article assets do not themselves invoke the query: you code the query template element to invoke a standard CS-Direct element called `OpenMarket/Xcelerate/AssetType/Query/ExecuteQuery`. This element runs the query asset when the page asset or article asset is rendered.

Elements for query templates invoke the `ExecuteQuery` element and typically include code that loops through the items returned in the list object that the query created, extracts bits of information from those items, and then displays it.

The following example loads a query asset and passes it to the `ExecuteQuery` element:

```
<ASSET.LOAD TYPE="Query" NAME="Wirefeed"
  OBJECTID="Variables.id" />
<CALLELEMENT NAME="OpenMarket/Xcelerate/AssetType/Query/
  ExecuteQuery">
  <ARGUMENT NAME="list" VALUE="ArticlesFromWireFeed" />
  <ARGUMENT NAME="assetname" VALUE="WireFeed" />
  <ARGUMENT NAME="ResultLimit" VALUE="-1" />
</CALLELEMENT>
```

For a longer example, examine the Burlington Financial query template named `PlainList`. You can examine it in two ways:

- Search for and then inspect it in the Content Server interface.
- Use Content Server Explorer to open the template element called: `ElementCatalog/BurlingtonFinancial/Query/PlainList`.

This element invokes the `ExecuteQuery` element to run the `PlainListQuery` query asset, filters out any unapproved asset if the publishing method is `Export to Disk`, and then loops through the resulting list, obtaining a dynamic URL for each item in the list and creating a hyperlink for it.

For information about hyperlinks, see “Creating URLs for Hyperlinks” on page 503.

## Queries and Compositional Dependencies

The first line of code in the `ExecuteQuery` element is a `RENDER.UNKNOWNDeps` tag, which alerts the `Export to Disk` publishing method and the `CacheManager` on a dynamic delivery system that the assets that will be retrieved by the query cannot be predicted and, therefore, no dependencies can be calculated and logged.

If you are using any other kind of query—for example, a `SELECTTO` statement, `CALLSQL`, or `EXECSQL`—you should include the `RENDER.UNKNOWNDeps` tag.

Additionally, in the element that a query-generated list of assets is returned to, you must use the `RENDER.FILTER` tag if you are using the `Export to Disk` publishing method. For example:

```
<CALLELEMENT NAME="OpenMarket/Xcelerate/AssetType/Query/
ExecuteQuery">
  <ARGUMENT NAME="list" VALUE="ArticlesFromTheQuery"/>
  <ARGUMENT NAME="assetname" VALUE="PlainListQuery"/>
  <ARGUMENT NAME="ResultLimit" VALUE="5"/>
</CALLELEMENT>

<!-- On export - filter out un-approved assets -->
<RENDER.FILTER LIST="ArticlesFromTheQuery"
LISTVARNAME="ArticlesFromTheQuery" LISTIDCOL="id"/>

<if COND="ArticlesFromTheQuery.#numRows!=0">
<then>
  <LOOP LIST="ArticlesFromTheQuery">
    <RENDER.GETPAGEURL PAGENAME="BurlingtonFinancial/
Article/
Variables.ct"
      cid="ArticlesFromTheQuery.id"
      c="Article"
      p="Variables.p"
      OUTSTR="referURL"/>
    <A class="wirelink" HREF="Variables.referURL"
REPLACEALL="Variables.referURL"><csvar
NAME="ArticlesFromTheQuery.subheadline"/></A><P/>
  </LOOP>
</if>
```

For another example, see “Example 4: Coding Templates for Query Assets” on page 521.

## Page Assets

Templates for page assets generally contain the following kinds of code:

- The framework for the page asset when it is a rendered page
- The logic for obtaining the content for the rendered page
- The logic for links to other rendered pages

The templates for content assets contain the formatting code for individual pieces of content. The page templates invoke the templates for the other assets, receive formatted assets from those template elements, and then place the formatted assets into the context of the page framework.

Following is the code for a simple template that formats a page asset:

```
<?xml version="1.0" ?>
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- Page/CollectionsAndQuery
-
- INPUT
- Variables.c - asset type (Page)
- Variables.cid - id of the asset to display
- Variables.tid - template used to display the page(let)
- OUTPUT
-
-->

<!-- log the template as a dependent of the pagelet being
rendered, so changes to the template will force regeneration of
the page(let) -->

<IF COND="IsVariable.tid=true">
  <THEN>
    <RENDER.LOGDEP cid="Variables.tid" c="Template"/>
  </THEN>
</IF>

<!-- asset load will mark the asset as an 'exact' dependent of the
pagelet being rendered -->

<ASSET.LOAD NAME="anAsset" TYPE="Variables.c"
  OBJECTID="Variables.cid"/>

<!-- get all the primary table fields of the asset -->

<ASSET.SCATTER NAME="anAsset" PREFIX="asset"/>

<!-- get a list of id's of the child assets in the collection in
order of their rank -->

<!-- get the WireFeed query -->

<ASSET.CHILDREN NAME="HomeTextPage" LIST="WireFeedStories"
```

```

CODE="WireFeed"/>
<IF COND="IsList.WireFeedStories=true">
  <THEN>
    <RENDER.GETPAGEURL PAGENAME="BurlingtonFinancial/Query/
WireFeedFrontText"
      cid="WireFeedStories.oid"
      c="Query"
      p="Variables.asset:id"
      OUTSTR="referURL"/>
    <P>
    <B><FONT FACE="Verdana, Arial, Helvetica, sans-serif"><A
HREF="Variables.referURL" REPLACEALL="Variables.referURL">From
the Wires...</A>
    </FONT></B>
    </P>
    <RENDER.SATELLITEPAGE PAGENAME="BurlingtonFinancial/Query/
WireSummaryText"
      ARGS_cid="WireFeedStories.oid"
      ARGS_ct="WireStoryText"
      ARGS_p="Variables.asset:id"/>
    </THEN>
  </IF>
</FTCS>

```

The code in this example does the following things:

- Logs a compositional dependency between the template asset and the page being rendered with a `RENDER.LOGDEP` tag.
- Loads the page asset with an `ASSET.LOAD` tag, which logs a compositional dependency between the article asset and the page being rendered.
- Extracts the WireFeed query with an `ASSET.CHILDREN` tag and the `CODE` parameter set to “WireFeed.”
- Obtains a URL for a page that will display the stories from the WireFeed query with the `RENDER.GETPAGEURL` tag. The `PAGENAME` parameter specifies the page entry of the template to use to create that page and also determines part of the URL. The `OUTSTR` parameter creates a variable named `referURL` to hold the URL that `RENDER.GETPAGEURL` creates.
- Uses the URL from the `referURL` variable to build an `<A HREF>` link to the page.
- Passes the identity of the query asset to the page entry for the `WireSummaryText` template. The `WireSummaryText` template then creates a pagelet that displays the summary text from each article returned by the Wire Feed query and passes the pagelet back to this page, where it is displayed.

For a more complex example of a page asset template, examine the Burlington Financial template named `SectionFront`. You can examine it in two ways:

- Search for and then inspect it in the Content Server interface.
- Use Content Server Explorer to open the template element called:  
`ElementCatalog/BurlingtonFinancial/Page/SectionFront`

This element creates a Section Front page with a navigational bar on the top, a navigational area with links on the left, a list of stories, and so on.



## About Coding Elements that Display Flex Assets

When you code templates for basic assets, you use the CS-Direct `ASSET` tag family. For example, when you want to extract and display a basic asset, you use the `ASSET.LOAD` tag, a tag that extracts data from the primary storage table for that asset type.

Because the database schema for flex assets is different than that for basic assets, CS-Direct Advantage provides additional tag families for flex assets that you use in place of the `ASSET` tags:

- `ASSETSET`. You use this tag family to specify a set of one or more flex assets.
- `SEARCHSTATE`. You use this tag family to create search constraints that filter the assets in an `assetset`.

### Note

The `ASSET.LOAD` tag will load a flex asset for you. However, using the `ASSET.LOAD` tag with flex assets is not supported: the code cannot be upgraded, and extracting the asset in this way is slower by orders of magnitude than using the `ASSETSET` tag family.

When you use the flex asset model to represent your content, your online site will use a mixture of flex and basic assets because the page asset type (which you are likely to use) is a basic asset type.

## Assetsets

An **assetset** is a group of one or more flex assets or flex parent assets. You use the `ASSETSET` tags to create the set of assets and to extract the attribute values that you want to display.

You can retrieve the following information from an `assetset`:

- The values for one attribute for each of the flex assets in the `assetset`.
- The values for multiple attributes for each of the flex assets in the `assetset`.
- A list of the flex assets in the `assetset`
- A count of the flex assets in the `assetset`
- A list of unique attribute values for an attribute for all flex assets in the `assetset`
- A count of unique attribute values for an attribute for all flex assets in the `assetset`

You can create `assetsets` that include flex assets of more than one type, but only if those flex assets use the same flex attribute type.

The most commonly used `ASSETSET` tags are:

```
ASSETSET.SETASSET
ASSETSET.SETSEARCHEDASSETS
ASSETSET.GETMULTIPLEVALUES
ASSETSET.GETATTRIBUTEVALUES
ASSETSET.GETASSETLIST
```

All of the `ASSETSET` tags are described in the *CSEE Developer's Tag Reference* and several of them are used in the code samples in this chapter. For information about

compositional dependencies and the assetset tags, see “The ASSETSET (assetset) Tag Family” on page 476.

## Searchstates

How do you obtain the IDs of the flex assets that you want to display? With searchstate objects.

A **searchstate** is a set of search constraints based on the attribute values held in the `_Mungo` table for the flex asset type. You **apply** searchstates to **assetsets**.

You build a searchstate by adding or removing constraints to narrow or broaden the list of flex assets that are described by the searchstate. For example, the GE Lighting sample site uses searchstates to create drill-down searching features that visitors use to browse through the product catalog.

An unconstrained searchstate applied to an assetset creates an unfiltered list of all the assets of that type. For example, the following code sample would create an assetset that contains all the products in the GE Lighting catalog:

```
<SEARCHSTATE.CREATE NAME="nolimits"/>
<ASSETSET.SETSEARCHEDASSETS NAME="unconstrainedAssetSet"
  CONSTRAINT="nolimits" ASSETTYPES="Products"/>
```

To narrow the number of products in the assetset, you add constraints. For example, the following code sample would create an assetset that contains only the 40-watt lightbulbs from the catalog:

```
<SEARCHSTATE.CREATE NAME="lightbulbs"/>
<SEARCHSTATE.ADDSIMPLESTANDARDCONSTRAINT NAME="lightbulbs"
  ATTRIBUTE="wattage" VALUE="40"/>
<ASSETSET.SETSEARCHEDASSETS NAME="40WattLightbulbs"
  CONSTRAINT="lightbulbs" ASSETTYPES="Products"/>
```

A constraint is a filter (restriction) that can be based on the value of an attribute or it can be based on another searchstate, which is called a nested searchstate.

A searchstate can search either the `_Mungo` table for the asset type database or the attribute indexes created by a search engine for that asset type. This means that you can mix database and rich-text (full-text through an index) searches in the same query. To apply a constraint against a search engine index, use the `SEARCHSTATE.ADDRICHTEXTCONSTRAINT` tag.

### Note

Using SQL to query the flex asset database tables instead of using the `SEARCHSTATE` tag family is not supported.

The most commonly used `SEARCHSTATE` tags are as follows:

```
SEARCHSTATE.CREATE
SEARCHSTATE.ADDSTANDARDCONSTRAINT
SEARCHSTATE.ADDSIMPLESTANDARDCONSTRAINT
SEARCHSTATE.ADDRANGECONSTRAINT
SEARCHSTATE.ADDRICHTEXTCONSTRAINT
SEARCHSTATE.TOSTRING
```

```
SEARCHSTATE.FROMSTRING
```

All of the `SEARCHSTATE` tags are described in the *CSEE Developer's Tag Reference* and several of them are used in the code samples in this chapter.

## Assetsets, Searchstates, and Flex Attribute Types

Because searchstates filter select assets based on attribute values and assetsets are created by applying searchstates to the assets in the database, only those flex asset types that share the same attribute type can be included in the same assetset.

For example, in the GE Lighting sample site, you can create an assetset with both flex articles and flex images in it because they use the same attribute type—content attribute. However, because flex articles use the content attribute type and products use the product attribute type, you cannot create an assetset that contains both flex articles and product assets.

## Scope

The scope of assetsets and searchstates is local; that is, they exist only for the current element (rendered page).

When you want to maintain the existing searchstate, you can use the `SEARCHSTATE.TOSTRING` tag to convert it to a string and then include that string as an argument in the URL for the next page.

For example:

```
<SEARCHSTATE.TOSTRING NAME="ss" VARNAME="stringss"/>
<RENDER.SATELLITEPAGE
    pagename= SiteName/Products/Example
    ARGS_search="Variables.stringss"/>
```

And then, in the root element of this example page that receives the string, you code another searchstate:

```
<SEARCHSTATE CREATE NAME="ss"/>
```

And unpack the string that was passed to the example element with a `SEARCHSTATE.FROMSTRING` tag:

```
<SEARCHSTATE.FROMSTRING NAME="ss" VALUE= "Variables.search"/>
```

## Coding Templates That Display Flex Assets

When you code templates for an online site that uses the flex asset model, you are primarily concerned with the values of flex attributes, which are assets themselves.

A flex asset (a product, for example) or flex parent asset considered in the context of displaying it, is really an abstraction of attribute values.

You use searchstates to obtain the identity of the flex assets that you want to display, filtering the assets under consideration by their attribute values. The result is an assetset of flex assets or flex parent assets that is based on attribute values, and you can then display the attribute values for the assets in the assetset.

Be sure that you understand the data model of the flex family (or families) that you are using before you begin coding template elements for your flex assets. For more information, read Chapter 8, “Data Design: The Asset Models” and Chapter 14, “Designing Flex Asset Types.”

### Example Data Set for the Examples in This Section

The GE Lighting sample site and the CS-Engage extensions to the Burlington Financial sample site illustrate the full power of the flex asset data model and the coding toolset delivered with CS-Direct Advantage. The templates and elements in the sample sites illustrate the code for fully functioning online sites that display a nearly real-world amount of data.

The code examples in this chapter of the *CSEE Developer's Guide* are much simpler than the elements in the sample sites. These examples start with simple assetsets and searchstates (“hello assetset” and “hello searchstate”) that interact with a small, example data set.

The example data set used in these examples is based on the product flex family, as follows:

Flex Asset Type	External Name (as displayed in Content Server interface)	Internal Name (as used in the Content Server database)*
flex attribute	product attribute	PAttributes
flex asset	product	Products
flex parent	product parent	ProductGroups

\* Always use the internal name of the asset type when you use the ASSETTYPES parameter for an ASSETSET tag.

The example products in this example data set are pairs of blue jeans that have the following attributes:

Attribute	Data Type	Number of Values
sku	string	single
color	string	multiple
price	integer	single
style	text	single

There are four pairs of blue jeans, defined as follows:

sku	color	price	style
jeans-1	blue	35	wide
jeans-2	blue,black	30	straight
jeans-3	black,green	25	straight
jeans-4	green	20	wide

## Examples of Assetsets with One Product (Flex Asset)

The code samples in this section do the following:

- Create an assetset that contains one pair of jeans, identified by its `sku` number
- Log a dependency between the product asset and the rendered page(let)
- Get and display the value for the `price` attribute and display it
- Get and display the values for the `color` attribute and display them
- Get and display the values for both the `price` and `color` attribute with the same tag (`ASSETSET.GETMULTIPLEVALUES`)

### Create a Searchstate and Apply It to an Assetset

This line of code creates an unfiltered searchstate named `ss`:

```
<SEARCHSTATE.CREATE NAME="ss" />
```

Next, we can narrow the unfiltered searchstate named `ss` so that it finds a specific product in the sample data set, by providing the `sku` of the product:

```
<SEARCHSTATE.ADDSIMPLESTANDARDCONSTRAINT NAME="ss"
  TYPENAME="PAttributes" ATTRIBUTE="sku" VALUE="jeans-2" />
```

Now we can create an assetset named `as`, applying the searchstate named `ss` to it:

```
<ASSETSET.SETSEARCHEDASSETS NAME="as"
  ASSETTYPES="Products" CONSTRAINT="ss" FIXEDLIST="true" />
```

Since the value of the `sku` attribute is unique for each product asset, there is only one product in the assetset: the one whose `sku` value is `jeans-2`.

Because this searchstate was created by querying for a hard-coded attribute value—a sku value of “jeans-2”—we know the exact contents of the assetset. That is why we set the `FIXEDLIST` parameter to “true.” Now the `ASSETSET.SETSEARCHEDASSET` tag logs a compositional dependency for the product asset.

### Get the Price of the Product

Next, let’s extract the price of this pair of jeans:

```
<ASSETSET.GETATTRIBUTEVALUES NAME="as" ATTRIBUTE="price"
  TYPENAME="PAttributes" LISTVARNAME="pricelist"/>
```

Notice that even though `price` is a single-value attribute (which means the product only has one price), the `ASSETSET.GETATTRIBUTEVALUES` tag returns the value of the price attribute as a list variable (`LISTVARNAME="pricelist"`).

### Display the Price of the Product

Now the following line of code can display the price of the `jeans-2` product:

```
Price: <CSVAR NAME="pricelist.value"/><P/>
```

And this is the result:

Price: 30

### Get the Colors for the Product

Next, let’s determine which colors this pair of jeans is available in.

As specified above, the `color` attribute is a multiple-value attribute. Because the `ASSETSET.GETATTRIBUTEVALUES` tag works the same whether an attribute is a single-value or a multiple-value attribute, we use the tag exactly as we did for single-value price attribute:

```
<ASSETSET.GETATTRIBUTEVALUES NAME="as" ATTRIBUTE="color"
  TYPENAME="PAttributes" LISTVARNAME="colorlist"/>
```

### Display the Colors of the Product

Now the following code can display the colors for the `jeans-2` product, and, because this product can have more than one color, the code loops through the list:

```
Colors: <LOOP LIST="colorlist">
  <CSVAR NAME="colorlist.value"/>&nbsp;
</LOOP><P/>
```

And this is the result:

Colors: black blue

### Create a List Object for the `ASSETSET.GETMULTIPLEVALUES` tag

In general, you should not use the `ASSETSET.GETATTRIBUTEVALUES` tag when you want to get the value for more than one attribute.

The `ASSETSET.GETMULTIPLEVALUES` tag gets and scatters the values from more than one attribute, for all the assets in an assetset. Because the tag makes only one call to the database for all the attribute values, it performs the query more efficiently than using multiple `ASSETSET.GETATTRIBUTEVALUES` tags.

Before you can use this tag, however, you must use the `LISTOBJECT` tags to create a list object that describes the attributes that the `ASSETSET.GETMULTIPLEVALUES` tag will return. The list object needs one row for each attribute that you want to get.

This next line of code creates a list object named `lo` that has columns named `attributetypename`, `attributename`, and `direction`.

```
<LISTOBJECT.CREATE NAME="lo"
COLUMNS="attributetypename,attributename,direction"/>
```

Then, this line adds a row to the list object for each attribute, `color` and `price`:

```
<LISTOBJECT.ADDROW NAME="lo" attributetypename="PAttributes"
attributename="color" direction="none"/>
<LISTOBJECT.ADDROW NAME="lo" attributetypename="PAttributes"
attributename="price" direction="none"/>
```

The next line of code converts the list object to a list variable name `lolist`:

```
<LISTOBJECT.TOLIST NAME="lo" LISTVARNAME="lolist"/>
```

### Get the Value for Both Price and Color with ASSETSET.GETMULTIPLEVALUES

And now we can get the values for both the price and the color attribute from our original `assetset`, named `as`:

```
<ASSETSET.GETMULTIPLEVALUES NAME="as" PREFIX="multi"
LIST="lolist" BYASSET="false"/>
```

### Display the Value of Price and Color for the jeans-2 Product

Now that the values are stored in the list variable (`lolist`), the following code can display all the values for all the attributes:

```
<LOOP LIST="lolist">
  <CSVAR NAME="lolist.attributename is "/>
  <LOOP LIST="multi:lolist.attributename">
    <CSVAR NAME="multi:lolist.attributename.value"/>&nbsp;   
  </LOOP><P/>
</LOOP>
```

This code sets up a nested loop that loops through all the attributes in the `lolist` variable, and then loops through all the distinct attribute values for each of the attributes in the `lolist` list variable.

And this is the result:

```
color is blue black
price is 30
```

## Special Cases: Flex Attributes of Type Text, Blob, and URL

If you want to display the values held in flex attributes of type `text`, `blob`, or `url` (which was deprecated in version 4.0), use the methodologies described in this section.

### Flex Attributes of Type Text

The `ASSETSET.GETMULTIPLEVALUES` tag does not retrieve the values for attributes of type `text`. This means that you must include a separate `ASSETSET.GETATTRIBUTEVALUES` tag for attributes of this type.

For example, if the `color` attribute in the sample data set used in these examples were an attribute of type `text` rather than type `string`, we could not have retrieved its values with the `ASSETSET.GETMULTIPLEVALUES` tag in the preceding examples.

## Flex Attributes of Type Blob

The `blob` attribute type was new in version 4.0 and it replaced the attribute of type `url`.

As previously mentioned in Chapter 8, “Data Design: The Asset Models,” the `_Mungo` table for a flex asset type stores the attribute values for the flex assets of that type and the `ASSETSET` tags query the asset type’s `_Mungo` table for attribute values.

Attributes of type `blob` are an exception:

- CS-Direct Advantage stores all the values of all the attributes of type `blob` in the `MungoBlobs` table.
- A row in the `_Mungo` table (`Products_Mungo`, for example) for an attribute of type `blob` stores only the ID of the row in the `MungoBlobs` table that holds its value. That is, the `blob` column in a `_Mungo` table is a foreign key to the `MungoBlobs` table.

This means that for an attribute of type `blob`, the `ASSETSET.GETATTRIBUTEVALUES` and `ASSETSET.GETMULTIPLEVALUES` tags return the ID of the blob attribute’s value, but not the actual value.

Once the ID of the attribute’s value has been identified, you can do one of two things with it:

- Use the ID to obtain a `BlobServer` URL.
- Use the ID to extract the actual value of the blob.

### Creating a BlobServer URL

To obtain a `BlobServer` URL for the value of the flex attribute `blob`, you do the following:

- Use the `BLOBSERVICE` tags to programmatically identify the `MungoBlobs` table and the appropriate columns in it.
- Pass that information to a `RENDER.SATELLITEBLOB` tag, if you want the URL in an `HTML` tag, or to a `RENDER.GETBLOBURL` tag if you need only the URL without the `HTML` tag.

#### Note

Be sure to use the `BLOBSERVICE` tags to programmatically identify the `MungoBlobs` table, as shown in the following example. By obtaining the value with the `BLOBSERVICE` tags rather than hard coding the name of the table into your code, your code will function properly even if the table name is changed in a future version of the product.

To illustrate the following blob examples, let’s add the following attribute to the jeans products in our sample data set:

Attribute	Data Type	Number of Values
<code>description</code>	<code>blob</code>	<code>single</code>



First, let's create the assetset and log the dependency between the jeans-2 product and the rendered page:

```
<SEARCHSTATE.CREATE NAME="ss" />
<SEARCHSTATE.ADDSIMPLESTANDARDCONSTRAINT NAME="ss"
TYPENAME="PAttributes" ATTRIBUTE="sku" VALUE="jeans-2" />
<ASSETSET.SETSEARCHEDASSETS NAME="as" ASSETTYPES="Products"
CONSTRAINT="ss" />
<ASSETSET.GETASSETLIST NAME="as" LISTVARNAME="aslist" />
<RENDER.LOGDEP cid="aslist.assetid" c="aslist.assettype" />
```

The next line of code gets the ID of the jeans-2 asset's description attribute (that attribute of type blob) and stores it in a list variable called descFile

```
<ASSETSET.GETATTRIBUTEVALUES NAME="as" TYPENAME="PAttributes"
ATTRIBUTE="description" LISTVARNAME="descFile" />
```

The next lines of code use the BLOBSERVICE tags to obtain the table name and column names from the CS-Direct Advantage table that stores the attribute values for blob attributes and store them in variables named "uTabname", "idColumn", and "uColumn":

```
<BLOBSERVICE.READDATA ID="descFile.value" LISTVARNAME="descData" />
<CSVAR NAME="descData.@urldata" />
<BLOBSERVICE.GETTABLENAME VARNAME="uTabname" />
<BLOBSERVICE.GETIDCOLUMN VARNAME="idColumn" />
<BLOBSERVICE.GETURLCOLUMN VARNAME="uColumn" />
```

Now we can pass the list variable named descFile and the uTabname, idColumn, and uColumn variables to a RENDER.SATELLITEBLOB tag, which returns a BlobServer URL in an HTML tag:

```
<RENDER.SATELLITEBLOB
  BLOBTABLE="Variables.uTabname"
  BLOBWHERE="descData.@urldata"
  BLOBKEY="Variables.idColumn"
  BLOBCOL="Variables.uColumn"
  BLOBHEADERNAME1="application/pdf"
  BLOBHEADERVALUE1="a CLASS='thumbhead' href" />
  <CSVAR NAME="View Description (PDF)" /> <![CDATA[</a>]]>
```

The RENDER.SATELLITEBLOB tag returns a BlobServer URL in an HREF tag (SERVICE="a CLASS='thumbhead' href") and the CSVAR tag displays the link.

### Getting and Displaying the Value of the Blob

To obtain and display the contents or data in the flex attribute blob after its ID has been returned, you use a BLOBSERVICE.READDATA tag, which loads the file name and URL data of the blob.

Under the same assumptions about the data set that we used for the preceding blob example, let's create the assetset, log the dependency between the jeans-2 asset and the rendered page, and get the ID of the description attribute's value:

```
<SEARCHSTATE.CREATE NAME="ss" />
<SEARCHSTATE.ADDSIMPLESTANDARDCONSTRAINT NAME="ss"
TYPENAME="PAttributes" ATTRIBUTE="sku" VALUE="jeans-2" />
```

```
<ASSETSET.SETSEARCHEDASSETS NAME="as" ASSETTYPES="Products"
CONSTRAINT="ss" />
<ASSETSET.GETASSETLIST NAME="as" LISTVARNAME="aslist" />
<RENDER.LOGDEP cid="aslist.assetid" c="aslist.assettype" />
<ASSETSET.GETATTRIBUTEVALUES NAME="as" TYPENAME="PAttributes"
ATTRIBUTE="description" LISTVARNAME="descFile" />
```

This time, we want to get and then display the value (data) of the description attribute, so we have to use the `BLOBSERVICE.READDATA` tag:

```
<BLOBSERVICE.READDATA ID="descFile.value" LISTVARNAME="descData" />
<CSVAR NAME="descData.@urldata" />
```

## Flex Attributes of Type URL

Attributes of type `url` were deprecated in the 4.0 version of the product. You should use attributes of type `blob`, instead.

However, if you have upgraded from a version 3.6.3 and you have attributes of type `url` whose values you want to display, be sure that you complete these extra coding steps:

- Obtain the value of the property that sets the `defdir` for the URL columns in the CS-Direct Advantage tables and store it in a variable.
- Use the variable with an `INSERT` tag rather than a `CSVAR` tag.

This time, let's assume that the ID of the asset has been passed to this element in a `cid` variable and that the description attribute is of type `url` rather than of type `blob`.

When the `cid` variable is set, you can create the assetset like this:

```
<ASSETSET.SETASSET NAME="as" TYPE="Products"
ID="Variables.cid" />
```

The next line of code obtains the value of the description attribute (which is of type `url` in this example):

```
<ASSETSET.GETATTRIBUTEVALUES NAME="as" ATTRIBUTE="urlattr"
LISTVARNAME="attr_list" />
```

Now we need the value of the `cc.urlattrpath` property from the `gator.ini` file:

```
<PROPERTY.GET INIFILE="gator.ini" PARAM="cc.urlattrpath"
VARNAME="path" />
```

And finally, we use the `INSERT` tag rather than the `CSVAR` tag to display the value of the description attribute:

```
<INSERT URL="Variables.pathattr_list.value" />
```

## Examples of Assetsets with More Than One Product (Flex Asset)

The code samples in this section do the following:

- Create an assetset that holds all the products (pairs of jeans) in the sample data set being used in this chapter.
- Get and display a count of the number of jeans in the assetset.
- Get and display all the values for the `color` attribute for all the pairs of jeans in the assetset.

- Get and display all the values for both the `color` and the `style` attributes for the jeans in the `assetset`.
- Get and display, in a table, all the attribute values for the jeans in the `assetset`.
- Add a search constraint that filters the `assetset` for the jeans whose price falls into a specific range.
- Replace the range constraint on the price attribute with a search constraint that filters the `assetset` for the jeans that are available in any color that begins with the letter “b.”
- Replace that color constraint with one that filters the `assetset` for the jeans that are available in either of two specific colors: blue or black

## Create a Searchstate and Apply it to an Assetset

This line of code creates an unfiltered searchstate named `ss`:

```
<SEARCHSTATE.CREATE NAME="ss" />
```

When you apply the unfiltered searchstate to an assetset, you get all the flex assets of the type specified (in this case, product assets):

```
<ASSETSET.SETSEARCHEDASSETS NAME="as" CONSTRAINT="ss"
ASSETTYPES="Products"/>
```

## Display the Number of Assets in the Assetset

These lines of code return and display a count of the number of assets in the assetset, which at this point represents the entire sample catalog:

```
<ASSETSET.GETASSETCOUNT NAME="as" VARNAME="count"/>
How many products are in the catalog?
<CSVAR NAME="Variables.count"/><P/>
```

And this is the result:

How many products are in the catalog? 4

### Display the Colors That the Jeans Are Available In

The next lines of code get and display the different colors for the jeans. In other words, the distinct values of the `color` attribute:

```
<ASSETSET.GETATTRIBUTEVALUES NAME="as" ATTRIBUTE="color"
TYPENAME="PAttributes" LISTVARNAME="colors"/>
```

What are the possible colors for any pair of jeans?

[illegible]

And this is the result:

What are the possible colors for any pair of jeans?  
black blue green

## Display Both the Colors and the Styles for the Jeans in the Assetset

Next, let's extract and display the values for both the `color` and the `style` attribute for the jeans in the `assetset`. This time we use the `ASSETSET.GETMULTIPLEVALUES` tag.

First, however, we need to create a list object for the resultset that the `ASSETSET.GETMULTIPLEVALUES` tag returns. The list object needs one row for each of the attributes, as follows:

```
<LISTOBJECT.CREATE NAME="lo"
COLUMNS="attributename,attributetypename,direction"/>
<LISTOBJECT.ADDROW NAME="lo" attributename="color"
attributetypename="PAttributes" direction="none"/>
<LISTOBJECT.ADDROW NAME="lo" attributename="style"
attributetypename="PAttributes" direction="none"/>
```

The next line of code converts the list object to a list variable named `lolist`:

```
<LISTOBJECT.TOLIST NAME="lo" LISTVARNAME="lolist"/>
```

Now we can extract the attributes and store them in the list variable named `lolist`:

```
<ASSETSET.GETMULTIPLEVALUES NAME="as" LIST="lolist"
PREFIX="distinct" BYASSET="false"/>
```

Notice the `BYASSET` parameter in the preceding line of code. Because there is more than one asset in the assetset and we want to know the distinct values for the attribute rather than all the attribute values for each asset in the assetset, `BYASSET="false"`. This way, we get only the unique attribute values and not every single attribute value.

The next lines of code loop through the list and display the unique values for each attribute:

```
Here are all the possible colors:
<LOOP LIST="distinct:color">
    <CSVAR NAME="distinct:color.value"/>&nbsp;  
</LOOP><P/>

Here are all the possible styles:
<LOOP LIST="distinct:style">
    <CSVAR NAME="distinct:style.value"/>&nbsp;  
</LOOP><P/>
```

And this is the result:

```
Here are all the possible colors: green blue black
Here are all the possible styles: wide straight
```

### Create a Table That Displays All the Jeans and Their Attribute Values

You can also use the `ASSETSET.GETMULTIPLEVALUES` tag to obtain the attribute values that are distinct for each asset in the assetset. It creates a list of all the products and the values for their attributes that we can use to create a grid or table that displays all the products in the example catalog.

In this case, we have to do two additional things:

- Because we want the attribute values grouped by the asset that they belong to, the `BYASSET` parameter must be set to `"true"`.
- Because we need the IDs of the assets in this case, we need to use the `ASSETSET.GETASSETLIST` tag to obtain them.

First, this code creates a list object:

```
<LISTOBJECT.CREATE NAME="lo"
COLUMNS="attributename,attributetypename,direction"/>
```

```

<LISTOBJECT.ADDROW NAME="lo" attributename="color"
attributetypename="PAttributes" direction="none"/>
<LISTOBJECT.ADDROW NAME="lo" attributename="style"
attributetypename="PAttributes" direction="none"/>
<LISTOBJECT.ADDROW NAME="lo" attributename="price"
attributetypename="PAttributes" direction="none"/>
<LISTOBJECT.ADDROW NAME="lo" attributename="sku"
attributetypename="PAttributes" direction="none"/>
<LISTOBJECT.TOLIST NAME="lo" LISTVARNAME="lolist"/>

```

Next, we can get the attribute values:

```

<ASSETSET.GETMULTIPLEVALUES NAME="as" LIST="lolist"
PREFIX="grid" BYASSET="true"/>

```

And then we use the `ASSETSET.GETASSETLIST` tag.

```

<ASSETSET.GETASSETLIST NAME="as" LISTVARNAME="aslist"/>

```

It returns a list with these columns:

- assettype
- assetid

By using both lists, we can create a grid that shows all of the products and all of their attribute values:

```

<TABLE>
<LOOP LIST="aslist">
  <TR>
    <TD><CSVAR NAME="grid:aslist.assetid:sku.value"/></TD>
    <TD><CSVAR NAME="grid:aslist.assetid:price.value"/></
  TD>
    <TD><CSVAR NAME="grid:aslist.assetid:style.value"/></
  TD>
    <TD>
      <IF
COND="IsList.grid:aslist.assetid:color=true"><THEN>
      <LOOP LIST="grid:aslist.assetid:color">
        <CSVAR NAME="grid:aslist.assetid:color.value"/
      >&nbsp;
      </LOOP>
      </THEN></IF>
    </TD>
  </TR>
</LOOP>
</TABLE>

```

And this is the result:

jeans-1	35	wide	blue
jeans-2	30	straight	black blue
jeans-3	25	straight	black green
jeans-4	20	wide	green

### Search for Jeans Based on a Range of Prices

Up until now, we have been using the same assetset (NAME="as") that was created in the second line of code in this section. Next, let's filter the assetset by the price attribute, using a range constraint.

This line of code adds a range constraint to our original searchstate (NAME="ss") that was created in the first line of code in this section:

```
<SEARCHSTATE.ADDRANGECONSTRAINT NAME="ss" ATTRIBUTE="price"
  TYPENAME="PAttributes" LOWER="0" UPPEREQUAL="30"/>
```

The range is from 0 to 30. Let's apply the modified searchstate against our assetset:

```
<ASSETSET.SETSEARCHEDASSETS NAME="as" CONSTRAINT="ss"
  ASSETTYPES="Products"/>
```

And check whether it worked, by obtaining and displaying a count of the jeans that are now in the assetset:

```
<ASSETSET.GETASSETCOUNT NAME="as" VARNAME="count"/>
How many jeans products are less than or equal to $30?
<CSVAR NAME="Variables.count"/><P/>
```

And here's the result:

How many jeans products are less than or equal to \$30? 3

### Search for Jeans with a Wildcard for Color

Now let's replace the range constraint on the price attribute with a search constraint that filters the assetset for the jeans that are available in any color that begins with the letter "b."

First this line of code deletes the range constraint for price:

```
<SEARCHSTATE.DELETECONSTRAINT NAME="ss" ATTRIBUTE="price"/>
```

And this line of code adds a new constraint for color, using the percentage (%) character as a wildcard with the VALUE parameter:

```
<SEARCHSTATE.ADDSIMPLELIKECONSTRAINT NAME="ss"
  ATTRIBUTE="color" TYPENAME="PAttributes" VALUE="b%"/>
```

The VALUE="b%" statement means "any color that begins with the letter "b." Lets apply the modified searchstate against our same assetset (as):

```
<ASSETSET.SETSEARCHEDASSETS NAME="as" CONSTRAINT="ss"
  ASSETTYPES="Products"/>
```

And check whether it worked by obtaining and displaying a count of the number of jeans that are in the assetset now:

```
<ASSETSET.GETASSETCOUNT NAME="as" VARNAME="count"/>
How many jeans have a color that begins with the letter "b"?
<CSVAR NAME="Variables.count"/><P/>
```

Here's the result:

How many jeans have a color that begins with the letter "b"? 3

### Search for Jeans with Specific Colors

Finally, let's change the color constraint that filters the assetset for the jeans that are available in either of two specific colors: blue or black

This line of code deletes the color constraint from the searchstate:

```
<SEARCHSTATE.DELETECONSTRAINT NAME="ss" ATTRIBUTE="color"/>
```

Next, because we want to filter based on two values for the color attribute, we need to create a list object with those values:

```
<LISTOBJECT.CREATE NAME="lo" COLUMNS="value"/>
<LISTOBJECT.ADDROW NAME="lo" value="blue"/>
<LISTOBJECT.ADDROW NAME="lo" value="black"/>
<LISTOBJECT.TOLIST NAME="lo" LISTVARNAME="colorlist"/>
```

Now we can use the list variable named `colorlist` to create the searchstate:

```
<SEARCHSTATE.ADDSTANDARDCONSTRAINT NAME="ss" ATTRIBUTE="color"
  TYPENAME="PAttributes" LIST="colorlist"/>
```

The `LIST="colorlist"` statement is the equivalent of the `VALUE` statement in the preceding example. It means “attribute values that match any of the colors in the list named `colorlist`”. Let’s apply the modified searchstate to our same assetset:

```
<ASSETSET.SETSEARCHEDASSETS NAME="as" CONSTRAINT="ss"
  ASSETTYPES="Products"/>
```

And check whether it worked by obtaining and displaying a count of the number of jeans that are in the assetset now:

```
<ASSETSET.GETASSETCOUNT NAME="as" VARNAME="count"/>
How many products have a color that is black or blue?
<CSVAR NAME="Variables.count"/><P/>
```

Here’s the result:

How many products have a color that is black or blue? 3

## Creating URLs for Hyperlinks

Whether your site is dynamic or static, the fact that you are using a CSEE system indicates that your content changes regularly. That means that you cannot hard code URLs into hyperlinks. Your pages must be able to determine the identity of the assets they are providing links to when the page is rendered, either by the Export to Disk publish method or by a visitor’s browser on a dynamic site.

CS-Direct provides three tags (each with an XML and a JSP version) that you can use to create your URLs:

- For URLs for assets that are not blobs, use `RENDER.GETPAGEURL` tag.
- For URLs for assets that are blobs, use either the `RENDER.SATELLITEBLOB` tag or the `RENDER.GETBLOBURL` tag.

### RENDER.GETPAGEURL (render:getpageurl)

To obtain URLs for regular assets (that is, assets that are not blobs), use the `RENDER.GETPAGEURL` tag.

The `RENDER.GETPAGEURL` tag processes arguments passed in from the element that invokes it into a URL-encoded string that it returns as a variable that you name with the `OUTSTR` parameter. By convention, the name of that variable is `referURL`.

If rendermode is set to `export`, it creates a static URL (unless you specify that it should be dynamic). If rendermode is set to `live`, it creates a dynamic URL.

For example:

```
<RENDER.GETPAGEURL PAGENAME="BurlingtonFinancial/Article/Full
    cid="Variables.cid"
    c="Article"
    p="Variables.p"
    OUTSTR="referURL" />
```

You can now use the value in the `referURL` variable to create a hyperlink with an `<A HREF>` tag.

For more information about this tag, see the *CSEE Developer's Tag Reference*.

## RENDER.SATELLITEBLOB (render:satelliteblob)

Binary large objects (blobs) that are stored in the Content Server database are served by the BlobServer servlet rather than the ContentServer servlet. The `RENDER.SATELLITEBLOB` tag returns an HTML tag with a BlobServer URL in it.

This tag takes a set of arguments that define the blob and an additional set of arguments that determine how to format the blob. For example, you can use it to create an `<IMG SRC>` tag or an `<A HREF>` tag, as follows:

```
<RENDER.SATELLITEBLOB
    BLOBTABLE="ImageFile"
    BLOBKEY="id"
    BLOBCOL="urlpicture"
    BLOBWHERE="Variables.asset:id"
    BLOBHEADER="Variables.asset:mimetype"
    SERVICE="IMG SRC"
    ARGS_alt="Variables.asset:alttext"
    ARGS_hspace="5" ARGS_vspace="5" />
```

Note that there are additional coding steps if you are creating a URL for a flex attribute of type blob. For information, see “Flex Attributes of Type Blob” on page 496.

For a longer example, examine the Burlington Financial imagefile template named `TeaserSummary`. You can examine it in two ways:

- Search for and then inspect it in the Content Server interface.
- Use Content Server Explorer to open the template element called:  
`ElementCatalog/BurlingtonFinancial/ImageFile/TeaserSummary.`

Even if you are not using CS-Satellite, you should still use the `RENDER.SATELLITEBLOB` tag because the tag can create a BlobServer URL in an HTML tag even when CS-Satellite is not present.

For more information about this tag, see the *CSEE Developer's Tag Reference*.



## RENDER.GETBLOBURL (render:getbloburl)

If you need a BlobServer URL only, without it being embedded in an HTML tag, use the `RENDER.GETBLOBURL` tag.

For example, the Burlington Financial element named `SetHTMLHeader` uses the `RENDER.GETBLOBURL` element to obtain a BlobServer URL (stored as a variable named `referURL`) that it then passes on to JavaScript code that runs on the client side to determine which browser the visitor is using. In this case, the client-side JavaScript creates the HTML tag based on the browser it discovers, so it needs the BlobServer URL without an HTML tag.

The `SetHTMLHeader` element is the element for a CSElement. You can examine it in two ways:

- Use the Content Server interface to search for the BurlingtonFinancial/Common/SetHTMLHeader CSElement and then inspect it.
- Use Content Server Explorer to open the element called:  
`ElementCatalog/BurlingtonFinancial/Common/SetHTMLHeader`

Note that there are additional coding steps if you are creating a URL for a flex attribute of type `blob`. For information, see “Flex Attributes of Type Blob” on page 496.

For more information about the `RENDER.GETBLOBURL` tag, see the *CSEE Developer's Tag Reference*.

## Using the referURL Variable

The `RENDER.GETPAGEURL`, `RENDER.GETBLOBURL`, and `RENDER.SATELLITEBLOB` tags were introduced in the 3.6.x version of CS-Direct. Older versions of the product used elements named `GetPageURL` and `GetBlobURL` to obtain URLs; they are coded to return URLs in a variable named `referURL`.

By convention, all of the sample code in the sample sites that use the tags that replaced the `GetPageURL` and `GetBlobURL` elements use a `referURL` variable for the value of the URL.

Do not append or add any text to the value held in the `referURL` variable or any other variable returned by a `RENDER.GETPAGEURL` or `RENDER.GETBLOBURL` tag. URLs in this kind of variable are complete (whole). If you change the URL returned by the tag, you are likely to break it.

If you need to include additional arguments in a URL, use the `RENDER.PACKARGS` tag to URL-encode them ("pack" them) and then pass those encoded arguments to the `RENDER.GETPAGEURL` or `RENDER.GETBLOBURL` tag with the `PACKEDARGS` parameter.

For information about the `RENDER.PACKARGS` tag, see the *CSEE Developer's Guide*.

## Handling Error Conditions

While you code your elements, you should also include code that checks for error conditions. You decide which error conditions are serious and, when necessary, code a solution or alternate action. Sometimes the solution is to write a meaningful error message. As an additional step, you can include code that stops a broken page from being cached.

### Note

While you are debugging your code, don't forget that you can use the Page Debugger utility. There are also additional debugging properties on the **Debug** tab in the `futuretense.ini` file that you can enable, if necessary. When you enable these properties, additional error and debugging messages are then written to the `futuretense.txt` log file, which is located in the Content Server installation directory.

For information about the debugging properties, see the properties chapter in the *CSEE Administrator's Guide*. For information about the Page Debugger tool, see Chapter 5, "CSEE Tools and Utilities."

## Using the Errno Variable

The `errno` variable, a standard Content Server variable, holds error numbers that the CSEE XML and JSP tags report. When a CSEE tag cannot successfully execute, it sets `errno` to the value that best describes the reason why it did not succeed. For example, an `errno` value of -13004 means a `CURRENCY` tag couldn't read a number because it was not in the correct currency format. For a complete list of all the `errno` values and their descriptions, see the error conditions section in the *CSEE Developer's Tag Reference*.

The tags that are delivered with the CS content applications clear `errno` before they execute so you do not need to set `errno` to 0 when you want to check for errors from these tags. Here's a code example that determines whether an `ASSET.LOAD` was successful before attempting to load the child assets:

```
<ASSET.LOAD NAME="topArticle" TYPE="Article"
OBJECTID="Variables.cid"/>
  <IF COND="IsError.Variables.errno=false">
    <THEN>
      <ASSET.CHILDREN NAME="topArticle"
LIST="listOfChildren"/>
    </THEN>
  </IF>
```

If you want to check the results of the tags that are delivered by Content Server, you must include code that clears the value `errno` before the tag whose results you want to check. For example:

```
<SETVAR NAME="errno" VALUE="0"/>
```

For a longer example, see the Burlington Financial CSElement named `BurlingtonFinancial/Util/Account/SignUp`. This CSElement provides the code that adds members to the site and updates existing member's information. It checks for several error conditions and provides appropriate responses to them.

The following code sample shows an error message that you could use while you are in the process of developing your templates:

```
<IF rendermode="preview">
  <THEN>
    <IF COND="IsError.Variables.errno=true">
      <THEN>
        <FONT COLOR="#FF0000">
          Error <CSVAR NAME="Variables.errno"/>
          while rendering <CSVAR NAME="pagename"/>
          with asset ID <CSVAR NAME="Variables.cid"/>.
        </FONT>
      </THEN>
    </IF>
  </THEN>
</IF>
```

## Ensuring that Incorrect Pages Are Not Cached

If you can determine that the output from an element is incorrect, there is probably no need for Content Server or CS-Satellite to cache the page. You can stop the page that is being generated from being cached with the `ics.disablecache` tag.

### Example 1: Error Condition

To continue with the first example in “Using the Errno Variable” on page 506, if the article asset could not be loaded, there would also be no reason to cache the page. You could add the following `ELSE` statement to the `IF` condition in that code sample:

```
<ASSET.LOAD NAME="topArticle" TYPE="Article"
OBJECTID="Variables.cid"/>
  <IF COND="IsError.Variables.errno=false">
    <THEN>
      <ASSET.CHILDREN NAME="topArticle"
        LIST="listOfChildren"/>
    </THEN>
  <ELSE>
    <ics.disablecache/>
  </ELSE>
</IF>
```

### Example 2: Clear the Page From Cache if the Asset’s Status is VO (Basic Assets Only)

As described in “CacheManager and Mirror to Server Publish Sessions” on page 474, the CacheManager on the destination system regenerates all the pages and pagelets that were affected by a publishing session. “Affected pages” includes those whose dependent assets were deleted.

Deleted assets have their status set to VO. The `ASSET.LOAD` and `asset:load` tags do not check the status of an asset before they execute which means they can and will load a deleted asset. Typically this isn’t a problem. Why? Because an asset cannot be deleted until all links to it from other assets are removed. Therefore, when the site is regenerated there are no longer any links to a page or pagelet that would display the deleted asset. But there is no need to leave a page or pagelet that displays a deleted asset in the cache.

The following code sample stops the page from being cached if the asset cannot be loaded or if the asset's status is deleted:

```
<ASSET.LOAD TYPE="Variables.c" OBJECTID="Variables.cid"
NAME="WireStoryTextArticle"/>
<!-- if the asset cannot be loaded, then flush the pagelet from
cache -->
    <if COND="IsError.Variables.errno=true">
        <then>
            <ics.disablecache/>
        </then>
    </if>
<ASSET.SCATTER NAME="WireStoryTextArticle" PREFIX="asset"/>
<!-- if the asset is marked as void, then flush the pagelet
from cache -->
    <if COND="Variables.asset:status=VO">
        <then>
            <ics.disablecache/>
        </then>
    </if>
```

Note that you do not need to include code that checks the status of flex assets. The `SEARCHSTATE` and `searchstate` tags do not return assets that have a status of VO and the `ASSETSET` and `assetset` tags do not include assets that have a status of VO in the assetsets that they create.

## Chapter 22

# Template Element Examples for Basic Assets

This chapter uses examples from the Burlington Financial sample site to illustrate the information presented in Chapter 21, “Coding Elements for Templates and CSElements.” It contains the following sections:

- Example 1: Basic Modular Design
- Example 2: Coding Links to the Article Assets in a Collection Asset
- Example 3: Using the ct Variable
- Example 4: Coding Templates for Query Assets
- Example 5: Displaying an Article Asset Without a Template
- Example 6: Displaying Site Plan Information
- Example 7: Displaying Non-Asset Information

All of the elements described in this section are from the Burlington Financial sample site.

## Example 1: Basic Modular Design

The Burlington Financial sample site is an example of a modular site design that takes advantage of common elements so that common code is written once but reused in several locations or contexts. Following is a description of how one area on the Burlington Financial home page is created from five separate elements.

First, open the Content Server interface, select the Burlington Financial site and preview the Home page asset. You can either search for the asset and select **Preview** from the drop-down list on the icon bar or you can expand the **Placed Pages** icon under the **Burlington Financial** node in the **Site Plan** tab, select the **Home** page, and then select **Preview** from the right-mouse menu.

CS-Direct displays the Burlington Financial home page in your browser.

Directly under the date, there is a column that displays the main stories of the day. There is a summary paragraph and byline for each story in the list. The titles of the stories are hyperlinks to the full story. Several of the stories, including the first story in the list, also present a photo:



### Trio to Buy Veba Electronics Group

Combining Arrow and Wyle will create a formidable force in terms of demand creation and engineering. Arrow Electronics, Aynet and Schroder Ventures will buy Veba Electronics.

### Williams Agrees to Purchase Dow's Interest in Cochin Pipeline

The sale of the Cochin pipeline is a key link in Williams' strategy to develop a comprehensive transportation, storage and distribution network to every major NGL market in North America.



### Media1st.Com, Enron Unveil Alliance

Enron's broadband network will be combined with Media1st.com's video-enabled email service, virtual video portal, complete webcasting production and services capabilities, and content syndication model.



### Go.Com Beats Street After the Bell

Go.Com Beats Street After the Bell. The company also announced that, effective August 7, it will change its name to Disney Internet Group. Web portal Yahoo! fell 5/16 to 127 1/8

This example describes how the first story in the list is identified, selected, positioned at the top of the list, and formatted.

These are the elements used to format the first story in the list:

- BurlingtonFinancial/Page/Home
- BurlingtonFinancial/Collection/MainStoryList
- BurlingtonFinancial/Article/LeadSummary
- BurlingtonFinancial/ImageFile/TeaserSummary

## First Element: Home

The Home page of the of the Burlington Financial sample site uses a template that is also named Home. You can examine it in two ways:

- Search for and then inspect it in the Content Server interface.
- Use Content Server Explorer to open the template element called:

ElementCatalog/BurlingtonFinancial/Page/Home

First, the Home element loads the home page asset, names it HomePage, and then scatters the information in its fields:

```
<satellite.tag type="open"/>
<ASSET.LOAD TYPE="Variables.c" OBJECTID="Variables.cid"
NAME="HomePage"/>
<ASSET.SCATTER NAME="HomePage" PREFIX="asset"/>
```

The value for cid is passed in from the Burlington Financial URL and the value for c is available because it is set as a variable in the resarg1 column in the SiteCatalog page entry for the Home template.

### Note

The `<satellite.tag type="open"/>` statement begins this element because it uses `RENDER.SATELLITEPAGE` and `RENDER.SATELLITEBLOB` tags. When you use CS-Satellite tags or their CS-Direct equivalents in an element, you start the element with a `<satellite.tag type="open"/>` statement and end the element with a `<satellite.tag type="close"/>` statement. For more information about CS-Satellite tags see the *CSEE Developer's Tag Reference*.

Scroll down past several `callelement` and `RENDER.SATELLITEPAGE` tags to the following `ASSET.CHILDREN` tag:

```
<ASSET.CHILDREN NAME="HomePage" LIST="MainStories"
CODE="TopStories"/>
```

With this code, Home obtains the collection asset identified as the page asset's TopStories collection (`CODE="TopStories"`) and creates a list named MainStories to hold it (`LIST="MainStories"`).

Next, Home determines whether it successfully obtained the collection and then calls for the page entry of the MainStoryList template.

```
<IF COND = "IsList.MainStories=true">
<THEN>
<RENDER.SATELLITEPAGE pagename="BurlingtonFinanical/Collection/
MainStoryList"
ARGS_cid="MainStories.oid"
ARGS_p="Variables.asset:id"/>
<THEN/>
<IF/>
```

Notice that Home passes the identity of the list that holds the collection to MainStories with `ARGS_cid` and the identity of the Home page asset with `ARGS_p="Variables.asset:id"`.

## Second Element: MainStoryList

The MainStoryList page entry invokes its root element. Use Content Server Explorer to open and examine this element:

ElementCatalog/BurlingtonFinancial/Collection/MainStoryList.xml

The MainStoryList element is the template element (the root element) for the MainStoryList template asset, a template that formats collection assets.

This element creates the framework for the Home page column that holds the main list of stories, and then fills that column with the articles from the TopStories collection. It uses two templates to format those articles:

- LeadSummary for the first article in the collection (the top-ranked article)
- Summary for the rest of the articles

Because the purpose of this example is to describe how the first story in the list is displayed, this example discusses only the LeadSummary template element.

MainStoryList loads and scatters the collection that Home passed to it:

```
<ASSET.LOAD TYPE="Variables.c" OBJECTID="Variables.cid"
    NAME="MainStoryListCollection"/>
<ASSET.SCATTER NAME="MainStoryListCollection" PREFIX="asset"/>
```

It then extracts the articles from the collection, creates a list to hold them, ordering them by their rank:

```
<ASSET.CHILDREN NAME="MainStoryListCollection"
    LIST="theArticles"
    ORDER="nrank" CODE="-" />
```

And then it calls for the page entry of the LeadSummary template:

```
<RENDER.SATELLITEPAGE PAGENAME="BurlingtonFinancial/Article/
    LeadSummary"
    ARGS_cid="theArticles.oid"
    ARGS_ct="Full"
    ARGS_p="Variables.p"/>
```

Once again, this element passes on several pieces of information:

- The identity of the list that holds the articles (ARGS\_cid)
- The name of the template to use when creating the link to each of the articles (ARGS\_ct)
- The identity of the originating page asset (ARGS\_p), which is Home.

Because the list was ordered by rank and this code does not loop through the list, the value in ARGS\_cid (theArticles.oid) is the object ID of the highest ranked article in the collection because that article is the first article in the list.



### Third Element: LeadSummary

The LeadSummary page entry invokes its root element (which is the template element for the LeadSummary template). Use Content Server Explorer to open and examine it:

ElementCatalog/BurlingtonFinancial/Article/LeadSummary.xml

This element formats the first article in the TopStories collection. It does the following:

- Retrieves the image file associated with the first article through the TeaserImage association.
- Invokes the TeaserSummary element to obtain the formatting code for the image.
- Uses a `RENDER.GETPAGEURL` tag to obtain the URL for the first article in the collection.
- Displays the imagefile asset, the title of the article as a hyperlink to the full article, the summary paragraph, and the byline.

First LeadSummary loads the article and names it LeadSummaryArticle:

```
<ASSET.LOAD TYPE="Variables.c" OBJECTID="Variables.cid"
NAME="LeadSummaryArticle"/>
<ASSET.SCATTER NAME="LeadSummaryArticle" PREFIX="asset"/>
```

It obtains the assets associated with the article as its Teaser imagefile asset, creating a list for that file named “TeaserImage”:

```
<ASSET.CHILDREN NAME="LeadSummaryArticle" LIST="TeaserImage"
CODE="TeaserImageFile"/>
```

Finally, it calls the page entry for the TeaserSummary template, passing it the ID of the imagefile asset held in the list:

```
<THEN>
<RENDER.SATELLITEPAGE PAGENAME="BurlingtonFinancial/ImageFile/
TeaserSummary"
ARGS_cid="TeaserImage.oid"/>
</THEN>
</IF>
```

### Fourth Element: TeaserSummary

The TeaserSummary page entry invokes its root element, the template element for the TeaserSummary template. Use Content Server Explorer to open and examine it:

ElementCatalog/BurlingtonFinancial/ImageFile/TeaserSummary

Because imagefile assets are blobs stored in the Content Server database, and blobs stored in the database must be served by the BlobServer servlet rather than the ContentServer servlet, this element obtains an HTML tag that uses a BlobServer URL.

Scroll down to the following `RENDER.SATELLITEBLOB` tag:

```
<RENDER.SATELLITEBLOB BLOBTABLE="ImageFile" BLOBKEY="id"
BLOBCOL="urlpicture" BLOBWHERE="Variables.asset:id" BLOBHEADER=
"Variables.asset:mimetype" SERVICE="IMG SRC" ARGS_alt=
"Variables.asset:alttext" ARGS_hspace="5" ARGS_vspace="5" />
```

The tag creates an HTML `<IMG SRC>` tag. The SRC is the blob in the `ImageFile` table identified through the ID passed in with `BLOBWHERE="Variables.asset:id"` and both its horizontal and vertical spacing are at five pixels.

When `TeaserSummary` is finished, `LeadSummary` continues.

## Back to LeadSummary

When `LeadSummary` resumes, having obtained the teaser image for the first article in the `TopStories` collection, it uses `RENDER.GETPAGEURL` to obtain the URL for that article:

```
<RENDER.GETPAGEURL PAGENAME="BurlingtonFinancial/Article/
Variables.ct"
    cid="Variables.cid"
    c="Article"
    p="Variables.p"
    OUTSTR="referURL"/>
```

Remember that when the `MainStoryList` element called the page entry for `LeadSummary`, it passed a `ct` variable set to `Full`. Therefore, the page name that `LeadSummary` is passing to `RENDER.GETPAGEURL` is really `BurlingtonFinancial/Article/Full`.

`RENDER.GETPAGEURL` creates the URL for the article based on the information passed in to it and then returns that URL to `LeadSummary` in a variable called `referURL`, as specified by the `OUTSTR` parameter.

`LeadSummary` uses the `referURL` variable in an HTML `<A HREF>` tag and then displays the link, the abstract of the article, and the byline:

```
<A class="featurehead" HREF="Variables.referURL"
REPLACEALL="Variables.referURL">
<csvar NAME="Variables.asset:description"/></A>
   <BR/>
<span class="thumbtext"><csvar NAME="Variables.asset:abstract"/>
>
</span><BR/>
<span class="thumbcredit"><csvar NAME="Variables.asset:byline"/>
>
</span><BR/>
```

Note the use of the `REPLACEALL` tag as an attribute in the HTML `<A HREF>` tag. You must use this tag as an attribute when you want to use XML variables in HTML tags.

Now that `LeadSummary` is finished, `MainStoryList` continues.

## Back to MainStoryList

Next `MainStoryList` loops through the rest of the articles in the `TopStories` collection and uses the `Summary` template to format them.

If you are interested, use `Content Server Explorer` to open and examine it:

```
ElementCatalog/Article/Summary
```

When `MainStoryList` is finished, `Home` continues.

## Back to Home

Home resumes, with a call to the WireFeedBox page entry.

### Note

The Home element ends with a `<satellite.tag type="close" />` statement. For more information about CS-Satellite tags see the *CSEE Developer's Tag Reference*.

## Example 2: Coding Links to the Article Assets in a Collection Asset

When an element needs URLs to create a list of hyperlinks to dynamically served Content Server pages, use the `RENDER.GETPAGEURL` tag.

These are the elements referred to in this example:

- `ElementCatalog/BurlingtonFinancial/Page/SectionFront`
- `ElementCatalog/BurlingtonFinancial/Collection/PlainList`

For the purposes of this example, the code displayed is stripped of any error checking so that you can focus on how the links are created.

### First element: SectionFront

SectionFront is the template element, the root element, of the SectionFront template which is assigned to the main section pages—News, Markets, Stocks, and so on. It is invoked when a visitor clicks a link to a section.

One section of a page formatted with the SectionFront element displays a list of links to articles from the Section Highlights collection that is associated with that page asset.



#### Genome Project Director Tells Congress to Act

Dr. Francis Collins, director of the National Human Genome Research Institute, appeared before Congress to urge legislation protecting individual's genetic privacy.

#### Confederate Submarine to Be Lifted from Ocean

The Confederate Submarine Hunley was the first submarine to sink an enemy warship. It will be raised 136 years after it sank.

#### Demonstrators Stage Protests Against U.S. Sanctions, Bombings in Iraq

Some 300 protesters from a loose coalition of human rights organizations and interest groups staged the demonstration to mark the 10th anniversary of U.S. economic sanctions on Iraq following the Gulf War.

#### 100 Blank Passports Still Missing in D.C.

Friday afternoon, a box of passports fell out of a truck transporting the load from the Government Printing Office to the U.S. passport office.

#### California Faces Power Blackout Threat

Rising temperatures once again pushed California's power grid to the brink of a full-scale power emergency. Producers in neighboring states are on standby in case of rolling blackouts.

Use Content Server Explorer to open and examine the `SectionFront` element:

`ElementCatalog/BurlingtonFinancial/Page/SectionFront.`

First, `SectionFront` uses the variables `c` and `cid` to load and scatter the page asset, and names it “`SectionFrontPage`”:

```
<satellite.tag type="open"/>
<ASSET.LOAD TYPE="Variables.c" OBJECTID="Variables.cid"
NAME="SectionFrontPage"/>
<ASSET.SCATTER NAME="SectionFrontPage" PREFIX="asset"/>
```

The values for `c` and `cid` are passed to the `SectionFront` element from the link that invoked it. That link could be from the home page or any one of several other locations.

### Note

The `<satellite.tag type="open"/>` statement begins this element because it uses `RENDER.SATELLITEPAGE` and `RENDER.SATELLITEBLOB` tags. When you use CS-Satellite tags or the CS-Direct equivalents of those tags in an element, you start the element with a `<satellite.tag type="open"/>` statement and end the element with a `<satellite.tag type="close"/>` statement. For more information about CS-Satellite tags see the *CSEE Developer's Tag Reference*.

In Content Server Explorer, scroll down past several `ASSET.CHILDREN` tags to the one that retrieves the Section Highlights collection:

```
<ASSET.CHILDREN NAME="SectionFrontPage"
LIST="SectionHighlights" CODE="SectionHighlight"/>
```

This code retrieves the collection with the `CODE="SectionHighlights"` statement and stores it as a list, also named `SectionHighlights`.

Then `SectionFront` calls the page entry of the `PlainList` template (a collection template):

```
<RENDER.SATELLITEPAGE
pagename="BurlingtonFinancial/Collection/PlainList"
ARGS_cid="SectionHighlights.oid" ARGS_p="Variables.asset:id"/>
```

This code passes in the ID of the Section Highlights collection (`cid`) and the ID of the current page asset (`p`), which is the page asset assigned the name of `SectionFrontPage`.

## Second element: PlainList

The `PlainList` page entry invokes its root element, the template element for the `PlainList` template. Use Content Server Explorer to open and examine it:

`ElementCatalog/BurlingtonFinancial/Collection/PlainList.`

`PlainList` extracts the articles from the collection and presents them in a list, by their rank, with the subheadline of the article. This element assumes that the assets in the collection are articles.

`PlainList` uses the values in `c` and `cid` (passed in from the `SectionFront` element) to load and scatter the collection:

```
<ASSET.LOAD TYPE="Variables.c" OBJECTID="Variables.cid"
NAME="PlainListCollection"/>
<ASSET.SCATTER NAME="PlainListCollection" PREFIX="asset"/>
```

PlainList then sets the variable `ct` to `Full` because a value for this variable was not passed in (`Full` is the name of an article template):

```
<IF COND="IsVariable.ct!=true">
  <THEN>
    <SETVAR NAME="ct" VALUE="Full" />
  </THEN>
</IF>
```

Next PlainList creates a list of all the child articles in the collection asset, listing them by their rank, and naming the list “theArticles”.

```
<ASSET.CHILDREN NAME="PlainListCollection" LIST="theArticles"
  OBJECTTYPE="Article" ORDER="nrnk" CODE="-" />
```

Note that this `ASSET.CHILDREN` tag used the `OBJECTTYPE` parameter. If you use the `OBJECTTYPE` parameter with this tag, the resulting list of children is a join of the `AssetRelationTree` and the asset table for the type you specified—in this case, the `Article` table—and it contains data from both tables.

There is now no need for subsequent `ASSET.LOAD` tags because the data that the PlainList element is going to use to create the links to these articles is stored in the `Article` table.

PlainList loops through the list of articles, using the `RENDER.GETPAGEURL` tag to create a URL for each one. In this case —because the code does not use subsequent `ASSET.LOAD` tags for each of the children assets— the element includes a `RENDER.LOGDEP` tag in the loop:

```
<LOOP LIST="theArticles">
  <RENDER.LOGDEP cid="theArticles.id" c="Article" />
  <RENDER.GETPAGEURL PAGENAME="BurlingtonFinancial/Article/
    Variables.ct"
    cid="theArticles.id"
    c="Article"
    p="Variables.p"
    OUTSTR="referURL" />
```

PlainList passes a `cid` and `pagename` and the asset type with `ctype` for each article in the collection to the `RENDER.GETPAGEURL` tag. Because the variable `ct` was set to `Full`, the page name being passed to the tag is actually `BurlingtonFinancial/Article/Full`.

The `RENDER.GETPAGEURL` tag returns a `referURL` variable for each article in the collection, as specified by the `OUTSTR` parameter, and then PlainList uses the value in the `referURL` variable to create an HTML `<A HREF>` link for each article.

Because the `ASSET.CHILDREN` tag that obtained this collection created a join between `AssetRelationTree` and the `Article` table, PlainList can use the article’s subheadline field to create the link:

```
<A class="wirelink" HREF="Variables.referURL"
  REPLACEALL="Variables.referURL">
  <csvar NAME="Variables.theArticles:subheadline" />
</A>
</LOOP>
```

Note the use of the `REPLACEALL` tag as an attribute for this HTML tag. You must use this tag as an HTML attribute when you want to use XML variables in an HTML tags. (For more information about `REPLACEALL`, see the *CSEE Developer's Tag Reference*.)

## Example 3: Using the `ct` Variable

The `ct` variable represents the concept of a “child template.” Child templates are alternate templates. Because assets are assigned a template when they are created, the identity of an asset’s template (which is not the same as a default approval template) is part of the information you obtain with an `ASSET.LOAD` or an `ASSET.CHILDREN` tag.

However, sometimes you want to use a template other than an asset’s default template. In such a case, you supply the name of an alternate template with the `ct` variable.

For example, when a visitor browses the Burlington Financial site, there are text-only versions of most of the site available to that visitor. The text-only format is not the default format and content providers do not assign text-only formats to their assets. The Burlington Financial page elements are coded to provide the ID of the alternate, text-only template when it is appropriate to do so.

Open the Content Server interface, and preview both the Burlington Financial Columnists page and the News Page. In the upper right corner of these pages, the Plain Text link is displayed.

 [Plain Text](#)

Click the Plain Text link on the Columnists page. Then click the Plain Text link on the News Page:

### **BurlingtonFinancial.com - Burlington Financial News**

Web Format: [Burlington Financial Homepage](#)

Plain Text Links: [Home](#) | [News](#) | [Companies](#) | [Portfolio](#) | [Markets](#) | [Stocks](#) | [About](#)

News

▸ [World News](#)

[\[Web Format News\]](#)

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#### Top Stories for News

##### **Genome Project Director Tells Congress to Act**

Dr. Francis Collins, director of the National Human Genome Research Institute, appeared before Congress to urge legislation protecting individual's genetic privacy.

Every page on the site uses the same element, the `TextOnlyLink` element, to determine the URL embedded in the Plain Text link for that page. The `TextOnlyLink` element returns the correct URL for each page because the Plain Text link on each page passes the `TextOnly` element the information that it needs:

- The ID of the page making the request

- The alternate, text-only template (that is, the child template) to use for the Plain Text link

These are the elements used in this example:

- ElementCatalog/BurlingtonFinancial/Page/SectionFront
- ElementCatalog/BurlingtonFinancial/Page/SectionFrontText
- ElementCatalog/BurlingtonFinancial/Common/TextOnlyLink
- ElementCatalog/BurlingtonFinancial/Page/ColumnistFront

## First Element: SectionFront

Use Content Server Explorer to open and examine the Section Front element:

ElementCatalog/BurlingtonFinancial/Page/SectionFront.

SectionFront is the template element (root element) of the template asset assigned to the standard section pages on the site, pages such as News, Money, Stocks, and so on.

Scroll down approximately two-thirds of the element to this CALLELEMENT tag:

```
<CALLELEMENT NAME="BurlingtonFinancial/Common/TextOnlyLink">
  <ARGUMENT NAME="ct" VALUE="SectionFrontText" />
  <ARGUMENT NAME="assettype" VALUE="Page" />
</CALLELEMENT>
```

TextOnlyLink is the element that creates the Plain Text Link. SectionFront passes it the name of the alternate template (ct="SectionFrontText") and the name of the asset type (assettype="Page").

## Second Element: TextOnlyLink

The TextOnlyLink element executes. Use Content Server Explorer to open and examine it:

ElementCatalog/BurlingtonFinancial/Common/TextOnlyLink

First, TextOnlyLink checks to see whether there is a value for ct.

```
<IF COND="IsVariable.ct!=true">
  <THEN>
    <SETVAR NAME="ct" VALUE="Variables.asset:templateText" />
  </THEN>
</IF>
```

There is a value for ct because the SectionFront element passed in ct="SectionFrontText".

Next, TextOnlyLink uses a RENDER.GETPAGEURL tag to obtain a URL for the Plain Text link, passing in the page name by concatenating one based on the variables that were passed to TextOnlyLink by SectionFront.

```
<RENDER.GETPAGEURL PAGENAME="BurlingtonFinancial/
Variables.assettype/Variables.ct"
  cid="Variables.asset:id"
  c="Variables.assettype"
  p="Variables.p"
  OUTSTR="referURL" />
```

TextOnlyLink knows that `ct="SectionFrontText"` and that `assettype="Page"`. Therefore `BurlingtonFinancial/Variables.assettype/Variables.ct` means `BurlingtonFinancial/Page/SectionFrontText`.

Now that TextOnlyLink has a URL (in the `referURL` variable specified by the `OUTSTR` parameter), it can create the Plain Text link with an HTML `<A HREF>` tag:

```
<A class="contentlink" HREF="Variables.referURL"
  REPLACEALL="Variables.referURL">
  Plain Text</A><BR/>
```

Note the use of the `REPLACEALL` tag as an attribute for this HTML tag. You must use this tag as an HTML attribute when you want to use XML variables in an HTML tag. (For more information about `REPLACEALL`, see the *CSEE Developer's Tag Reference*.)

And then TextOnlyLink clears the `ct` variable.

```
<REMOVEVAR NAME="ct" />
```

When a visitor clicks the Plain Text link, the article is formatted with the `SectionFrontText` element and then displayed in the browser.

### Note

If you are interested in the format of the plain text version of a section page, use Content Server Explorer to open and examine `SectionFrontText`:

```
ElementCatalog/BurlingtonFinancial/Page/
SectionFrontText
```

## ColumnistFront

Use Content Server Explorer to open and examine the `ColumnistFront` element:

```
ElementCatalog/BurlingtonFinancial/Page/ColumnistFront
```

This element formats the web format page that displays the stories supplied from the Burlington Financial columnists.

To create the Plain Text link in the upper right corner of a section page, `ColumnistFront` calls TextOnlyLink:

```
<CALLELEMENT NAME="BurlingtonFinancial/Common/TextOnlyLink">
  <ARGUMENT NAME="ct" VALUE="ColumnistFrontText" />
  <ARGUMENT NAME="assettype" VALUE="Page" />
</CALLELEMENT>
```

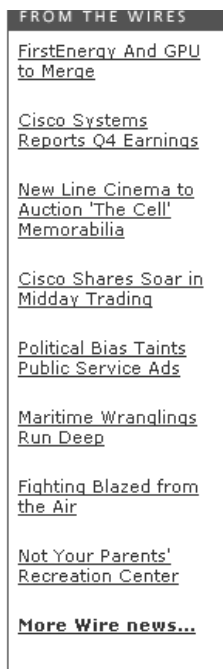
Based on the information passed in from `ColumnistFront`, this time TextOnlyLink creates a Plain Text link that takes the visitor to `BurlingtonFinancial/Page/ColumnistFrontText`.



## Example 4: Coding Templates for Query Assets

When you use a query asset to obtain the assets that you want to display, you use the standard CS-Direct element name `ExecuteQuery` to run it.

Burlington Financial uses several query assets. This example describes a query asset named Home Wire Feed which is used to list wire feed stories on the Home page:



These are the elements used in this example:

- ElementCatalog/BurlingtonFinancial/Page/Home
- ElementCatalog/BurlingtonFinancial/Query/WireFeedBox
- ElementCatalog/OpenMarket/Xcelerate/AssetType/Query/ExecuteQuery

### First Element: Home

Use Content Server Explorer to open and examine the template element for the Home page:

ElementCatalog/BurlingtonFinancial/Page/Home

First, Home loads the home page asset, names it `HomePage`, and then scatters the information in its fields:

```
<ASSET.LOAD TYPE="Variables.c" OBJECTID="Variables.cid"
NAME="HomePage" />
<ASSET.SCATTER NAME="HomePage" PREFIX="asset" />
```

The values for `c` and `cid` are passed in from the Burlington Financial URL.

Scroll down past several `CALLELEMENT` and `RENDER.SATELLITEPAGE` tags to the following `ASSET.CHILDREN` tag:

```
<ASSET.CHILDREN NAME="HomePage" LIST="WireFeedStories"
```

```
CODE="WireFeed"/>
```

Notice that in this line of code, the OBJECTTYPE parameter is not used. CODE="WireFeed" is enough information for Content Server Direct to locate and retrieve the query assigned to the Home page asset through the WireFeed association and there is no need to create a join between the AssetRelationTree and the Query table because all that Home needs is the ID of the query. The WireFeed query is retrieved and stored as "WireFeedStories".

Next, Home calls the page entry of the WireFeedBox template, passing it the cid of the query stored as "WireFeedStories":

```
<RENDER.SATELLITEPAGE PAGENAME="BurlingtonFinancial/Query/WireFeedBox"
ARGS_cid="WireFeedStories.oid"
ARGS_p="Variables.asset:id"/>
```

Home passes on several pieces of information: the identity of the query with the cid="WireFeedStories.oid" statement and the identity of the originating page asset, Home, with the p="Variables.asset:id" statement.

## Second Element: WireFeedBox

The WireFeedBox page entry invokes its root element, the template element for the WireFeedBox template. Use Content Server Explorer to open and examine it:

```
ElementCatalog/BurlingtonFinancial/Query/WireFeedBox
```

This element invokes the ExecuteQuery element to run the query and then displays a list of links to the article assets returned by the query.

First, WireFeedBox loads the query asset passed in from Home, names it "WireFeedBoxQuery", and then retrieves the values from all of its fields with an ASSET.SCATTER statement:

```
<ASSET.LOAD TYPE="Variables.c" OBJECTID="Variables.cid"
NAME="WireFeedBoxQuery"/>
<ASSET.SCATTER NAME="WireFeedBox" PREFIX="asset"/>
```

Variables.cid is the WireFeedStories.oid passed in from the Home element.

Then WireFeedBox calls the ExecuteQuery element:

```
<CALLELEMENT NAME="OpenMarket/Xcelerate/AssetType/Query/
ExecuteQuery">
<ARGUMENT NAME="list" VALUE="ArticlesFromWireQuery"/>
<ARGUMENT NAME="assetname" VALUE="WireFeedBoxQuery"/>
<ARGUMENT NAME="ResultLimit" VALUE="8"/>
</CALLELEMENT>
```

WireFeedBox passed in the query asset, the name of the list to create to hold the results of the query, and a limit of 8 so that no matter how many assets the query returns to ExecuteQuery, ExecuteQuery returns only 8 of them to WireFeedBox.

## Third Element: ExecuteQuery

The `ExecuteQuery` element runs the query asset.

The query assets that can be assigned to a page asset as that page's "Wire Feed" query are coded to return field data rather than the IDs of assets only. Therefore, `ExecuteQuery` returns up to eight article assets and the data from several of their fields to `WireFeedBox`.

Use Content Server Explorer to open and examine `ElementCatalog/OpenMarket/Xcelerate/AssetType/Query/ExecuteQuery` if you are interested in this element. Notice that the first line of code in the element is `RENDER.UNKNOWNDEPS` because there is no way of knowing which assets will be returned so there is no way to log dependencies for them.

When `ExecuteQuery` is finished, `WireFeedBox` resumes.

## Back to WireFeedBox

`WireFeedBox` resumes, looping through the list of articles returned by `ExecuteQuery`, and obtaining a URL for each one by using a `RENDER.GETPAGEURL` tag.

Because there is no way of knowing which article assets will be returned by `ExecuteQuery`, there is a `RENDER.FILTER` tag included in the loop to filter out unapproved assets when the publishing method is Export to Disk:

```
<RENDER.FILTER LIST="ArticlesFromWireQuery"
LISTVARNAME="ArticlesFromWireQuery" LISTIDCOL="id"/>
  <if COND="ArticlesFromWireQuery.#numRows!=0">
    <then>
      <LOOP LIST="ArticlesFromWireQuery">
        <RENDER.GETPAGEURL PAGENAME="BurlingtonFinancial/Article/
WireStory"
cid="ArticlesFromWireQuery.id"
c="Article"
p="Variables.p"
OUTSTR="referURL"/>
        <A class="wirelink" HREF="Variables.referURL"
REPLACEALL="Variables.referURL"><csvar
NAME="ArticlesFromWireQuery.subheadline"/></A><P/>
          </LOOP>
        </then>
      </if>
```

The `RENDER.GETPAGEURL` tag returns a URL for each article in the list in a variable named `referURL`. `WireFeedBox` uses the value from the `referURL` variable to create links to the articles, using the content from their subheadline fields (which is one of the fields that the Wire Feed query returned) as the hyperlinked text.

Note the use of the `REPLACEALL` tag as an attribute for this HTML tag. You must use this tag as an HTML attribute when you want to use XML variables in an HTML tag. (For more information about `REPLACEALL`, see the *CSEE Developer's Tag Reference*.)

## Example 5: Displaying an Article Asset Without a Template

Burlington Financial provides an “email this article to a friend” function. Here is the email form for an article:

### Genome Project Director Tells Congress to Act

Dr. Francis Collins, director of the National Human Genome Research Institute, appeared before Congress to urge legislation protecting individual's genetic privacy.

---

#### E-mail this article to a friend

To e-mail this article to a friend, enter your e-mail address and the recipient's e-mail address in the fields below. (\*=required field)

---

\* Your name:

\* Your e-mail address:

\* Recipient's e-mail address:   
(use a comma and a space to separate multiple recipients)

Subject:

Message:   
(optional)

---

---

Obviously the Burlington Financial developers do not want the Burlington Financial content providers to assign the email form to an article as the article's Display Style (template). Therefore, there is no template asset that points to the email element that creates the article email form.

These are the elements used in this example:

- ElementCatalog/BurlingtonFinancial/Article/Full
- ElementCatalog/BurlingtonFinancial/Article/AltVersionBlock
- ElementCatalog/BurlingtonFinancial/Util/EmailFront

### First Element: Full

Use Content Server Explorer to open and examine the template element for the Full template:

ElementCatalog/BurlingtonFinancial/Article/Full

This element provides the formatting code for articles when they are displayed in full. It displays the following items:

- A site banner
- The left navigation column
- A collection of related stories
- The text of the article
- A photo for the article

- A link that prints the story
- A link that emails the story

Scroll down past several `RENDER.SATELLITEPAGE` and `CALLELEMENT` tags to the following tag:

```
<CALLELEMENT NAME="BurlingtonFinancial/Article/
AltVersionBlock"/>
```

## Second Element: AltVersionBlock

Use Content Server Explorer to open and examine this element:

ElementCatalog/BurlingtonFinancial/Article/AltVersionBlock

`AltVersionBlock` is a short element with two `RENDER.GETPAGEURL` tags. The first `RENDER.GETPAGEURL` tag obtains the URL for the print version of an article. The second `RENDER.GETPAGEURL` tag obtains the URL for the email version of the story.

Because the Burlington Financial developers want a dynamic URL for the email version of the story even if the site is a static site, the second `RENDER.GETPAGEURL` tag uses the `DYNAMIC` parameter.

Scroll down to the second `RENDER.GETPAGEURL` tag:

```
<RENDER.GETPAGEURL PAGENAME="BurlingtonFinancial/Util/
EmailFront "
cid="Variables.asset:id"
c="Article"
DYNAMIC="true"
OUTSTR="referURL"/>
```

`AltVersionBlock` passes in the pagename for the `EmailFront` page entry, and a value for `c`, and `cid`, and sets the `DYNAMIC` parameter to `"true"`. The tag creates a dynamic URL for the article (even if the publishing method is Export to Disk) and returns it in a variable named `referURL`, as specified by the `OUTSTR` parameter.

## Third Element: EmailFront

`EmailFront` is the pagename that `AltVersionBlock` passes to the `RENDER.GETPAGEURL` element. Because there is no corresponding template for `EmailFront`, CS-Direct did not create a page entry in the `SiteCatalog` for `EmailFront` by default. The Burlington Financial developers created the `SiteCatalog` entry for this element manually through Content Server Explorer.

Use Content Server Explorer to open and examine its root element:

ElementCatalog/BurlingtonFinancial/Util/EmailFront

This element creates a form that displays the first paragraph of the article that the visitor has chosen to email.

First, `EmailFront` loads the article asset:

```
<ASSET.LOAD TYPE="Article" OBJECTID="Variables.cid"
NAME="EmailFront"/>
<ASSET.SCATTER NAME="EmailFront" PREFIX="asset"/>
```

Then it formats several parts of the page before creating the email form. Scroll down to the `HTML FORM` tag:

```
<FORM NAME="mailform" onSubmit="return checkEmail();"
METHOD="POST" ACTION=...
```

EmailFront then calls the `LeadSummary` page entry to display a summary of the article in the form:

```
<RENDER.SATELLITEPAGE
ARGS_pagename="BurlingtonFinancial/Article/LeadSummary"
ARGS_cid="Variables.cid"
ARGS_ct="Full"
ARGS_p="Variables.p"/>
```

For information about the `LeadSummary` element, see “Example 1: Basic Modular Design” on page 510 or use Content Server Explorer to open and examine it.

## Example 6: Displaying Site Plan Information

Because the developers of the Burlington Financial sample site used the Site Plan tab in the Content Server interface to order the basic structure of the Burlington Financial site, they are able to extract information from the `SitePlanTree` table to create navigational features for the site.

For example, the navigation bar at the top of the Burlington Financial home page is created by extracting information about the site's structure from the `SitePlanTree` table.

**Home | News | Funds | Companies | Portfolio | Markets | Stocks | About**

To extract information from the `SitePlanTree` table, you use the CS-Direct `SITEPLAN` tag family.

These are the elements used in this example:

- `ElementCatalog/BurlingtonFinancial/Article/Home`
- `ElementCatalog/Pagelet/Common/SiteBanner`
- `ElementCatalog/BurlingtonFinancial/Site/TopSiteBar`

### First Element: Home

Use Content Server Explorer to open and examine the template element for the Home template:

`ElementCatalog/BurlingtonFinancial/Page/Home`

Scroll down to the first `RENDER.SATELLITEPAGE` tag:

```
<RENDER.SATELLITEPAGE PAGENAME="BurlingtonFinancial/Pagelet/
Common/SiteBanner"/>
```

### Second Element: SiteBanner

The `SiteBanner` pagelet invokes its rootelement. Use Content Server Explorer to open and examine it:

`ElementCatalog/BurlingtonFinancial/Common/SiteBanner`

SiteBanner gathers the images for the banner (the Burlington Financial logo and an advertising image) and then calls an element that creates the navigational links to the main sections of the site.

Scroll down to this CALLELEMENT tag:

```
<CALLELEMENT NAME="BurlingtonFinancial/Site/TopSiteBar"/>
```

### Third Element: TopSiteBar

TopSiteBar executes, creating the navigational links to the main sections in the site. Use Content Server Explorer to open and examine TopSiteBar:

ElementCatalog/BurlingtonFinancial/Site/TopSiteBar

### Creating the Link for the Home Page

First, TopSiteBar loads the Home page, names it “target”, gets the value from its ID field, and stores that value in the output variable “pageid”:

```
<ASSET.LOAD TYPE="Page" NAME="target" FIELD="name" VALUE="Home "
DEPTYPE="exists"/>
<ASSET.GET NAME="target" FIELD="id" OUTPUT="pageid"/>
```

Note that the ASSET.LOAD tag changes the dependency type from its default of exact to exists with the DEPTYPE parameter. For a link like this one, a link in a navigational bar, it makes more sense for the dependency to be an exists dependency.

Then TopSiteBar uses the variable pageid to obtain a URL for the Home page from a RENDER.GETPAGEURL tag:

```
<RENDER.GETPAGEURL PAGENAME="BurlingtonFinancial/Page/Home "
cid="Variables.pageid"
c="Page "
OUTSTR="referURL"/>
```

Next TopSiteBar extracts the page asset’s name from its **Name** field and uses it as the text for the hyperlink:

```
<ASSET.GET NAME="target" FIELD="name" OUTPUT="thepagename"/>
<A class="sectionlinks" HREF="Variables.referURL"
REPLACEALL="Variables.referURL"><csvar
NAME="Variables.thepagename"/></A>
```

Note the use of the REPLACEALL tag as an attribute for this HTML tag. You must use this tag as an HTML attribute when you want to use XML variables in an HTML tag. (For more information about REPLACEALL, see “Using Variables in HTML Tags” on page 88.)

### Creating the Links to the Home Page’s Child Pages

In the next part of the code, TopSiteBar creates links for the child pages of the Home page. In order to determine the child pages of the Home page, it must first determine the node ID of the Home page.

The node ID of a page asset is different from its object ID:

- You use an object ID to extract information about an asset from asset tables.
- You use a node ID to extract information about a page asset from the SitePlanTree table.

First, TopSiteBar determines the node ID of the Home page:

```
<ASSET.GETSITENODE NAME="target" OUTPUT="PageNodeId"/>
```

Then it uses that information to load the Home page as a siteplan node object:

```
<SITEPLAN.LOAD NAME="ParentNode" NODEID="Variables.PageNodeId"/>
```

With the Home page node identified and loaded, TopSiteBar can then obtain the Home page's child nodes, storing them in a list that it names "PeerPages," and ordering them according to their rank:

```
<SITEPLAN.CHILDREN NAME="ParentNode" TYPE="PAGE" LIST="PeerPages"
CODE="Placed" ORDER="nrank"/>
```

And now TopSiteBar loops through all the child nodes at the first level, using the RENDER.GETPAGEURL tag to create a URL for the link to each page:

```
<IF COND="IsList.PeerPages=true">
<THEN>
  <LOOP LIST="PeerPages">&nbsp;|&nbsp;
    <ASSET.LOAD NAME="ThePage" TYPE="Page"
      OBJECTID="PeerPages.oid"/>
    <ASSET.GET NAME="ThePage" FIELD="name"
      OUTPUT="thepagename"/>
    <ASSET.GET NAME="ThePage" FIELD="template"
      OUTPUT="pagetemplate"/>
    <RENDER.GETPAGEURL PAGENAME="BurlingtonFinancial/Page/
      Variables.pagetemplate"
      cid="PeerPages.oid"
      c="Page"
      OUTSTR="referURL"/>
    <A class="sectionlinks" HREF="Variables.referURL"
      REPLACEALL="Variables.referURL">
    <csvar NAME="Variables.thepagename"/>
  </A>
```

Notice how the page name is constructed in this example. The second ASSET.GET statement in the preceding piece of code obtains the name of the page's template from its template field. Here it is again:

```
<ASSET.GET NAME="ThePage" FIELD="template"
OUTPUT="pagetemplate"/>
```

Then, that information is used in the PAGENAME parameter passed to the RENDER.GETPAGEURL tag:

```
PAGENAME="BurlingtonFinancial/Page/Variables.pagetemplate"/>
```

Therefore, if the template for the page asset is SectionFront, this argument statement passes pagename="BurlingtonFinancial/Page/SectionFront. And if the template for the page asset is AboutUs, this argument statement passes pagename="BurlingtonFinancial/Page/AboutUs.



## Back to SiteBanner

SiteBanner is finished after the call to TopSiteBar. The SiteBanner element is invoked on each page in the site.

Because SiteBanner has a page entry in the SiteCatalog table, the results of the navigational bar that TopSiteBar creates is cached the first time a visitor requests a page on the Burlington Financial site. This speeds up performance because the site does not have to re-invoke the TopSiteBar element for each and every page that the visitor subsequently visits.

## Example 7: Displaying Non-Asset Information

Sometimes you need to render and display information that is not stored as an asset in the Content Server database. For example, the Burlington Financial site displays today's date on each page. The date is not information that can be stored as an asset.

These are the elements used in this example:

- ElementCatalog/BurlingtonFinancial/Article/Home
- ElementCatalog/Common/ShowMainDate

### First Element: Home

Use Content Server Explorer to open and examine the template element for the Home template:

ElementCatalog/BurlingtonFinancial/Page/Home

Scroll down to the third CALLELEMENT tag, one that invokes the ShowMainDate element.

```
<CALLELEMENT NAME="BurlingtonFinancial/Common/ShowMainDate"/>
```

### Second Element: ShowMainDate

ShowMainDate executes. Use Content Server Explorer to open and examine it:

ElementCatalog/BurlingtonFinancial/Common/ShowMainDate

The main line of code is this one:

```
<span class="dateline"><csvar NAME="CS.Day CS.Mon CS.DDate,
CS.Year"/></span>
```

It calculates the date and then returns that value to the Home element, which displays it at the top of the page, under the navigation bar and over the main list of stories.

This element performs a simple calculation and then outputs the value into the HTML code that is rendered in the browser window. There are no content assets that it formats or template assets that use it as a root element. It also has no SiteCatalog entry because its result—the date—should be calculated each time the Home page is rendered.



## Chapter 23

# User Management on the Delivery System

Content Server provides authentication functionality through the `USER` tags, user profile management through the `DIR` tags, and enforces security on database tables and rendered pages through access control lists (ACLs). You use these user management and security mechanisms to manage users and control visitor access on your distribution system and on your CSEE development and management systems.

This chapter contains the following sections:

- The Directory Services API
- Controlling Visitor Access to Your Online Sites
- Creating Login Forms
- Creating User Account Creation Forms
- Visitor Access in the Burlington Financial Sample Site
- Visitor Management and Commerce Connector

## The Directory Services API

The Directory Services API enables your CSEE system to connect to directory servers that contain authentication information, user information, and so on.

Content Server delivers three directory services plug-ins, one of which was installed when your CSEE systems were installed:

- The Content Server directory services plug-in, which uses the native Content Server user management tables; that is, the `SystemUsers` and `SystemUserAttrs` tables
- The LDAP plug-in, which actually supports any JNDI server
- The NT plug-in, which retrieves user credentials and login name from the NT directory but gets all other user information from the `SystemUserAttrs` table

The plug-in is installed during the installation of your CSEE systems and it is configured by setting properties in the `dir.ini` file. For information about configuring your user management setup, see the *CSEE Administrator's Guide*.

## Entries

A directory entry is a named object with assigned attributes, in particular, user and group type entries:

- A user type object has a distinguished name and a set of attributes such as `commonname`, `username`, `password` and `email`.
- A group type object, similar to a Content Server ACL, also has a distinguished name and a set of attributes.

Names reflect the hierarchy in which they are associated; to ensure portability across directory implementations, names should be treated as opaque strings.

## Hierarchies

Some directory databases organize entries using a hierarchical structure. With CSEE's directory services API, an entry's attributes and its place in the hierarchy are distinct. As a result, retrieving an entry's attributes does not yield information about its children.

Support for hierarchies depends on the underlying directory implementation; for example, LDAP directories support a hierarchical structure, while Content Server's native directory database does not support a hierarchical structure.

To ensure portability across directory implementations, your code should not assume support for hierarchical data.

Group hierarchies do not affect internal Content Server permissions.

## Groups

CSEE's directory services API does not enforce referential integrity. When you delete a user with the directory tags, your application must ensure that group memberships are also deleted, by first removing the user from the groups that he is associated with.

When a member is added to a group, the JNDI implementation always builds a fully distinguished name for the value of the `uniquemember` attribute, regardless of the name passed into the `addmember` tag.

## Directory Services Tags

Content Server delivers the `DIR` tag family, with both XML and JSP versions, that you can use to invoke the Directory Services API.

The `DIR` tags are as follows:

Tag	Description
<code>DIR.ADDATTRS</code> <code>dir:addattrs</code>	Adds attributes to an existing entry (which can be either a user or a group).
<code>DIR.ADDGROUPMEMBER</code> <code>dir:addgroupmember</code>	Adds a member to a group (usually a user).

Tag	Description
DIR.CHILDREN dir:children	Retrieves the child entries for a specified parent in a list variable.
DIR.CREATE dir:create	Creates a directory entry.
DIR.DELETE dir:delete	Deletes a directory entry.
DIR.GETATTRS dir:getattrs	Gets the attribute values for a specified entry in a list variable.
DIR.GROUPMEMBERS dir:groupmembers	Lists the members of a specified group.
DIR.GROUPMEMBERSHIPS dir:groupmemberships	Lists all the groups that an entry (either a group or a user) belongs to.
DIR.LISTUSERS dir:listusers	Returns a list of all the users in the directory.
DIR.REMOVEATTRS dir:removeattrs	Deletes an attribute value for an entry.
DIR.REMOVEGROUPMEMBER dir:removegroupmember	Removes an entry from a group.
DIR.REPLACEATTRS dir.replaceattrs	Replaces the value of an attribute for an entry (either a user or a group).
DIR.SEARCH dir:search	Searches the directory for entries who match the specified search criteria.

Regardless of whether the directory is implemented with LDAP, Content Server only, or any other directory server, the code you write with the DIR tags is very similar.

For more information about these tags, see the *CSEE Developer's Tag Reference*. For code samples, see “Directory Services Code Samples” on page 534.

## Directory Operations

Some of the CSEE Directory Services tags write information to the database. If your database administrators will be handling all of the web site's write operations, such as adding user information to the database, restrict use of the directory tags to read-only operations. This policy avoids synchronization issues with third-party directory administration tools.

The read-only operations are presented in this section. Operations are performed using the credentials and read permissions of the currently authenticated user.

## Searching

Due to limitations in some directory servers, search is not allowed from the top organizational level. To avoid portability issues, always specify the context attribute on the DIR.SEARCH tag.

## Lookup

Looking up a user generally involves two steps:

1. Call `DIR.SEARCH` on the `userid` to get the entry name.
2. Call `DIR.GETATTRS` to get the attributes of the user in question.

## Listing Users

FatWire recommends that you use one of the following three methods to list users:

- For small user databases, use the `DIR.LISTUSERS` tag, which recursively lists all users under the `peopleParent` property. This tag is inefficient on large user databases.
- For large user databases, use the `DIR.CHILDREN` tag to walk the hierarchy. The `DIR.CHILDREN` tag is best used for group types and not for user types.
- For user databases with a flat hierarchy, narrow results with a search

## Directory Services Code Samples

The following JSP code sample illustrates some possible directory operations:

```
<%
String sMainTestUserName = "ContentServer";
String sMainTestUserPW="FutureTense";

String sPeopleParent = ics.GetProperty("peopleparent", "dir.ini",
true);
String sGroupParent = ics.GetProperty("groupparent", "dir.ini",
true);
String sUsername = ics.GetProperty("username", "dir.ini", true);
String sCommonName = ics.GetProperty("cn", "dir.ini", true);
IList mylist;
%>

<user:su username='<%=sMainTestUserName%>'
password='<%=sMainTestUserPW%>'>

<H2>List All Users</H2>

<ics:clearerrno/>
<dir:listusers list='mylist' />
<br>
<b>dir:listusers errno: <ics:getvar name='errno' /></b>
<ics:listloop listname='mylist'>
    <br><ics:listget listname='mylist' fieldname='NAME' />
</ics:listloop>

<H2>Look Up the ContentServer User by Username</H2>

<ics:clearerrno/>
<dir:search list='mylist' context='<%=sPeopleParent%>'>
    <dir:argument name='<%=sUsername%>' value='ContentServer' />
</dir:search>
```

```

<br><b>dir:search errno: <ics:getvar name='errno' /></b>

<%
    mylist = ics.GetList("mylist");
    if(mylist.numRows() != 1) {
        out.print("<br>Error finding entry.");
    }
    mylist.moveTo(1);
    ics.SetVar("ContentServerDn", mylist.getValue("NAME"));
%>

<H2>Show ContentServer Attributes</H2>

<ics:clearerrno/>
<dir:getattrs list='mylist'
    name='<%=ics.GetVar("ContentServerDn")%>' />
<br><b>dir:getattrs errno: <ics:getvar name='errno' /></b>
<ics:listloop listname='mylist'>
    <br>
    <ics:listget listname='mylist' fieldname='NAME' />=
    <ics:listget listname='mylist' fieldname='VALUE' />
</ics:listloop>

<H2>Show Group Memberships for ContentServer</H2>

<ics:clearerrno/>
<dir:groupmemberships name='<%=ics.GetVar("ContentServerDn")%>'
    list='mylist' />
<br><b>dir:groupmemberships errno: <ics:getvar name='errno' /></b>
<ics:listloop listname='mylist'>
<br>
    <ics:listget listname='mylist' fieldname='NAME' />
</ics:listloop>

<H2>Lookup the SiteGod Group by CommonName</H2>

<ics:clearerrno/>
<dir:search list='mylist' context='<%=sGroupParent%>'>
    <dir:argument name='<%=sCommonName%>' value='SiteGod' />
</dir:search>
<br><b>dir:search errno: <ics:getvar name='errno' /></b>

<%
    mylist = ics.GetList("mylist");
    if(mylist.numRows() != 1) {
        out.print("<br>Error finding entry.");
    }
    mylist.moveTo(1);
    ics.SetVar("SiteGodDn", mylist.getValue("NAME"));
%>

<H2>Show SiteGod Attributes</H2>

```

```

<ics:clearerrno/>
<dir:getattrs list='mylist' name='<%=ics.GetVar("SiteGodDn")%>' />
<br>
<b>dir:getattrs errno: <ics:getvar name='errno' /></b>
<ics:listloop listname='mylist'>
    <br>
    <ics:listget listname='mylist' fieldname='NAME' />=
    <ics:listget listname='mylist' fieldname='VALUE' />
</ics:listloop>

<H2>Show SiteGod Group Members</H2>

<ics:clearerrno/>
<dir:groupmembers name='<%=ics.GetVar("SiteGodDn")%>'
list='mylist2' />
<br>
<b>dir:groupmembers errno: <ics:getvar name='errno' /></b>
<ics:listloop listname='mylist2'>
    <br>
    <ics:listget listname='mylist2' fieldname='NAME' />
</ics:listloop>

<H2>Children of groupparent </H2>

<ics:clearerrno/>
<dir:children name='<%=sGroupParent%>' list='mylist' />
<br>
<b>dir:children errno: <ics:getvar name='errno' /></b>
<ics:listloop listname='mylist'>
    <br>
    <ics:listget listname='mylist' fieldname='NAME' />
</ics:listloop>

</user:su>

```

## Error Handling

Any of the directory tags can cause a range of directory errors to be set. See the *CSEE Developer's Tag Reference* for a comprehensive list of directory services error messages.

Your directory services code should handle every one of the error codes listed for a given tag call. This is necessary to support the J2EE JNDI interface.

## Troubleshooting Directory Services Applications

The first step in troubleshooting directory services applications is to check the error log (futuretense.txt).

You enable directory services logging by setting the `log.filterLevel` property (found in the `logging.ini` property file). There are seven levels of error messages that you can view:

- `fatal`, which logs fatal level messages



- severe, which logs severe and fatal level messages
- error, which logs error and fatal level messages
- warning, which logs warning and fatal level messages
- info, which logs warning, error, severe, and fatal level messages
- trace, which logs trace messages
- detail, which logs all types of messages

During troubleshooting, trace is the most verbose setting, and as a result, has the highest performance impact.

Directory services log entries use the following format:

```
[<timestamp>][Directory-<severity>-<errno>]
  [<class>:<method>][<message>][<session id>]
```

For example:

```
[Jan 17, 2002 1:49:44 PM][Directory-T]
  [BaseFactory:instantiateImplementation(ICS,String,Class[],
  Object[])] [Instantiating:com.openmarket.directory.common.Factor
  y]
  [PEccxyF1Ueh7zYvjNgg4D6bqZzf01lfWmaiBimIN9H1Z9KomDcPy]
```

The previous message is a trace (T), and thus has no associated errno value.

For information about error logging, see Chapter 7, “Error Logging and Debugging.”

A common problem for LDAP implementations is incorrectly specified permissions on the directory server. If the error log indicates a permission problem, ensure that the authenticated user has permissions to execute the requested operation by checking the permission settings on the directory server. For iPlanet, this entails checking the groups to which the user belongs, and checking the LDAP ACLs associated with those groups. Try logging into the directory server directly (outside of Content Server) and performing the same action to ensure that permissions are correctly set.

After checking the log and permissions, you can often resolve a configuration error by examining the property files.

For property descriptions and values, see the *CSEE Administrator's Guide*.

## Controlling Visitor Access to Your Online Sites

Content Server manages users through access control lists (ACLs). By using ACLs, you can restrict access to tables in the Content Server database and the rendered pages served on your sites by Content Server.

If you design an online site where visitors log in with user names and passwords, you can associate registered visitors with one or more ACLs.

When a visitor first visits a site, Content Server creates a session and implicitly logs in the visitor as the standard default user, **DefaultReader**. The identity of a visitor is updated (and any associated ACLs go into effect) when a `USER.LOGIN` command is used and the visitor is authenticated against a password.

## ACL Tags

Content Server provides a set of access control list tags (both XML and JSP versions) that you can use to create ACLs. You can use either the Content Server interface on the delivery system or the Content Server ACL tags to create the ACLs that you need for your visitor accounts on your delivery system.

The following table lists the ACL tags:

Tag	Description
ACL.CREATE acl:create	Creates an ACL
ACL.DELETE acl:delete	Deletes an ACL
ACL.GATHER acl:delete	Gathers fields into an ACL
ACL.GET acl:get	Copies a field from an ACL
ACL.LIST acl:list	Retrieves a list of ACLs
ACL.LOAD acl:load	Loads an ACL
ACL.SAVE acl:save	Saves an ACL
ACL.SCATTER acl:scatter	Scatters a field from an ACL
ACL.SET acl:set	Sets a field in an ACL

For more information:

- ACL tags—see the *CSEE Developer's Tag Reference*.
- ACLs in general—see the *CSEE Administrator's Guide*.

## User Tags

Content Server also provides the following USER tags (both XML and JSP versions) that you use on pages that log users in and out.

The USER tags are as follows:

Tag	Description
USER.LOGIN user:login	Logs a user in.
USER.LOGOUT user:logout	Logs a user out.

Tag	Description
USER.SU user:su	Logs the user in as a specific user in order to perform an operation such as creating an account or edit a user profile.

For more information about these tags, see the *CSEE Developer's Tag Reference*.

## Content Server and Encryption

Content Server includes a default key for encrypting passwords and other sensitive information. You can specify your own encryption key by using the `Utilities` class `encryptString` method. See the *CSEE Java API Reference* for information about Java methods that deal with encryption.

Content Server also supports Secure Sockets Layer (SSL), which allows encryption of information going to and from your web servers. For more information about Content Server and SSL, see the *CSEE Administrator's Guide*.

## Creating Login Forms

This section provides simple code samples that illustrate how to code login forms that prompt a visitor to log in and then authenticate the user name and password.

This example presents code from the following elements:

- `PromptForLogin`, an XML element that displays a form that requests a username and password
- `Login`, an XML element that authenticates the username and password combination passed to it from the `PromptForLogin` element

### Prompt for Login (PromptForLogin.xml)

The `PromptForLogin` element displays a form that asks a visitor to enter two pieces of information: username and password.

The code that creates the form follows:

```
<DIV ALIGN="center">
<FORM ACTION="ContentServer" METHOD="post">
<INPUT TYPE="hidden" NAME="pagename" VALUE="CSGuide/Security/
Login"/>

<TABLE CELLPADDING="5" CELLSPACING="5">

<TR>
<TH ALIGN="right">Name</TH>
<TD><INPUT TYPE="text" NAME="username" SIZE="16"/></TD>
</TR>

<TR>
<TH ALIGN="right">Password</TH>
```

```

<TD><INPUT TYPE="password" NAME="password" SIZE="16"/></TD>
</TR>

<TR>
<TD>&nbsp;</TD>
<TD ALIGN="center"><INPUT TYPE="submit" NAME="doit" VALUE="Login"/
></TD>
</TR>

</TABLE>

</FORM>
</DIV>

```

The visitor fills in the form and clicks the **Submit** button. The information gathered in the form and the page name of the Login page (see the first `input type` statement, above) is sent to the browser. The browser sends the page name to Content Server, Content Server looks it up in the SiteCatalog table and then invokes that page entry's root element.

## Root Element for the Login Page

There can only be one root element for a Content Server page (that is, an entry in the SiteCatalog table). The root element for the Login page is the Login.xml element.

The Login element attempts to log the visitor in and then to authenticate the visitor by using the USERISMEMBER tag to determine whether the visitor has any of the required ACLs.

This element does the following:

- Logs the visitor in with the USER.LOGIN tag and checks to see if there was an error.
- Sets a variable list that holds a list of ACLs to compare the visitor's credentials against.
- Checks the visitor's ACLs assignments against the list variable with the USERISMEMBER tag

The following sample code authenticates the visitor:

```

<SETVAR NAME="errno" VALUE="0"/>

<USER.LOGIN USERNAME="Variables.username"
PASSWORD="Variables.password"/>

<IF COND="Variables.errno=0">
  <THEN>
    <H3>Welcome <CSVAR NAME="Variables.username"/></H3>

<!-- Next, create a variable named "aclToCheck" and set it to hold
the ACLs that the visitor needs to progress any further on the
site. This variable can be set to one ACL or to a comma-separated
list of ACLs, as in this example-->

  <SETVAR NAME="aclToCheck" VALUE="ContentCustomer,SiteGod"/>
  <SETVAR NAME="errno" VALUE="0"/>

```

```

<USERISMEMBER GROUP="Variables.aclToCheck"/>
<IF COND="Variables.errno=1">
    <THEN>
        <P>You are a member of the at least one of the following
acIs:
        <CSVAR NAME="Variables.aclToCheck"/></P>
    </THEN>
    <ELSE>
        <P>Sorry, you are not a member of any of the following
acIs:
        <CSVAR NAME="Variables.aclToCheck"/></P>
    </ELSE>
</IF>

</THEN>
<ELSE>

    <H3>Sorry, can't find your credentials.</H3>

</ELSE>
</IF>

```

## Creating User Account Creation Forms

This section provides simple code samples that illustrate how to code forms that prompt a visitor to register (obtain a user account) and then create a user account for that visitor.

This example presents code from the following elements:

- `PromptForNew Account`, an XML element that displays a form that requests the visitor to enter the user name and password that he or she would like to use
- `CreateAccount`, a JSP element that creates the new account

### PromptForNewAccount

The `PromptForNewAccount` element displays a form that prompts the visitor to enter a user name and password and to re-enter the password to confirm it.

Here's the code that creates the form:

```

<div align="center">
<h3>Create a New Account</h3>
<FORM ACTION="ContentServer" METHOD="post">
<input type="hidden" name="pagename" value="CSGuide/Security/
CreateAccount"/>

<table cellpadding="5" cellspacing="5">

<tr>
<th align="right">Pick a username</th>
<td><input type="text" name="username" size="16"/></td>
</tr>

```

```
|  |  |
| --- | --- |
| Pick a password |  |
| Confirm your new password |  |
|  | |



</FORM>
</div>

```

The visitor fills in the form and clicks the **Submit** button. The information gathered in the form and the page name of the CreateAccount page (see the first `input type` statement, above) is sent to the browser.

The browser sends the page name to Content Server, Content Server looks it up in the SiteCatalog table and then invokes that page entry's root element.

## Root Element for the CreateAccount Page

There can only be one root element for a Content Server page (that is, an entry in the SiteCatalog table). The root element for the CreateAccount page is the CreateAccount.jsp element.

Only someone with SiteGod or ContentEditor ACLs can create a new user account. Because of this restriction, the CreateAccount element does the following:

- Logs the visitor in as a privileged user, without the knowledge of the visitor.
- Creates the account.
- Assigns the new user the appropriate ACLs (every user must belong to at least one ACL)

Here's the code that creates the new user account:

```

<SETVAR NAME="errno" VALUE="0"/>

<!-- switch temporarily to a privileged user -->
<!-- The username and password for the privileged user should be
encrypted in a property file. You should obtain them from the
property file, decrypt them, then pass them it. For this example,
they are hard-coded. -->

<USER.SU USERNAME="jumpstart" PASSWORD="jumpstart">

<USERISMEMBER GROUP="UserEditor"/>
<IF COND="Variables.errno!=1">

```

```

<THEN>
    <h3>An error has occurred creating the account (no
UserEditor
    privs).  Contact the webmaster</h3>
</THEN>
<ELSE>
    <IF COND="Variables.password!=Variables.confirm_password">
        <THEN>
            <h3>Your passwords do not match. Click the Back button
and
            try again.</h3>
        </THEN>
    </ELSE>

<!-- Get the parameters from the property file -->

    <ics.getproperty name="username" file="dir.ini"
output="unameattr"/>
    <ics.getproperty name="password" file="dir.ini"
output="passattr"/>

<!-- create the user's name in the right format for the dir
tags -->

    <ics.getproperty name="peopleparent" file="dir.ini"
output="namebase"/>
    <name.makechild context="Variables.namebase"
output="iname">
        <name.argument name="Variables.unameattr"
value="Variables.username"/>
    </name.makechild>

<!-- create the user -->

    <dir.create name="Variables.iname">
    <dir.argument name="Variables.unameattr"
value="Variables.username"/>
    <dir.argument name="Variables.passattr"
value="Variables.password"/>

<!-- additional parameters can be added here but for the
example we won't -->
<!-- In particular, if you are using LDAP, you will have to
spin through and set the values of the properties in the
property requiredPeopleAttrs in dir.ini. -->

    </dir.create>

    <IF COND="Variables.errno=0">
    <THEN>

```

```

<!-- give the new user an acl and format it correctly for
dir.addgroupmember -->

        <ics.getproperty name="groupparent" file="dir.ini"
        output="groupparent"/>
        <ics.getproperty name="cn" file="dir.ini"
output="cn"/>
        <name.makechild context="Variables.groupparent"
        output="groupid">
            <name.argument name="Variables.cn"
value="Browser"/>
        </name.makechild>

<!-- add the acl -->

        <dir.addgroupmember name="Variables.groupid"
        member="Variables.iname"/>

        <IF COND="Variables.errno=0">
            <THEN>
                <h3>Success!</h3>
            </THEN>
            <ELSE>
                <h3>User created but error adding user to
group.
                Contact the webmaster</h3>
            </ELSE>
        </IF>

        </THEN>
        <ELSE>
            <h3>Error creating user! Contact the webmaster.</
h3>
        </ELSE>
    </IF> <!-- create success check -->

        </ELSE>
</IF> <!-- passwords match -->

</ELSE>
</IF>

</USER.SU>

```



## Visitor Access in the Burlington Financial Sample Site

The Burlington Financial sample site includes a membership component that uses elements to sign up new members and log in existing members.

These visitor registration elements are not robust enough for use on a real-world web site, but can give you a starting point for your own designs. For example, Burlington Financial has sample visitor account screens, allowing visitors to register and set their own preferences, but does not use this information to restrict visitor access to certain web pages, or to make recommendations based on a member's profile.

### Membership Table

Burlington Financial uses a table named `bfmembers` to implement the membership component. (This table is created for the sample site when it is installed—none of the content applications use this table.) Although the membership elements add a row to the `bfmembers` database table for each new registered member's profile information, they do not add a row to the `SystemUsers` table.

### Users and Passwords

There is one generic user, `BFUser`, for all Burlington Financial members. The name and password are the same (`BFUser/BFUser`) and should not be changed. The member login code in Burlington Financial sets a session variable for the visitor, which is then used to identify that visitor.

Because Burlington Financial is a sample site, members' passwords are stored in the `bfmembers` table as plain text. A real web site would store passwords in encrypted format. Burlington also grants Visitor, `BFMember`, and Browser ACL privileges to entries added to the `bfmembers` table.

### Member Accounts

There are currently no elements for managing the Burlington Financial accounts. If you want to try editing or deleting members' accounts, use Content Server Explorer to modify the `bfmembers` table.

### Membership Processing Elements

There are several elements that handle processing requests for Burlington Financial members. If you have installed the Burlington Financial sample site, you can use Content Server Explorer to open and examine them. All but one is located here:

`ElementCatalog/BurlingtonFinancial/Util/Account`

The `AccountAccessScript` element is located here:

`ElementCatalog/BurlingtonFinancial/Util`

### AccountAccess.xml

This is a page template that calls pagelet elements for the header, footer, navigation menu, and the account content.

## **AccountAccessScript.xml**

This file contains three JavaScript routines (`checkSignupForm`, `checkProfileForm`, and `checkLoginForm`) that perform basic error checking on the HTML account forms. This is called from `Login.xml`, `Profile.xml`, and `SignUp.xml` elements.

## **Benefits.xml**

This page calls the `Block.xml` article template to render an article of text about the Burlington Financial site. On a real web site, the article would contain benefits information.

## **Login.xml**

This page displays the login screen for registered members and calls `LoginPost.xml` to handle the login form input. It also calls `Benefits.xml`, and `SignUp.xml` for non-members.

## **LoginPost.xml**

This pagelet element calls `ProcessLogin.xml` to display a login message.

## **Profile.xml**

This page displays an editable profile form if the visitor is registered, or else calls `SignUp.xml` if the visitor is not registered.

## **ProcessLogin.xml**

This pagelet element displays an appropriate login message, depending on whether the visitor who submitted the form is a registered member.

## **SignUp.xml**

This page displays the sign-up screen for non-registered visitors and calls the `catalogmanager` to add a row to the `bfmembers` table for a new user, or to update the `bfmembers` table for an existing user.

## Visitor Management and Commerce Connector

**Commerce Connector** is a set of Java classes that provide access to a remote Transact installation. It is based on the SecureLink Software Developer's Kit API (SLAPI), and provides CS-Direct Advantage developers with functionality previously available through the Transact Order Entry API (OEAPI), Buyer Profile API (BPAPI), and Purchase History API (PHAPI).

Commerce Connector includes enhanced Java classes that provide a high-level interface between CS-Direct Advantage and a remote Transact e-commerce system. CS-Direct Advantage developers call the Java interfaces through a set of XML or JSP tags, and thus remain shielded from the underlying details of communicating with Transact.

**Transact** is an e-commerce system that processes online transactions for products, including both physical goods and digital goods.

The Commerce Connector provides Transact functionality for:

- Order processing for one or more sellers
- Processing payment card verification
- Registering new customers
- Authenticating existing customers

### Using an SSL Server

If Content Server is installed on an SSL server, visitors making purchases from a product catalog stored on that server have all the security advantages of SSL authentication and encryption. Of course, this assumes that the server on which Content Server is installed has been properly set up for SSL, and that you have obtained and installed a certificate from a certificate authority such as VeriSign.

For instructions about configuring Content Server for an SSL server, see the *CSEE Administrator's Guide*.

### Visitor Security

You use the `VDM.GETCOMMERCEID` method (or its JSP equivalent) to determine whether a visitor is authenticated (or registered) with Transact. If the method returns a non-null value, it means that the visitor is registered.

You use the `VDM.SETCOMMERCEID` method (or its JSP equivalent) to set the commerce identifier for the current visitor upon successful authentication. A visitor without a commerce identifier is not securely identified, and must not have access to Transact-based visitor information.

### Secure Session Parameters

You should display the following parameters only when absolutely necessary, and then through an SSL (HTTPS) connection only, not a non-secure HTTP connection.

**CSUSER Method Parameters**

Parameter	Comments
accessName	
password	This is erased upon return from CSUSER.AUTHENTICATE.
userID	The same as the commerce identifier, which is the value returned by VDM.GETCOMMERCEID.
paymentInfo-ccn	The last four digits are returned by the following XML tags, or their JSP equivalents: CSUSER.CREATEPMTACCT CSUSER.DELETEPMTACCT CSUSER.GETALLPMTACCTS CSUSER.MODIFYPMTACCT

**CART Method Parameters**

Parameter	Comments
accessName	
password	
buyer-buyerID	The same as the commerce identifier, which is the value returned by the VDM.GETCOMMERCEID XML tag, or its JSP equivalent.
paymentInfo-ccn	The last four digits are returned by the following XML tags, or their JSP equivalents: CART.CHECK CART.COMMIT

For more information about all of the CART and CSUSER tags, refer to the *CSEE Developer's Tag Reference*.

**Single Sign-on for Visitors**

Content Server allows visitors to register and save preference information for single sign-on in subsequent visits. Developers can use a special cookie to pass visitor identity information from the Content Server database to Transact.

Single sign-on requires the following conditions:

- The visitor's web browser must be enabled to accept cookies.
- The Transact system and the CSEE system must both be within the same DNS domain.
- The access name/password registration database for visitors must be in the standard Transact database.
- Commerce Connector must be installed on the CSEE system.
- Commerce Connector plug-ins must be installed on the Transact system.

The following code samples illustrate how to obtain and transmit visitor login data through a cookie.

## Visitor Login: Step 1

The CS-Direct Advantage site displays a form to the visitor requesting a login name and password. The ACTION field within the FORM should use the POST method to a SSL URL to limit unauthorized viewing of visitor credentials.

For example:

```
<FORM METHOD="POST" ACTION="https://
  Variables.SERVER_NAMEVariables.PATH_INFO?pagename=doLogin"
  REPLACEALL="Variables.SERVER_NAME,Variables.PATH_INFO">
  Username:
  <INPUT TYPE="text" NAME="accessName" SIZE="20" VALUE="" />
  <BR/>
  Password:
  <INPUT TYPE="password" NAME="password" SIZE="20" VALUE="" />
  <BR/>
  <INPUT TYPE="SUBMIT" VALUE="LogIn" />
</FORM>
```

## Visitor Login: Step 2

The target page element of the posted FORM does the following:

- Uses the CSUSER.AUTHENTICATE tag, or its JSP equivalent, to verify visitor credentials
- Extracts the userID field from the CSUSER object.
- Sets the userID with the VDM.SETCOMMERCEID XML tag, or its JSP equivalent.

For example, on a visitor login page:

```
<!-- If we have accessName and password, log in and set the ID.-->
<IF COND="IsVariable.accessName=true">
  <THEN>

    <IF COND="IsVariable.password=true">
      <THEN>
        <!-- accessName and password given -->
        <CSUSER.CREATE NAME="csuser" />
        <CSUSER.SETPARAMETER NAME="csuser"
          FIELD="accessName" VALUE="Variables.accessName" />
        <CSUSER.SETPARAMETER NAME="csuser"
          FIELD="password" VALUE="Variables.password" />
        <CSUSER.AUTHENTICATE NAME="csuser" VARNAME="result" />

        <IF COND="Variables.result=true">
          <THEN>
            <!-- Authentication Succeeded -->
            <CSUSER.GETPARAMETER NAME="csuser"
              FIELD="userID" VARNAME="commerceID" />
            <VDM.SETCOMMERCEID ID="Variables.commerceID" />
```

```

        </THEN>
        <ELSE>
        <!-- Authentication Failed. -->
        </ELSE>
        </IF>
    </THEN>
    <ELSE>
    <!-- No password -->
    </ELSE>
    </IF>
</THEN>
<ELSE>
<!-- No accessName -->
</ELSE>
</IF>

```

### Visitor Login: Step 3

Before a returning a link or redirect to a Transact page, do the following:

1. Get the visitor ID from the VDM object with the `VDM.GETCOMMERCEID` tag, or its JSP equivalent.
2. Calculate a value for the cookie to be sent to Transact with the `CSMAC.COOKIEVALUE` XML tag, or its JSP equivalent.
3. Set a cookie named `CSCookie` in the visitor's browser with the Content Server `satellite.cookie` tag.

For example:

```

<SETVAR NAME="CSCookieDomain" VALUE=".openmarket.com"/>
<VDM.GETCOMMERCEID VARNAME="commerceID"/>
<IF COND="IsVariable.commerceID=true">
<THEN>

    <ICS.GETPROPERTY NAME="tx.store_0.storeID" FILE="transact.ini"
    OUTPUT="defStoreID"/>

    <CSMAC.COOKIEVALUE USERID="Variables.commerceID"
        STOREID="Variables.defStoreID"
        VARNAME="cookieVal"/>
    <IF COND="IsVariable.cookieVal=true">
    <THEN>
        <satellite.cookie name= "CSCookie"
value="Variables.cookieVal"
        timeout="-1" domain="Variables.CSCookieDomain"/>
    </THEN>
    <ELSE>
        <!-- CSMAC.COOKIEVAL failed, can't set CSCookie -->
    </ELSE>
    </IF>
</THEN>
</IF>

```

## Visitor Login: Step 4

Once the CSCookie has been set, connections to Transact pages are available without requiring visitor re-authentication. You can use the CSMAC tags to construct some of the URLs for Transact.

For example, the following code sets the variable named StatementURL to hold the URL for the Transact smart statement of a registered user. Use this code to make an HTML hyperlink:

```
<CSMAC.TRANSACTSERVER PROTOCOL="https" VARNAME="httpsURL"/>
<SETVAR NAME="StatementURL" VALUE="Variables.httpsURL"/>

<ICS.GETPROPERTY NAME="tx.store_0.storeID" FILE="transact.ini"
OUTPUT="defStoreID"/>

<CSMAC.PAYLOAD STOREID="Variables.defStoreID"
  VALUE="key_store_seqid=Variables.defStoreID"
  VARNAME="payload"/>
<SETVAR NAME="StatementURL"
  VALUE="Variables.httpsURL/tms-ts/bin/
statement.cgi?Variables.payload"/>
```





## Chapter 24

# Commerce Integration

This chapter provides an overview of how CS-Direct Advantage, Commerce Connector, and Transact handle electronic commerce transactions.

This chapter includes the following sections:

- What Is an Online Store?
- What Is Transact?
- What Is Commerce Connector?
- What Is a Shopping Cart?
- Visitor Security
- Troubleshooting Shopping Carts

## What Is an Online Store?

An **online store** is a catalog of information about products that you sell over the Internet. When a **visitor** (or customer) makes a purchase from your site, the store assembles product and order information (such as quantity, price, shipping weight, and sales tax) in a **shopping cart**, which you **commit** to a FatWire™ Transact installation for processing. Transact can process transactions for the following kinds of products:

### Tangible Goods

Tangible goods are physical products such as books, clothing, or auto parts that visitors can purchase online.

### Digital Goods

Digital goods are electronic products such as software, graphic files, or documents that visitors can access online.

## Digital Subscriptions

Digital subscriptions are periods of access to online content, such as web-based magazines, stock quotes, or news delivery.

## What Is Transact?

Transact is a FatWire™ electronic commerce application that maintains information about registered customers and e-commerce orders in its own database. Transact performs a full range of e-commerce tasks, including the following:

- Authenticating registered customers for an online store
- Processing electronic payment transactions and transfer of funds
- Processing sales tax and shipping orders for physical goods
- Managing digital subscriptions and access to digital goods

The following standard Transact features are handled differently with CS-Direct Advantage and CS-Engage:

- Microtransactions (not supported)
- Digital coupons (CS-Engage implements discounting)
- View order (CS-Direct Advantage maintains the shopping cart)

## What Is Commerce Connector?

**Commerce Connector** is a set of Java classes that provide access to a remote Transact installation. It is based on the Transact SecureLink Software Developer's Kit API (SLAPI), and provides CS-Direct Advantage developers with functionality otherwise available with the Transact Order Entry API (OEAPI), Buyer Profile API (BPAPI), and Purchase History API (PHAPI).

Commerce Connector includes enhanced Java classes which provide a high-level interface between CS-Direct Advantage and a remote Transact e-commerce system. CS-Direct Advantage developers call the Java interfaces through a set of XML or JSP tags, and thus remain shielded from the underlying details of communicating with Transact.

Commerce Connector provides Transact functionality for:

- Order processing for one or more sellers
- Processing payment card verification
- Registering new customers
- Authenticating existing customers

The Commerce Connector kit consists of:

- Transact Plug-ins, which are typically installed on the Transact front host.
- The Catalog Client, which is installed on the CS-Direct Advantage host.

The Catalog Client installation includes a collection of Java interfaces and classes which provide CS-Direct Advantage with an interface to a remote Transact system. The corresponding XML and JSP tags are installed as part of CS-Direct Advantage.

## Installing Commerce Connector and Configuring a Store

Make sure you complete the following installation and configuration tasks before conducting commerce from your online store:

Task	Reference
Configure Content Server for an SSL server.	<i>CSEE Administrator's Guide</i>
Install the Commerce Connector catalog client on the CS-Direct Advantage host.	<i>Commerce Connector Release Notes: Catalog Client Installation</i>
Generate self-signed keys and certificates.	<i>Commerce Connector Release Notes: Catalog Client Installation</i>
Install the Commerce Connector plug-ins on the Transact front host.	<i>Commerce Connector Release Notes: Transact Plug-ins Installation</i>
Register as a seller with Transact and get a store ID.	<i>Transact: Store Configuration</i>
Configure your online store with Transact.	<i>Transact: Store Configuration</i>
Add store properties to the <code>transact.ini</code> file on the CS-Direct Advantage host.	<i>Installing the CSEE Content Applications</i>

### For More Information

See the following Transact documents for essential information about planning, configuring, and managing your online store:

- *Internet Commerce for Sellers* for an overview of running a store on the web, as well as a comprehensive list of business-related and hosting-related tasks.
- *Store Configuration* for instructions about setting up your online store for transaction processing with Transact.
- *Store Management* for information about using the Transact Commerce Center to perform day-to-day tasks like managing customer accounts, orders, and subscriptions, and downloading store reports.

## Using Content Server with an SSL Server

If Content Server is installed on an SSL server, visitors making purchases from a product catalog stored on that server have all the security advantages of SSL authentication and encryption. Of course, this assumes that the server on which Content Server is installed has been properly set up for SSL, and that you have obtained and installed a certificate from a certificate authority such as VeriSign.

For instructions about configuring Content Server for an SSL server, see the *CSEE Administrator's Guide*.

## What Is a Shopping Cart?

A **shopping cart** is a set of XML or JSP elements that collects information about a purchase, adds that information to a cart object, and sends, or commits, that cart object via the Commerce Connector to Transact for validation and processing. The shopping cart lets visitors make purchases without going through the Transact order form. You create your own customized shopping experience for site visitors, and take full advantage of the payment and fulfillment features of Transact.

## What Does a Shopping Cart Do?

The elements that comprise the shopping cart need to perform certain tasks to verify and complete an order, such as:

- Getting an existing cart from the CS-Direct Advantage commerce context.
- Saving a cart that has been modified to the commerce context.
- Adding or deleting cart items, in response to customer selections.
- Applying any existing discounts to cart items and the cart total.
- Applying North American sales tax or European VAT charges.
- Applying shipping charges.
- Performing currency conversions.

## Cart and Item Parameters

The shopping cart needs to collect general information about the cart (or order), specific information about order items, and then send that information to Transact.

The following are examples of general cart information:

- The visitor's name and address.
- The address to which the desired items should be shipped.
- The name of the shipping company.
- The payment instrument information, such as credit card number and expiration date.

The following are examples of information about specific items:

- Product price and quantity
- Delivery information
- Tax amounts
- Subscription information

For descriptions of parameters that apply to carts as well as parameters that apply to individual items, see the *CSEE Developer's Tag Reference*.

## What Is the Commerce Context?

During a visitor session on the delivery system (the live site), CS-Direct Advantage creates and saves a **commerce context** for the visitor. The current shopping cart is maintained by the commerce context.

You use the commerce context XML or JSP tags to save cart objects to and retrieve cart objects from the commerce context. Shopping cart objects, when present, are persistent throughout the visitor session (that is, they are stored in the CSEE database and then flushed when the session ends).

There are several commerce context tags (or methods) that apply to shopping carts:

### XML Tags

```
COMMERCECONTEXT.GETABANDONEDCARTSESSIONS
COMMERCECONTEXT.GETCURRENTCART
COMMERCECONTEXT.GETSESSIONCART
COMMERCECONTEXT.LOGOUT
COMMERCECONTEXT.SAVEALL
COMMERCECONTEXT.SETCURRENTCART
```

### JSP Tags

```
commercecontext:getabandonedcartsessions
commercecontext:getcurrentcart
commercecontext:getsessioncart
commercecontext:logout
commercecontext:saveall
commercecontext:setcurrentcart
```

These methods are described in the *CSEE Developer's Tag Reference*.

In addition to the current shopping cart, the commerce context maintains the following information about CS-Engage assets:

- List of segments for which the visitor qualifies
- List of promotions for which the visitor qualifies
- Time object that is used for calculating time-based rules
- Utility object that gives you access to product attributes

For more information about these and other related topics, see Chapter 35, “Creating Visitor Data Assets,” and Chapter 37, “Coding CS-Engage Pages.”

For information about CS-Engage tags, see the *CSEE Developer's Tag Reference*.

## Working with Shopping Carts

This section provides descriptions and code samples for performing basic shopping cart tasks.

### Getting and Saving Carts

Use the following XML tag, or its JSP equivalent, to get the cart from the commerce context:

```
<COMMERCECONTEXT.GETCURRENTCART VARNAME="currentcart" />
```

The first time you call `COMMERCECONTEXT.GETCURRENTCART`, CS-Direct Advantage creates an empty cart if no cart already exists. The cart object persists throughout the browser session.

Every time you modify the cart (for example, by adding an item or setting a parameter), use the following tag to save the cart to the commerce context:

```
<COMMERCECONTEXT.SETCURRENTCART VARNAME="currentcart" />
```

## Adding Items to a Cart

To add a product item to a cart, follow these top-level steps:

1. Get the cart from the commerce context.
2. Create an assetset for the specified product.
3. Build a list object to hold the product attributes.
4. Add that list object to the cart.
5. Save the modified cart to the commerce context.

### Code Example

In the following example, the element is named `cart.xml`, and the input variable, `additem` is passed as part of the URL string:

```
http://demohost.com/cgi-bin/gx.cgi/
AppLogic+FTContentServer?pagename=OpenMarket/Demos/
cart&additem=956952239159
```

Here's a sample code fragment from an element called `cart.xml`:

```
<COMMERCECONTEXT.GETCURRENTCART VARNAME="cart" />

<!-- "additem" is the asset ID of the product asset to add -->
<IF COND="IsVariable.additem=true"><THEN>

    <!-- create an assetset of attributes for the specified product -->
    <ASSETSET.SETASSET TYPE="Products" NAME="alist"
    ID="Variables.additem" />

    <!-- create a list for the call to GETASSETLIST -->
    <LISTOBJECT.CREATE NAME="lista"
    COLUMNS="attributename,direction" />
    <LISTOBJECT.ADDROW NAME="lista" attributename="Name"
    direction="descending" />
    <LISTOBJECT.ADDROW NAME="lista" attributename="Price"
    direction="descending" />
    <LISTOBJECT.TOLIST NAME="lista" LISTVARNAME="listout" />

    <!-- apply the sort list to the assetset and retrieve the
    resultset -->
    <ASSETSET.GETASSETLIST NAME="alist" LIST="listout"
    LISTVARNAME="varlist" />
    <LISTOBJECT.CREATE NAME="offer" COLUMNS="name,value" />
    <LISTOBJECT.ADDROW NAME="offer" name="UniqueID"
    value="varlist.assetid" />
    <LISTOBJECT.ADDROW NAME="offer" name="Name"
    value="varlist.SORT_Name" />
    <LISTOBJECT.ADDROW NAME="offer" name="Type" value="tangible" />
    <LISTOBJECT.ADDROW NAME="offer" name="OfferURL"
    value="pagename=Variables.pagename" />
    <LISTOBJECT.TOLIST NAME="offer" LISTVARNAME="offerlist" />
```

```

<!-- add the item to the cart, and save the cart to commerce
context. -->
<CART.ADDITEM NAME="cart" ID="Variables.additem" QUANTITY="1"
    PRICE="varlist.SORT_Price" STOREID="400030" LIST="offerlist"
    VARNAME="addstatus"/>
<COMMERCECONTEXT.SETCURRENTCART CART="cart"/>
</THEN></IF>

```

## Checking a Cart with Transact

Use the following XML tag, or its JSP equivalent, to **check** a cart with Transact to verify that is acceptable:

```
<CART.CHECK NAME="cartname" VARNAME="varname" />
```

Transact returns a value of `true` or `false` in the variable `varname`, and always returns values in the cart object identified by the following fields:

- `subTotal` – The total cost of items.
- `shippingInfo-*` – Various shipping parameters.
- `shippingInfo-shippingTax-*` – Various shipping tax parameters.
- `tax-*` – Various tax parameters.
- `totalSalesAmount` – The sum of `subTotal`, `shippingCost`, and `tax-taxAmount`.
- `storeN-*` – A set of parameters from the `transact.ini` file, where *N* is the store number, and *\** represents one of several possible parameters. (Normally, the developer is only concerned with `storeID` and `currencyCode`.)
- `paymentInfo-brandID` – The CS-Direct Advantage GUID of a specific payment brand, such as Visa or MasterCard.
- `paymentInfo-accountID` – The Transact GUID of a payment instrument stored for a registered buyer.

If there are problems resolving fields, Transact returns the following values:

```

billToAddress-city
billToAddress-postalCode
billToAddress-county
shipToAddress-postalCode

```

See the *CSEE Developer's Tag Reference* for details on cart parameters in general, as well as those parameters returned by Transact after check operations.

## Committing a Cart to Transact

Use the following XML tag, or its JSP equivalent, to **commit**, or send, a checked cart to the Transact for transaction processing:

```
<CART.COMMIT NAME="cartname" VARNAME="varname" />
```

Only a successfully checked cart may be committed to Transact. If you call `CART.COMMIT` for a cart that has not been checked, then that cart is implicitly checked, and Transact returns the same values listed above for check operations.

The following values are returned by successful `CART.COMMIT` operations:

- `orderDate` – A Java timestamp indicating the time the order was entered into CS-Direct Advantage (number of milliseconds since the epoch).
- `orderId` – The GUID that uniquely identifies the order on CS-Direct Advantage.
- `orderNumber` – An integer that uniquely identifies the order within the specific store.
- `smartReceipt` – The URL to the Transact version of the Smart Receipt page

See the *CSEE Developer's Tag Reference* for details on cart parameters in general, as well as the parameters returned by Transact after committing.

## Visitor Security

You use the `VDM.GETCOMMERCEID` method, or its JSP equivalent, to determine whether a visitor is authenticated (or registered) with Transact. If the method returns a non-null value, it means that the visitor is registered.

You use `VDM.SETCOMMERCEID`, or its JSP equivalent, to set the commerce identifier for the current visitor upon successful authentication. A visitor without a commerce identifier is not securely identified, and must not have access to Transact-based visitor information.

## Secure Session Parameters

You should display the following parameters only when absolutely necessary, and then only through an SSL (HTTPS) connection, not a non-secure HTTP connection.

### CSUSER Method Parameters

Parameter	Comments
<code>accessName</code>	
<code>password</code>	This is erased upon return from <code>CSUSER.AUTHENTICATE</code> .
<code>userID</code>	The same as the commerce identifier, which is the value returned by <code>VDM.GETCOMMERCEID</code> .
<code>paymentInfo-ccn</code>	The last four digits are returned by the following XML tags, or their JSP equivalents: <code>CSUSER.CREATEPMTACCT</code> <code>CSUSER.DELETEPMTACCT</code> <code>CSUSER.GETALLPMTACCTS</code> <code>CSUSER.MODIFYPMTACCT</code>

### CART Method Parameters

Parameter	Comments
<code>accessName</code>	
<code>password</code>	
<code>buyer-buyerID</code>	The same as the commerce identifier, which is the value returned by the <code>VDM.GETCOMMERCEID</code> XML tag, or its JSP equivalent.



Parameter	Comments
paymentInfo-ccn	The last four digits are returned by the following XML tags, or their JSP equivalents: CART.CHECK CART.COMMIT

## Troubleshooting Shopping Carts

In case of problems with shopping carts, check the following conditions first:

- Commerce Connector installation errors
- Commerce Connector data file configuration errors
- Missing .jar files or libraries
- Incorrect library path
- Expired or otherwise invalid secret keys
- Inability to contact the Transact installation

You should also determine which tag is causing the problem, find out what `errno` is being returned by the tag, and examine the messages in `Variables.errdetail1`.

Check output (exception stack trace) in the `kjs` log file. Usually, earlier exceptions are more informative than later ones because later exceptions are often side effects of the former.

Set the following debug flags:

- In `futuretense.ini`, set `ft.debug=1`
- In `transact.ini`, set `tx.debugMode=1`

## Checking the .jar File and Libraries

CS-Direct Advantage ships with a stub `CommerceConnector.jar` file (~80kb). This is replaced with the real `CommerceConnector.jar` file (~864kb) when Commerce Connector is installed. Confirm that the `CommerceConnector.jar` file is the correct size, and that it is in the `CLASSPATH` for your application server.

Commerce Connector requires access to several shared libraries. Confirm that `LD_LIBRARY_PATH` for your application server is set such that it can find the Commerce Connector libraries (for example, `osl_sdk`, `osl_oe`, and `.so` files).

## Verifying TRANSACT.INI Properties

If you're using the stub `CommerceConnector.jar`, set `transact.ini` as shown:

```
cm.class=com.openmarket.commerceengine.stubengine.StubEngine
```

If you're using the real `CommerceConnector.jar`, set `transact.ini` as shown:

```
cm.class=com.openmarket.transactengine.TransactEngine
```

If you see `ClassNotFoundException` for either of these, you have either the wrong .jar file, or the wrong name for `cm.class`.

## Other TRANSACT.INI Properties

- `tx.CEngineDirectory` – Prefix for many of the other files needed by Commerce Connector.
- `tx.certificates` – Directory in which Commerce Connector finds `.der` files for certificate checking of the Transact SSL connection. This directory cannot contain any files other than certificates. FatWire ships two root certificates: `RSA.der` (VeriSign) and `ssleayPCACert.der`.

If you see a message like "Can't Validate Certificate chain", this means the Transact SSL web server is not using a known certificate. You can disable certificate checking (as a temporary solution only) by deleting this property from `transact.ini` and restarting your application server. You can see which certificate Transact expects by opening to an SSL cgi with a browser and examining the certificate. Make sure the customer receives a good certificate.

- `tx.transact*` – Make sure these point to the right place. In particular, set the following: `tx.transactScheme=https`.
- `tx.defaultStore.accessname`, `tx.defaultStore.password` – These must not be blank. Blank values result in `COMMERCECONTEXT.GETCURRENTCART` failing to create a new blank cart, and additional exceptions when a cart tag is invoked.
- `tx.defaultStore.catalogPort`, `tx.defaultStore.fulfillmentPort` – These must not be blank. In particular, the `*Port` values must be integers.
- `tx.numStores` – This integer is a loop counter (greater than zero) used in finding override parameters for each store. There must be a set of properties `tx.store_X.prop` where `X` goes from `tx.store_0.storeID` to `tx.store_N.storeID`.

If `X` is larger than the number of sets of store properties, this causes failures connecting to Transact.

- `tx.store_X.storeID` – This must be the (non-blank) number of the Transact store which is assigned to this set of `store_X` properties. Do not duplicate this number for different `X`'s -- reduce the number of stores instead.
- `tx.store_X.accessname`, `tx.store_X.password` – These are the merchant credentials for the Transact store `tx.store_X.storeID`. Incorrect values cause failures connecting to Transact.
- `tx.store_X.*` – All other properties are used to override the corresponding `tx.defaultStore.*` value. If left blank, the `tx.defaultStore.*` value is used for this property for this store.

## Checking Key Expiration in Key Files

Keys are usually kept in a `secrets/flat_0.kf` file, an ASCII file that has entries similar to the following example. Key files (as well as any ASCII files) can be corrupted by drag-and-drop operations between Windows and UNIX systems.

Fields in the following keys examples are defined as follows:

```
0:<storeID>:      <keynum>      :<startDate>:<endDate>:<expDate>
```

```
0:400004:5:eddfdlf68e42d15f963b738e16ab45ae:962409600:965088000
:967766400
```

```

O:400004:7:5d5a842a6ec22826096b5cfc6d160338:965088000:967766400
:970358400
O:400004:9:453576715914d1156d8b498951fe5d81:967766400:970358400
:973036800
O:400005:5:9525d0ac9ce6e50f9002b6f505187f3d:962409600:965088000
:967766400
O:400005:7:88f0a8fb7d218bb39cacf90432236a7b:965088000:967766400
:970358400
O:400005:9:4f7ee458fdda0dfe08f6a58889b67d68:967766400:970358400
:973036800

```

The dates are in GMT, in seconds since the UNIX epoch. So for storeID 400005, keynum 9 (the last line), the key is valid for the month of September 2000.

```

larsen@wally% ~larsen/b.sh/fmtclock
967766400:970358400:973036800
967766400 = Thu Aug 31 20:00:00 EDT 2000 = Fri Sep 01 00:00:00
GMT 2000
970358400 = Sat Sep 30 20:00:00 EDT 2000 = Sun Oct 01 00:00:00
GMT 2000
973036800 = Tue Oct 31 19:00:00 EST 2000 = Wed Nov 01 00:00:00
GMT 2000

```



## Chapter 25

# The HelloAssetWorld Sample Site

The HelloAssetWorld sample site is a sample web site built using Content Server and CS-Direct. It is meant to provide a simple entry point into the process of building a web site with CS-Direct. This chapter focuses on the steps that a developer would take in creating this simple web site; further information on HelloAssetWorld's configuration and users are in the *CSEE Administrator's Guide* and the *CSEE User's Guide*.

This chapter contains the following sections:

- Overview
- Modified Asset Types
- HelloAssetWorld Templates
- The HelloQuery Asset

## Overview

The HelloAssetWorld site has a simple design; it is composed of one page, as shown in the following screen capture:



The stories that appear on this web page change depending upon the article that you choose to view, but the layout of the page remains the same.

To view the HelloAssetWorld sample site yourself, enter the following URL into your web browser:

`http://server_name/servlet/ContentServer?pagename=HelloAssetWorld/Page/HelloPageTemplate`

## HelloAssetWorld Templates

The HelloAsset World web page is composed of three templates:

- The HelloArticle template, which displays the article that you select and that article's associated image.
- The HelloCollection template, which displays hyperlinks to a collection of articles that you can view.
- The HelloPage template, which is the containing page. It displays the HelloAssetWorld banner graphic and calls the HelloArticle and Hello Collection templates.

## HelloAssetWorld Asset Types

The asset types used in the HelloAssetWorld site are modified from asset types used in the Burlington Financial sample site, described in Chapter 27, “The Burlington Financial Sample Site.” A list of the asset types used in HelloAssetWorld follows:

- The Page asset type, which performs several functions:
  - It allows users to create a site hierarchy by **placing** the page. Placing a page gives it an entry in the `SitePlanTree` table and allows it to be viewed under the Placed Pages node of the Site Plan Tree.
  - It allows you to associate assets of various types with it. For example, you can associate Collection assets and Article assets with a Page asset.

The instance of the Page asset type used in the HelloAssetWorld site, `HelloPage`, has a collection called `HelloCollectionHello` associated with it. The Page asset type is a core asset type which is provided with CS-Direct, and has not been modified.
- The `HelloArticle` asset type, which contains an article. `HelloArticle` assets can have `HelloImage` assets associated with them. The `HelloArticle` asset type has been modified from the Article asset type that is provided with Burlington Financial.
- The `HelloImage` asset type, which contains an image. The `HelloImage` asset type has been modified from the `ImageFile` asset type that is provided with Burlington Financial.
- The Query asset type, which queries the database and returns the `HelloArticle` assets that display on the web site. This is a core asset type, which is provided with CS-Direct and has not been modified.
- The Collection asset type, which orders the results that the query asset returns. This is a core asset type, which is provided with CS-Direct and has not been modified.
- The Template asset type, which renders the various asset types. This is a core asset type, which is provided with CS-Direct and has not been modified.

## Modified Asset Types

Most of the asset types used in the HelloAssetWorld sample site are core asset types, and hence cannot be modified. The `HelloArticle` and `HelloImage` asset types, however, are simplified versions of the Article and ImageFile asset types that are provided with CS-Direct. Each asset type has a new asset descriptor file that is based on the asset descriptor files for the Article and ImageFile asset types. The simplified asset descriptor files are shown in the following sections.

### The HelloArticle Asset Type

The `ASSET` tag, shown in the following line, is the standard opening for all asset descriptor files. Among other things, it names the new asset type and specifies the asset's `defdir`, the default directory where uploaded items are stored.

```
<ASSET NAME="HelloArticle" DESCRIPTION="HelloArticle"
  MARKERIMAGE="/Xcelerate/data/help16.gif" PROCESSOR="4.0"
  DEFDIR="c:\FutureTense\Storage\HelloArticle">
```

The next lines create a text field for the article's headline.

```

<PROPERTIES>
<PROPERTY NAME="Headline" DESCRIPTION="Headline">
<STORAGE TYPE="VARCHAR" LENGTH="255" />
<INPUTFORM TYPE="TEXT" WIDTH="48" MAXLENGTH="255"
REQUIRED="YES" />
<SEARCHFORM DESCRIPTION="Headline contains" TYPE="TEXT"
WIDTH="48" MAXLENGTH="255" />
</PROPERTY>

```

The next lines create a text field for the article's byline.

```

<PROPERTY NAME="Byline" DESCRIPTION="Byline">
<STORAGE TYPE="VARCHAR" LENGTH="100" />
<INPUTFORM TYPE="TEXT" WIDTH="48" MAXLENGTH="100"
REQUIRED="YES" />
<SEARCHFORM DESCRIPTION="Byline contains" TYPE="TEXT"
WIDTH="48" MAXLENGTH="100" />
</PROPERTY>

```

The following lines create an upload field where content editors and authors can type in the content of an article's body. This content will be stored in the defdir specified in the ASSET tag.

```

<PROPERTY NAME="urlBody" DESCRIPTION="Body">
<STORAGE TYPE="VARCHAR" LENGTH="2000" />
<INPUTFORM TYPE="TEXTAREA" COLS="300" ROWS="300" REQUIRED="YES"
/>
</PROPERTY>
</PROPERTIES>
</ASSET>

```

## The HelloImage Asset Type

The ASSET tag, shown in the first line below, is the standard opening for all asset descriptor files. Among other things, it names the new asset type and specifies the asset's defdir, the default directory where uploaded items are stored.

```

<ASSET NAME="HelloImage" DESCRIPTION="HelloImage"
MARKERTEXT="*" PROCESSOR="4.0"
DEFDIR="c:\FutureTense\Storage\HelloImage">

```

Then, the next lines create an upload field for the image file.

```

<PROPERTIES>
<PROPERTY NAME="urlfile" DESCRIPTION="Image File">
<STORAGE TYPE="VARCHAR" LENGTH="255" />
<INPUTFORM TYPE="UPLOAD" WIDTH="36" REQUIRED="NO"
LINKTEXT="HelloImage" />
</PROPERTY>

```

The following lines create a drop-down select and specify how the search field for mimetypes will appear on the Advanced Search form. The SQL statement supplied as a value for the SQL parameter for the INPUTFORM tag queries the database to supply mimetypes for the text of the dropdown.

```

<PROPERTY NAME="mimetype" DESCRIPTION="Mimetype">
<STORAGE TYPE="VARCHAR" LENGTH="36" />

```



```

<INPUTFORM TYPE="SELECT" SOURCETYPE="TABLE"
TABLENAME="mimetype" OPTIONDESCKEY="description"
OPTIONVALUEKEY="mimetype" SQL="SELECT mimetype, description
FROM mimetype WHERE keyword = 'image' AND isdefault = 'y'"
INSTRUCTION="Add more options to mimetype table with
isdefault=y and keyword=image"/>

```

The next line specifies how the mimetype field will appear on the Advanced Search form. As shown above, the SQL supplied here queries the database for mimetypes to fill the dropdown select with.

```

<SEARCHFORM DESCRIPTION="Mimetype" TYPE="SELECT"
SOURCETYPE="TABLE" TABLENAME="mimetype"
OPTIONDESCKEY="description" OPTIONVALUEKEY="mimetype"
SQL="SELECT mimetype, description FROM mimetype WHERE keyword =
'image' AND isdefault = 'y'"/>
</PROPERTY>

```

The following lines create a text field that allows users of the management system to input alternate text for the image. The SEARCHFORM tag specifies how the Alt Text contains field will appear on the Advanced Search form.

```

<PROPERTY NAME="alttext" DESCRIPTION="Alt Text">
<STORAGE TYPE="VARCHAR" LENGTH="255"/>
<INPUTFORM TYPE="TEXT" WIDTH="48" MAXLENGTH="255"
REQUIRED="NO"/>
<SEARCHFORM DESCRIPTION="Alt Text contains" TYPE="TEXT"
WIDTH="48" MAXLENGTH="255"/>
</PROPERTY>

</PROPERTIES>
</ASSET>

```

## HelloAssetWorld Templates

The HelloAssetWorld sample site uses three template assets to render the assets that were described previously. The following sections describe these template assets.

### The HelloArticle Template

The HelloArticleTemplate renders HelloArticle assets. The template uses the following variables:

Variable	Value	Source
tid	The current template's ID.	The tid variable is set in the resargs1 field of the SiteCatalog table. The value is set automatically when the template is created.
c	The type of content that the template displays.	The c variable is set in the resargs1 field of the SiteCatalog table. The value is set using the Asset Type field on the New Template form.
cid	The ID of the asset to load.	The cid variable is passed in by the HelloPage template.
picture:oid	The object ID of a HelloImage asset that is associated with the HelloArticle asset.	The picture:oid variable is obtained by loading the current HelloArticle asset and using the ASSET.CHILDREN tag to find information on associated HelloImage assets.
picture:alttext	The alternate text for the associated HelloImage asset.	The picture:alttext variable is obtained by loading the current HelloArticle asset and using the ASSET.CHILDREN tag to find information on associated HelloImage assets.
picture:mimetype	The mimetype of the associated HelloImage asset.	The picture:mimetype variable is obtained by loading the current HelloArticle asset and using the ASSET.CHILDREN tag to find information on associated HelloImage assets.
asset:headline	The value in the Headline field of this HelloArticle asset.	The asset:headline variable is obtained by scattering the information in the HelloArticle asset.
asset:byline	The value in the Byline field of this HelloArticle asset.	The asset:headline variable is obtained by scattering the information in the HelloArticle asset.

Variable	Value	Source
artID	The ID of the article to display in the HelloArticle template.	On the first page view, this is set in the <code>resdetails</code> field of the ElementCatalog entry. On subsequent viewings, this is passed in by the HelloCollection template.

The following lines are the standard beginning for an article template. They appear when you click the XML or JSP buttons on the New Template form in the CSEE user interface.

```
<?xml version="1.0" ?>
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- HelloArticle/HelloArticleTemplate
-
- INPUT
-
- OUTPUT
-
-->
```

The next line uses the open `satellite.tag` tag to indicate that this page will be cached on CS-Satellite. The open `satellite.tag` tag must be the first line following the XML version tag and default input/output comment.

```
<!-- the satellite.tag tag pair indicates to Content Server
that the content rendered in this pagelet will be cached on CS-
Satellite -->
<satellite.tag type="open"/>
```

The `RENDER.LOGDEP` tag marks the template as a cache dependency item. This means that when the template is modified, any outdated copies of the template will be removed from the Content Server and CS-Satellite caches and replaced with current versions automatically.

```
<IF COND="IsVariable.tid=true">
<THEN>
    <RENDER.LOGDEP    cid="Variables.tid" c="Template"/>
</THEN>
</IF>

<table border="0" cellspacing="2" cellpadding="2">

<tr>
<td>
```

The following `ASSET.LOAD` tag loads a HelloArticle asset using the asset's ID, which is stored in `Variables.cid`. This value is passed in to the HelloArticle template by the HelloPage template.

```
<!-- asset load will mark the asset as an 'exact' dependent of
the pagelet being rendered -->
```

```
<ASSET.LOAD NAME="helloArticleAsset" TYPE="Variables.c"
OBJECTID="Variables.cid"/>
```

The next line uses the `ASSET.CHILDREN` tag to load any `HelloImage` assets that are associated with the article. `ASSET.CHILDREN` creates a list which contains the information necessary to display the `HelloImage` asset.

```
<ASSET.CHILDREN NAME="helloArticleAsset" LIST="picture"
TYPE="HelloImage"/>
```

These lines check to see if there is a `HelloImage` asset associated with the current article. If there is no associated `HelloImage` asset, the template only displays the text of the article.

```
<!--Check to see if the list (which contains information to
display an image) exists--if the list doesn't exist, display
the article text only. -->
<IF COND="IsList.picture=true">
  <THEN>
    <!--Log the image as a dependancy.-->
    <RENDER.LOGDEP cid="picture.oid" c="HelloImage"/>
```

These lines use the `RENDER.SATELLITEBLOB` tag to display the associated image.

```
<!--Display the image.-->
<RENDER.SATELLITEBLOB BLOBTABLE="HelloImage" BLOBKEY="id"
BLOBCOL="urlfile" BLOBWHERE="picture.oid"
BLOBHEADER="picture.mimetype" SERVICE="IMG SRC"
ARGS_ALT="picture.alttext" ARGS_ALIGN="left"/>
</THEN>
</IF>
</td>
</tr>

<tr>
<td>
```

Then this `ASSET.SCATTER` tag gets all of the `HelloArticle` asset's primary fields.

```
<!-- get all the primary table fields of the asset -->
<ASSET.SCATTER NAME="helloArticleAsset" PREFIX="asset"/>
```

The following `CSVAR` tag displays the contents of the asset's fields.

```
<!-- display the headline-->

<h3><CSVAR NAME="Variables.asset:headline"/></h3>
</td>
</tr>

<tr>
<td>
<CSVAR NAME="Variables.asset:byline"/>
</td>
</tr>

<tr>
<td>
```

Because the Body field may contain an embedded link, it must be retrieved using the `ics.getvar` tag and displayed using the `RENDER.STREAM` tag, shown in the following lines:

```
<!-- display the body-->
<ics.getvar name="asset:urlbody" encoding="default"
output="bodyvar" />
<RENDER.STREAM VARIABLE="bodyvar" /><br/>
</td></tr>

</table>
<satellite.tag type="closed"/>

</FTCS>
```

## The HelloCollection Template

The collection template displays the HelloCollectionHello collection. It uses the following variables:

Variable	Value	Source
tid	The current template's ID.	The tid variable is set in the resargs1 field of the SiteCatalog table. The value is set automatically when the template is created.
c	The type of content that the template displays.	The c variable is set in the resargs1 field of the SiteCatalog table. The value is set using the Asset Type field on the New Template form.
cid	The ID of the asset to load.	The cid variable is passed in by the HelloPage template.
tid	The current template's ID.	The tid variable is set in the resargs1 field of the SiteCatalog table. The value is set automatically when the template is created.
p	The ID of the page that generates the hyperlink—in this case, the current template.	
ApprovedArticles:id	The ID of the current HelloArticle in the collection.	
ApprovedArticles:name	The name of the current HelloArticle in the collection.	

Variable	Value	Source
artID	On line 23 this variable contains the ID of the HelloArticle being displayed by the HelloArticleTemplate. On line 33, the value is the ID of the current article in the collection.	The variable used on line 23 is passed in by the HelloPage template. The variable set on line 33 gets its value from the ID of the current HelloArticle in the collection. It is then passed to the HelloPage and HelloArticle templates.
pageID	The ID of the HelloPage asset.	
referURL	The URL generated by the RENDER.GETPAGEURL tag.	

In the case of the HelloCollection template, the opening **satellite.tag** tag not only indicates that the pagelet will be cached to CS-Satellite, it also indicates that all hyperlinks will be automatically transformed into Satellite links, if the page is viewed using CS-Satellite.

```
<!-- the satellite.tag tag pair indicates to Content Server
that the content rendered in this pagelet will be cached on CS-
Satellite -->
<satellite.tag type="open"/>

<IF COND="IsVariable.tid=true">
<THEN>
    <RENDER.LOGDEP    cid="Variables.tid" c="Template"/>
</THEN>
</IF>
```

The following ASSET.LOAD tag loads the HelloCollectionHello asset, based upon the value of its ID, contained in Variables.cid. Variables.cid is passed in by the HelloPage template. ASSET.LOAD also names the asset HelloCollection. This does not change the name of the asset in the database; rather it sets the name which the rest of the code in the template uses to refer to the collection asset.

```
<ASSET.LOAD NAME="HelloCollection" TYPE="Collection"
OBJECTID="Variables.cid"/>
<ASSET.SCATTER NAME="HelloCollection" PREFIX="asset"/>
```

Then the following ASSET.CHILDREN tag loads a list containing the HelloArticles that compose the collection.

```
<ASSET.CHILDREN NAME="HelloCollection" LIST="theArticles"
OBJECTTYPE="HelloArticle"/>
```

The next line uses the RENDER.FILTER tag to filter out articles that are not approved for Export to Disk Publishing. This allows the template to be used for both Mirror Publishing and Export to Disk Publishing.

```

<!--Filter out assets which aren't approved for export to disk
publishing.-->
<RENDER.FILTER LIST="theArticles"
LISTVARNAME="ApprovedArticles" LISTIDCOL="oid"/>

```

In the following lines of code, the `LOOP` tag loops through the list of approved article and the `RENDER.LOGDEP` tag logs each item in the list as a cache dependency.

```

6  <LOOP LIST="ApprovedArticles">
7  <RENDER.LOGDEP cid="ApprovedArticles.id" c="Article"/>

```

The following lines use an `IF` tag to check whether the current article in the list is the article being displayed by the `HelloArticle` template. The ID of the article being displayed by the `HelloArticle` template is contained in `Variables.artID`. This variable is passed in by the `HelloPage` template. If the article IDs are the same, the name of the article is displayed in bold text and is not a hyperlink.

```

<IF COND="Variables.artID=ApprovedArticles.id">
<THEN>
<B><CSVAR NAME="ApprovedArticles.name" /></B><P/>
</THEN>

```

If the current article in the list is not the article being displayed by the `HelloArticle` template, then a URL is generated to create a hyperlink to that article. The URL is created by the `RENDER.GETPAGEURL` tag in the following lines. `RENDER.GETPAGEURL` appends the `artID` variable to the URL that it creates. This variable contains the ID of the article to display.

```

<ELSE>
<RENDER.GETPAGEURL PAGENAME="HelloAssetWorld/Page/
HelloPageTemplate"
cid="Variables.pageID"
c="Page"
p="Variables.p"
OUTSTR="referURL"
ARGS_artID="ApprovedArticles.id"/>

```

These lines display the hyperlink. The `REPLACEALL` argument evaluates `Variables.referURL`, which contains the URL for the hyperlink. The `CSVAR` tag, used on line 38, displays the name of the article that the hyperlink links to.

```

<A HREF="Variables.referURL" REPLACEALL="Variables.referURL">
<CSVAR NAME="ApprovedArticles.name" />
</A><P/>
</ELSE>
</IF>

</LOOP>
<satellite.tag type="close"/>

</FTCS>

```

## The HelloPage Template

The HelloPage template acts as a containing page. It renders the HelloPage asset, displays a header graphic, and calls the HelloCollection and HelloArticle templates, creating the finished page layout.

The HelloPage template uses the following variables:

Variable	Value	Source
tid	The current template's ID.	The tid variable is set in the resargs1 field of the SiteCatalog table. The value is set automatically when the template is created.
c	The type of content that the template displays.	The c variable is set in the resargs1 field of the SiteCatalog table. The value is set using the Asset Type field on the New Template form.
cid	The ID of the asset to load.	The cid variable is set in the resargs1 field of the template's SiteCatalog entry.
topImg:ID	The ID of the TopImage ImageFile asset.	The topImg:ID variable is obtained by scattering the information in the TopImage image file asset.
topImg:alttext	The alternate text for the TopImage asset.	The topImg:alttext variable is obtained by scattering the information in the TopImage image file asset.
topImg:mimetype	The mimetype of the TopImage asset	The topImg:mimetype variable is obtained by scattering the information in the TopImage image file asset.
asset:ID	The ID of the Page asset that this template renders.	The asset:ID variable is obtained by scattering the information in the HelloPage asset.
theCollection.oid	The ID of the HelloCollectionHello collection, to be passed to the HelloCollection template for display.	The collection, and hence its ID, are associated with the Page asset.
artID	The ID of the article to display in the HelloArticle template.	On the first page view, this is set in the resdetails field of the ElementCatalog entry. On subsequent viewings, this is passed in by the HelloCollection template.



The code for the HelloPage template follows, along with a description of what it does:

```
<satellite.tag type="open"/>

<IF COND="IsVariable.tid=true">
<THEN>
    <RENDER.LOGDEP cid="Variables.tid" c="Template"/>
</THEN>
</IF>

<!--Table for formatting-->
<table border="1" cellpadding="5" cellspacing="5">

<tr>
<td colspan="2">
```

These lines load a HelloImage asset and display that asset using the RENDER.SATELLITEBLOB tag.

```
<!--Embedded Image Asset-->

<!-- The following 2 lines line load the image file and scatter
the information in its fields. -->
<ASSET.LOAD NAME="TopImage" TYPE="HelloImage"
OBJECTID="1024605735822"/>
<ASSET.SCATTER NAME="TopImage" PREFIX="topImg"/>

<!-- This line creates a URL to display the image file.-->
<RENDER.SATELLITEBLOB BLOBTABLE="HelloImage" BLOBKEY="id"
BLOBCOL="urlfile" BLOBWHERE="Variables.topImg:id"
BLOBHEADER="Variables.topImg:mimetype" SERVICE="IMG SRC"
ARGS_alt="Variables.topImg:alttext" ARGS_WIDTH="600"
ARGS_HEIGHT="90"/>
</td>
</tr>

<tr>
<td>
```

Next, the code loads the HelloPage asset based on the value of Variables.cid, which is set in the resargs1 field of the template's SiteCatalog entry.

```
<!-- This loads the HelloPage asset and names it HelloPage. -->
<ASSET.LOAD NAME="HelloPage" TYPE="Variables.c"
OBJECTID="Variables.cid"/>

<!-- This scatters the fields of the HelloPage asset for use
later in the element. -->
<ASSET.SCATTER NAME="HelloPage" PREFIX="asset"/>
```

```

<!-- This finds the collection asset associated with the
HelloPage asset and puts the information the collection into a
list. -->
<ASSET.CHILDREN NAME="HelloPage" LIST="theCollection" />
<RENDER.LOGDEP C="Collection" CID="theCollection.oid"/>
<!-- This checks to see whether ASSET.CHILDREN really generated
a list. -->
<IF COND = "IsList.theCollection=true">

    <THEN>
        <!-- This displays the HelloCollectionTemplate
template and passes the template the ID of the collection to
display and the ID of the current page. -->
        <RENDER.SATELLITEPAGE PAGENAME="HelloAssetWorld/
Collection/HelloCollectionTemplate"
ARGS_cid="theCollection.oid" ARGS_p="Variables.asset:id"
ARGS_artID="Variables.artID"/>
    </THEN>

</IF>
</td>

<td>
<!-- This displays the HelloArticleTemplate template and passes
the template the ID of the article to display and the ID of the
current page. The artID variable is passed in by the URL.-->
<RENDER.SATELLITEPAGE PAGENAME="HelloAssetWorld/HelloArticle/
HelloArticleTemplate" ARGS_cid="Variables.artID"
ARGS_p="Variables.asset:ID"/>
</td>
</tr>
</table>

<satellite.tag type="close"/>

</FTCS>

```

## The HelloQuery Asset

The HelloAssetWorld site uses a query asset named HelloQuery to retrieve HelloArticles from the database. A content provider then creates and builds a collection, ranking the items that the HelloQuery asset returns in the order that they will be displayed.

## Chapter 26

# The Portal Sample Site

The Content Server portal sample site is an example of a site built with Content Server alone—without using any of the CSEE content applications.

This chapter describes the portal sample site. It contains the following sections:

- Portal Overview
- Caching Strategy
- Portal Elements
- The CacheManager Samples

## Portal Overview

Content Server includes three different versions of the portal sample:

- A portal sample written in XML.
- A portal sample written in JSP.
- A static version design for export.

The XML and JSP versions are optimized for Content Server with or without CS-Satellite, and both include a small amount of Java code.

The portal sample also contains a section of sample CacheManager elements.

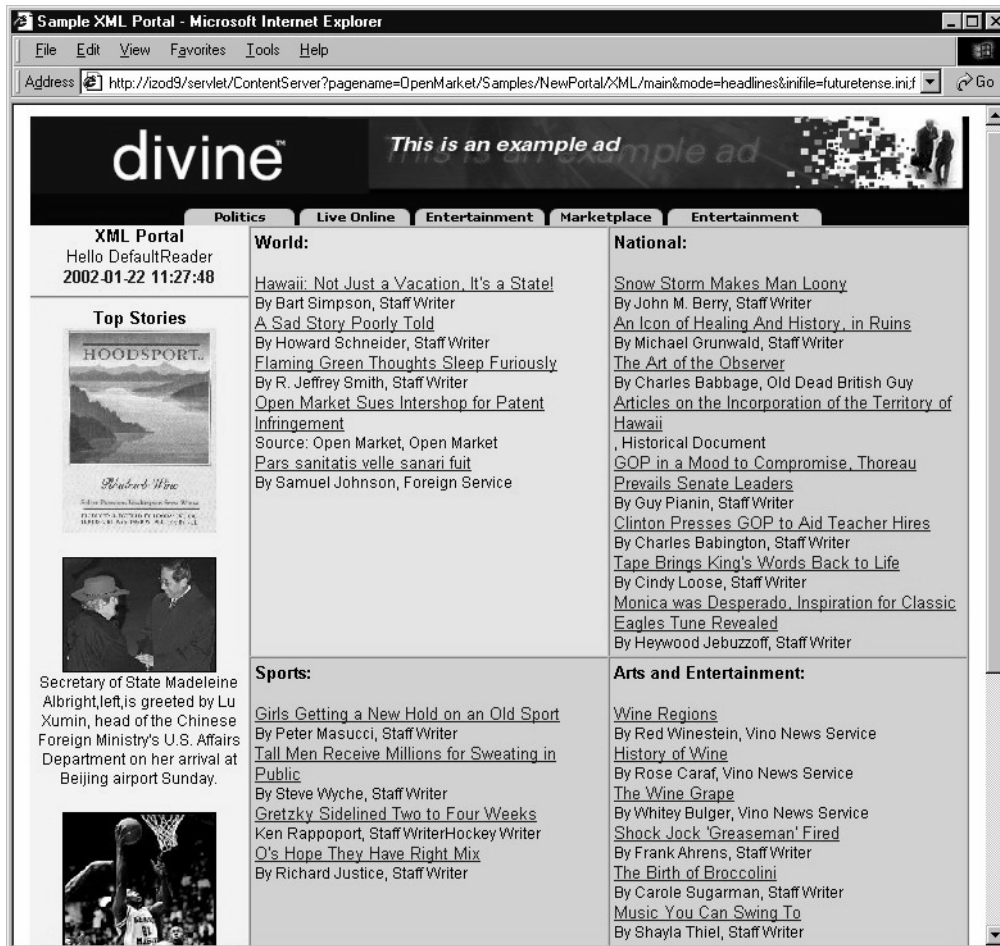
This chapter details the XML version of the portal sample site and the sample CacheManager elements. The XML, JSP, and static versions of the sample site demonstrate how to code an online news portal. The elements—whether in XML or in JSP—define the format. The content consists of short articles and images.

### Note

The portal sample site is designed specifically for use with Content Server without CS-Direct. There is no provision for CS-Direct site management and asset support.

Visitors to the portal web site first see the main page, which contains a logo, advertisements, a navigation bar, and the headlines of many articles. Each headline is a hyperlink to the full article. Clicking one of these headlines takes the visitor to the corresponding article page.

The main page, or **containing page**, made up of distinct rectangular sections called **pagelets** (or bricks), is laid out as a table, where each pagelet is a cell in the table. The following figure illustrates the main page:



The article page is similar to the main page but has a pagelet featuring the content of a single article selected by the visitor instead of four separate bricks containing multiple headlines. The following figure illustrates the article page:



## Portal Namespace

A **namespace** is the name that uniquely identifies elements and queries in the SiteCatalog, ElementCatalog, and SystemSQL tables. A CSEE namespace is a path; for example, OpenMarket/Samples. The namespace uniquely identifies a related set of pages, queries, and other structural information that is contained in the CSEE database.

The portal sample uses the following namespace:

OpenMarket/Samples/NewPortal

The versions of the portal sample have the following namespaces:

- OpenMarket/Samples/NewPortal/XML
- OpenMarket/Samples/NewPortal/JSP
- OpenMarket/Samples/NewPortal/Export
- OpenMarket/Samples/NewPortal/CacheManager

## Caching Strategy

Each pagelet in the portal sample site is evaluated by the developer as a candidate for page caching based on the following criteria:

- **Timeliness** – Does the pagelet content need to be updated more or less frequently than other pagelets?
- **Reuse** – Is the pagelet re-used between pages?
- **Inputs** – What variables or session variables are needed to display the contents of the pagelet?
- **Security** – Is secure access to the pagelet or content required?
- **Frequency** – How frequently is the pagelet requested?

Navigation bars, headers, and footers are usually reused across pages and are created as individual pagelets. A part of the front page that is customized for every visitor (like a specific article) may also be a cached pagelet—not because it is reused, but because it requires computation and may be requested frequently while the visitor browses the pages.

If there is an element that does not by itself display page contents to the visitor but instead performs business logic that may eventually result in a page display, then that element probably should not be cached since the results of the business logic may change frequently, even for the same visitor within a single session.

The portal sample uses a random number generator to determine which advertisements to display in the header and footer. In these cases, the ad pagelets themselves are cached to speed up the time it takes to display them again. The trade-off is that the site visitor sees the same ad images throughout the session, or until the time-out is reached.

Of course, on a real-world web site, you may not use this technique to generate random ads. Some ad servers automatically serve different ads to a site visitor within the same session.

## Portal Elements

The portal includes eight pagelet elements, summarized in the following table:

Pagelet Element	What It Does
AdBrick	Displays a random ad
ArticleBrick	Displays an article and its accompanying image
CompanyLogoBrick	Displays the company logo
FooterBrick	Displays footer info
Greeting	Displays a personalized greeting to the visitor
ImagesBrick	Displays some images with captions
Main	Defines the format; invokes other pagelets
NavBrick	Displays a navigation bar

Pagelet Element	What It Does
NewsBrick	Displays a list of articles

## The main.xml Element

The `main.xml` element creates both the main page format and the article page format. A branching statement (described in “Calling the ArticleBrick and NewsBrick Elements” on page 584) determines which page format is displayed.

The `main.xml` element defines an HTML table. Each section of the main page, or each pagelet element, determines the contents of a cell in that table.

The `main.xml` element starts with the standard Content Server XML header:

```
<?XML VERSION="1.0" ?>
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- OpenMarket/Samples/NewPortal/main
--
-- INPUT
--   mode = "headlines" or "article"
--
-- OUTPUT
--
-->
```

## satellite.tag

Immediately after the standard XML header is the `<satellite.tag>` tag:

```
<satellite.tag type="open"/>
```

This tells Content Server that the element contains at least one `satellite.page`, `satellite.blob`, `satellite.link`, or `satellite.cookie` tag, and that the element requires parsing by CS-Satellite. The element closes with the following tags:

```
<satellite.tag type="close"/>
</FTCS>
```

The `satellite.tag` tags are required if an element contains either `satellite.page`, `satellite.blob`, `satellite.link`, or `satellite.cookie`.

## Calling the Pagelet Elements

The following lines call the `CompanyLogoBrick` pagelet:

```
<satellite.page
  pagename="OpenMarket/Samples/NewPortal/XML/CompanyLogoBrick"
  cachecontrol="CS.Property.page.time"/>
```

The `satellite.page` tag tells Content Server to retrieve the specified page (or pagelet) from the CS-Satellite cache. If the pagelet has not been cached, Content Server caches the pagelet in the CS-Satellite page cache for the time-out period specified by `cachecontrol`. If CS-Satellite is not installed, then Content Server retrieves (and caches, if necessary) the pagelet according the parameter set in the element's `cacheinfo` column.

`CS.Property.page.time` sets the `cachecontrol` parameter to the value you specified for the `property.page.time` in the `futuretense.ini` file.

The calls in `main.xml` to all other pagelets elements work exactly the same way—use the `satellite.page` tag to retrieve a cached pagelet, or add it to cache if it is uncached. (To simplify the portal example, all `satellite.tag` calls use the same value for `cachecontrol`. In a real situation, these time-out values would be different.)

## Calling the ArticleBrick and NewsBrick Elements

The portal web site can display two different kinds of pages:

- The main page
- An article page

The difference between the main page and an article page is one pagelet, which displays either a list of headlines (the main page) or a single article chosen by the site visitor (an article page). The value of `Variables.mode` determines whether the main page or an article page is displayed—a value of “headlines” calls the `mainheadlines` element, and a value of “article” calls the `mainarticle` element.

If `main.xml` calls `mainarticle`, it also includes an article ID parameter. Because at this point there is no clear pagelet to cache, the `CALLELEMENT` tag is used instead of the `satellite.page` tag:

```
<CALLELEMENT
  NAME="OpenMarket/Samples/NewPortal/XML/mainVariables.mode">
  <ARGUMENT NAME="articleid" VALUE="Variables.articleid"/>
</CALLELEMENT>
```

In addition, the `mainarticle.xml` and `mainheadlines.xml` elements each contain another `satellite.page` tag to control caching.

## Populating the Content

The main element creates the format, but relies on other elements to populate the contents. Each of the other elements is responsible for populating one section of the main page. For example, the `AdBrick` element is responsible for getting and displaying an advertisement.

The content consists of images and articles. To keep this content organized, the web site relies on the following two database tables:

Table	What It Contains
NewPortalArticle	A description of each of the articles in this site. Each row details one article. The columns in this extensive table describe different attributes of each article, such as the byline, the headline, and a short synopsis.
NewPortalImage	A description of each of the images in this site. Each row details one image. The columns in this table describe different attributes of each image, such as the artist, the caption, the width, and height.
NewPortalStyleSheet	The portal stylesheet file ( <code>all.css</code> )



Some of the XML elements (`ArticleBrick` and `ImageBrick`) perform database lookups to query the tables for information.

## The Other Elements

This section lists the source XML for each of the other seven elements.

### CompanyLogoBrick Element

The `CompanyLogoBrick` element retrieves the company logo from the `NewPortalImage` table. The company logo is the only entry in this table whose `category` field is equal to `logo`.

### AdBrick Element

The `AdBrick` element picks and displays a random advertisement. does not include a random number tag, so the portal relies on a custom Java tag named `portal.randomval` to pick a random integer between 1 and 10, inclusive (because there are exactly 10 advertisements in the `NewPortalImage` table). A real application would need to determine the number of available advertisements and pick the random number over the appropriate range.

The `NewPortalImage` table uses the `id` fields as its primary key. The `id` of each advertisement is an integer between 1 and 10. For example, if the random number generator (`portal.randomval`) returns the number 3, then the database query looks for the row whose `id` is 3. The returned row contains several fields identifying features such as the advertisement's filename and the ALT text. An `IMG` tag displays the chosen advertisement.

### NavBrick Element

The `NavBrick` element queries the `NewPortalImage` table for the image whose `category` field is set to `tabs`. The element then displays the retrieved image, which is a navigational aid. The same navigation bar appears in all pages.

### ImagesBrick Element

The `ImagesBrick` element queries the database for three images, and then displays those three images in the middle-left part of the page. The main element passes in values for `panewidth`, `numimages`, and `criteria` as arguments to the `ImagesBrick` element.

### ArticleBrick Element

The `ArticleBrick` element queries the `NewPortalArticle` table for the row having a particular `articleid`. Upon locating the correct row, `ArticleBrick` displays various information from the row, including the headline, byline, and the entire contents of the article. Note that the contents of the article are stored as a separate file. The `ArticleBrick.xml` element uses the `CSVAR` tag and the indirection symbol (an `@` sign) to print the contents of the chosen article.

### NewsBrick Element

The `NewsBrick` element queries the `NewPortalArticle` table for five rows that meet a certain criteria. The main element passes this criteria as an input argument to `NewsBrick`. Then, `NewsBrick` displays the headlines for the selected articles. The headlines are hyperlinks to the full-length version of the article.

## FooterBrick Element

The `FooterBrick` element contains all hard-coded hyperlinks. It performs no database lookups.

## The CacheManager Samples

The `CacheManager` sample elements demonstrate how to use the `CacheManager` Java methods to automatically flush and update your Content Server and Satellite Server caches as content is added or altered on your web site.

If you are running a system with CS-Direct, `CacheManager` tracks content changes and updates your caches automatically, with no coding necessary on your part. If, however, you are running a Content Server-only system, you will need to code your own cache management elements, using the following samples as a guide.

### Logging Cache Dependencies

The first step in using `CacheManager` to maintain your caches is to log content as a cache dependency, if that content will change. The portal sample contains a custom tag, `portal:logdep`, which logs dependencies to the cache tracking tables. You can also log cache dependencies in Java by using `CacheManager`'s `RecordItem` method.

The `ArticleBrick.jsp` element uses the `portal:logdep` tag to log the article as a cache dependency, as shown in the following code excerpt:

```
<!-- get the article from the database -->
<ics:setvar name='id' value='<%=ics.GetVar("articleid")%>' />
<ics:selectto listname='articlelist' table='NewPortalArticle'
where='id' limit='1' what='*' />
<!--log article in the cache tracking tables-->
<portal:logdep>
  <portal:parameter name='id' value='<%=ics.GetVar("id")%>' />
</portal:logdep>
```

### Logging Into the CacheManager Sample

The first two `CacheManager` elements constitute a simple log in mechanism. `Login.xml` is a basic form that accepts a username and password. This information is passed on to the `loginPost.xml` page, which processes the login.

If the username and password are valid, the `loginPost` page displays the contents of the `menu.xml` element, which allows users to access various functions, depending upon the ACL that they belong to.

### Editing An Article

If users belong to the `ContentEditor` ACL, they can edit articles by clicking on the "Edit An Article" link in `menu.xml`. The link takes them to the `editArticle.xml` page, a simple form which allows users to choose the ID of the article they want to edit. Submitting this form takes users to the `editArticleForm.xml` form, which allows users to input changes to the chosen article's headline and body fields.

The actual updating of the article, and the subsequent cache maintenance steps are performed by the `editArticlePost.jsp` element. `editArticlePost` is written in JSP to allow use of the `CacheManager` Java methods.

An excerpt from the `editArticlePost` element follows:

```
1  <cs:ftcs>
2  <!-- user code here -->
```

Lines 4 through 14 use the `satellite:blob` tag to serve a style sheet via `BlobServer`. The value of the `cachecontrol` parameter, which controls how long the blob stays in the CS-Satellite cache, is contained in the user-defined property `image.time`. Note that the `cachecontrol` parameter does not affect the Content Server timeout for blobs; blob timeout on Content Server is controlled by the `bs.bCacheTimeout` property, found in the `futuretense.ini` file.

```
3  <satellite:blob>
4  <satellite:parameter name='service' value='link href' />
5  <satellite:parameter name='rel' value='stylesheet' />
6  <satellite:parameter name='type' value='text/css' />
7  <satellite:parameter name='blobtable'
   value='NewPortalStyleSheet' />
8  <satellite:parameter name='blobkey' value='id' />
9  <satellite:parameter name='blobwhere' value='all' />
10 <satellite:parameter name='blobcol' value='url' />
11 <satellite:parameter name='blobheader' value='text/css' />
12 <satellite:parameter name='cachecontrol'
   value='<%=ics.GetProperty("image.time")%>' />
13 </satellite:blob>
```

Lines 22 through 47 use `CatalogManager` to add the updated headline and body text to the database, then check for errors.

```
14 <P class="articleHeadline">Saving article</P>
15
16 <%
17 // should we even bother to go on to the next step?
18 boolean bProceed = true;
19
20 String id = ics.GetVar("id");
21
22 FTValList args = new FTValList();
23 args.setValString("ftcmd","updaterow");
24 args.setValString("tablename","NewPortalArticle");
25 args.setValString("id",id);
26 args.setValString("headline",ics.GetVar("headline"));
27 args.setValString("urlbody",ics.GetVar("urlbody"));
28
29 // add the row
30 ics.CatalogManager(args);
31 if (ics.GetErrno() < 0)
32 {
33 %><P class="articleBody">ERROR Saving Article!!!!
   errno=<%=ics.GetErrno()%></P><%
34 bProceed = false;
35 }
```

```

36 else
37 {
38 %><P class="articleBody">Success</P><%
39 }
40
41 %>
42
43
44
45 <ics:if condition='<%=bProceed%>'>
46 <ics:then>

```

If the database update has gone smoothly, the process of deleting outdated pages from the cache begins. Lines 50 creates a new `CacheManager` object. Line 51 creates an array containing the ID of the outdated page to pass to `CacheManager`'s `setPagesByID` method, used in line 52. `setPagesByID` creates a list of pages that have altered and will be deleted, based on the IDs you supply.

```

47 <P class="articleHeadline">Getting list of pages that are
   now invalid</P>
48
49 <%
50 COM.FutureTense.Cache.CacheManager cm = new
   COM.FutureTense.Cache.CacheManager(ics);
51 String [] changedItems = {id};
52 int numpages = cm.setPagesByID(ics,changedItems);
53
54 %>
55
56 <P class="articleBody"><%=numpages%> invalid pages found in
   cache</P>
57
58
59 <ics:if condition='<%= (numpages > 0) %>'>
60 <ics:then>
61
62 <P class="articleHeadline">Refreshing stale data on CS-
   Satellite engines (if configured)</P>

```

Line 65 uses the `refreshSSEngines` method to insure that the content on the CS-Satellite installations is current. As the updated content is not yet in the Content Server and CS-Satellite caches, visitors to the website will see the un-edited version of the article you changed until the caches are updated and the cache management process is complete.

```

63 <%
64 ftStatusCode result = null;
65 result = cm.refreshSSEngines(ics);
66
67 // display the results
68 %>
69 <%=dumpStatusCodes(result)%>
70
71

```

```

72 <P class="articleHeadline">Flushing invalid cached page
    from CS engine generated for CS</P>
73 <%
74 result = null;

```

Lines 75 and 85 use the `flushCSEngine` method to flush pages created for Content Server and CS-Satellite from the Content Server cache.

```

75 result =
    cm.flushCSEngine(ics,COM.FutureTense.Cache.CacheHelper._cs)
    ;
76
77 // display the results
78 %>
79 <%=dumpStatusCodes(result)%>
80
81
82 <P class="articleHeadline">Flushing invalid cached page
    from CS engine generated for SS</P>
83 <%
84 result = null;
85 result =
    cm.flushCSEngine(ics,COM.FutureTense.Cache.CacheHelper._ss)
    ;
86
87 // display the results
88 %>
89 <%=dumpStatusCodes(result)%>
90

```

Lines 94 and 103 use the `refreshCSEngine` method to rebuild the Content Server cache with updated pages for Content Server and CS-Satellite.

```

91 <P class="articleHeadline">Regenerating cached page for CS
    engine for pages generated for CS alone</P>
92 <%
93 result = null;
94 result =
    cm.refreshCSEngine(ics,COM.FutureTense.Cache.CacheHelper._cs);
95
96 // display the results
97 %>
98 <%=dumpStatusCodes(result)%>
99
100 <P class="articleHeadline">Regenerating cached page for CS
    engine for pages generated for Satellite engines</P>
101 <%
102 result = null;
103 result =
    cm.refreshCSEngine(ics,COM.FutureTense.Cache.CacheHelper._ss);
104
105 // display the results
106 %>

```

```

107 <%=dumpStatusCodes(result)%>
108

```

Line 113 deletes the outdated content from the CS-Satellite caches using the `flushSSEngines` method. This allows visitors to the website to view the updated article, which is then stored in the CS-Satellite caches.

```

109 <P class="articleHeadline">Flushing cached page from SS
    engines to reveal new content (if configured)</P>
110
111 <%
112 result = null;
113 result = cm.flushSSEngines(ics);
114
115 // display the results
116 %>
117 <%=dumpStatusCodes(result)%>
118
119 </ics:then>
120 </ics:if>
121
122
123 </ics:then>
124 </ics:if>

```

## Viewing the Contents of the Cache

In addition to using the `CacheManager` object to maintain your caches, you can use `CacheManager` to view the contents of the Content Server and CS-Satellite caches, as shown in the following sample code:

```

1  <%
2
3  // create the cache manager
4  CacheManager cm = new CacheManager(ics);
5
6  %>
7
8  <P class="articleHeadline">Content Server Cache</P>

```

Line 9 uses the `getCSInventory` method to display the contents of the Content Server cache. Note that the format of the data that this method returns can vary, therefore you should not write code that is dependant upon a specific format.

```

9  <div
    class="articleBody"><%=cm.getCSInventory(ics,CacheHelper.sB
    asic)%></div>
10
11
12 <P class="articleHeadline">Satellite Cache</P>

```

Line 13 uses the `getSSInventory` method to get an array containing the contents of the CS-Satellite cache. As with the `getCSInventory` method, the format of the data that this method returns can vary, therefore you should not write code that is dependant upon a specific format.

Lines 15 through 28 loop through this array to display the contents of each CS-Satellite installation's cache.

```
13 <%
14 String [] inventory =
    cm.getSSInventory(ics,CacheHelper.sNames);
15 int numServers = inventory.length;
16
17 int curServer = 0;
18 while (curServer<numServers)
19 {
20 // dump the contents of each server!
21 %>
22 <div class="articleBody"><%=inventory[curServer]%%></div>
23 <hr>
24 <%
25 curServer++;
26 }
27
28 %>
```





## Chapter 27

# The Burlington Financial Sample Site

The Burlington Financial sample site demonstrates site design best practices using CS-Direct assets.

Content management can be highly abstract, especially when described in terms of assets, queries and templates. Burlington Financial helps you to understand what the end result of your application can be—a live, functioning web site. Developers and content managers have immediate and easy access to the sample site's code and queries.

This chapter contains the following sections:

- Overview
- Navigation Features
- Best Practices

## Overview

Burlington Financial is a fictitious financial news portal. The site emphasizes navigation between sections, the site's hierarchy, how the site works with CS-Direct and CS-Direct Advantage asset types, and a real-world look-and-feel. Burlington Financial also has about five hundred articles and over a hundred images, or enough real-world content to populate several sections.

Burlington Financial is a fully functional sample site with the following features:

- Includes search, member login, printer-friendly articles, e-mail to a friend, topic directory, and stylesheets
- Demonstrates a hierarchy of web site sections
- Supports component caching and CS-Satellite
- Demonstrates the use of assets created with AssetMaker
- Demonstrates the use of CS-Direct Advantage Flex Assets and CS-Engage Segment Assets
- Includes a meaningful amount of content
- Approximates a real-world site that developers can learn from

The Burlington Financial home page is shown in the following figure:



Burlington Financial takes advantage of cacheable pagelets. These individual pagelets can be cached and managed independently, giving developers greater performance and flexibility on the site.

FatWire™ encourages you to design your site using cacheable pagelets. For more information, see Chapter 4, “Page Design and Caching.”

## Navigation Features

The following three elements are used to display the primary navigation bars in Burlington Financial (which you can look at using Content Server Explorer):

### BurlingtonFinancial/Site/TopSiteBar.xml



This element draws the hyperlinks to the home page and its top-level children at the top of the page, just under the Burlington Financial logo.

It intentionally displays only the top-level children of the Home page, so that the row of hyperlinks does not wrap, breaking the design of the page. The Home page appears first and it is at the same level as its children.

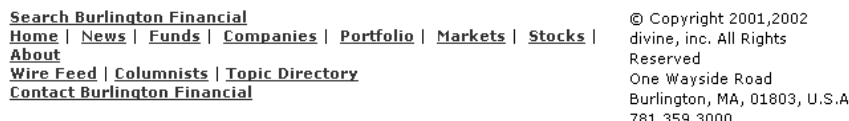
### BurlingtonFinancial/Site/LeftSideSiteBar.xml



This element draws a more detailed map of the major sections of the web site and looks at the child and grandchild pages of the Home page. This element could be modified to go more than two levels deep, although the graphic design of the site limited the space available.

Notice that two other major pages are listed here that were not listed in the TopSiteBar—the Wire Feed and Columnists pages are independent of the Home page and its children, and are displayed separately.

### BurlingtonFinancial/Site/BottomNavFooter.xml



This element draws the hyperlinks at the bottom of every page. Like LeftSideSiteBar, the BottomNavFooter element also includes links to pages that are not children of the Home page.

**Note**

If you add another Page asset to the site, and it is not a descendant of the Home Page asset, then it will not automatically appear in any of the navigation bars used in Burlington Financial.

Although these navigation bars are computed dynamically, in a real-world web site they would probably not change very often. For maximum performance, you could simply replace the dynamic code in the element with a static list of hard-coded links to the top-level pages. Later on, if you do need to change the site and add a new top-level section, you need only modify a few elements.

If you use dynamic navigation bar elements, you should set a long cache time-out for the navigation bar pagelets.

**Breadcrumbs**

This common feature in web sites is a tiny map of the path to a particular item. In Burlington Financial, it is a conceptual path rather than the actual history of pages visited, and is located just under the top navigation bar:

[Home](#) ▶ [Markets](#) ▶ [World Markets](#) ▶ [Kuala Lumpur Stocks Close Lower](#)

Because CS-Direct allows assets to be assigned to multiple parents at the same time, the same article can appear as a member of a collection on the Home page and on the News page at the same time. There is no way to identify the true parent of the article, so Burlington Financial passes the `id` of the parent Page anytime it draws a hyperlink to a child. That way, when the child asset draws itself, it already has the ID of the desired parent. This value is passed in the variable `p`.

Since our templates generate different HTML based on different values for `p`, those versions should be cached independently. So the variable `p` must be part of the page criteria variables listed in the page entry in the `SiteCatalog` for that template. Because this is such a common technique, CS-Direct automatically includes `p` in the list of page criteria variables for a template asset's `SiteCatalog` page entry.

Sometimes you may want to override `p` and use a different parent asset. For example, the Burlington Financial Home page has links to articles by the following columnists:



**Where did the shoppers go?**  
A Consumer Spending Slowdown  
Rattles Retailers  
By Mark Williams | Mar 27, 2001



**Janus Fund looks ahead**  
Despite String of Bad News, Janus  
Still Good for Long Haul  
Sharon Jacobson | Mar 27, 2001



**A quiet victory for the small investor**  
Small Investors to Get Equal  
Access to Company Information  
Steve Anderhess | Mar 27, 2001

However, these articles don't belong conceptually to the Home page—rather, they belong to the Columnists page. So you can load and pass the ID of the Columnists Page asset as the parent for those hyperlinks. This way, when a visitor clicks on them, the breadcrumb identifies Columnists as the parent. This behavior is consistent with clicking on the Columnists link in the navigation bar, and then clicking on one of the articles there:

[Columnists](#) ▶ Where did the shoppers go?

In other cases, it isn't immediately clear which asset should be the parent. For example, Burlington Financial treats the articles in the "From the Wires" box as belonging to the current page. Stories listed on the main "Wire Feed" section page belong to the "Wire Feed" section, and show Wire Feed as their parent.

## Best Practices

The Burlington Financial sample site demonstrates CSEE best practices for several other important features found in real-world web sites.

### Searching

The database search code in Burlington Financial is very similar to the search code in the CS-Direct application itself. It works with dynamic delivery, but not with exported static HTML. In this case, you'll need a different search mechanism for indexing the static HTML files, for example the AltaVista search engine.

The `BurlingtonFinancial/Util/SearchPost` element uses SQL searching against the Article table, or it can use the search engine index if it is installed and enabled for the Article asset type. SQL searching is case sensitive. Using a search engine would allow more sophisticated search capabilities, such as case-insensitive searching, word variants and word stemming.

### Keywords

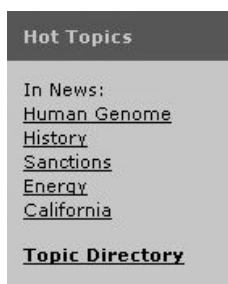
The Article asset type contains a field called **keyword** which lets editors associate specific terms with an Article for improved searching of the Article asset type. Burlington Financial Article assets have one or more keywords separated by commas, for example, "Energy, Shell Oil, OPEC." Burlington Financial uses keywords to display lists of Hot Topics.

### Hot Topics

Burlington Financial Hot Topics demonstrate one use of query assets.

On the left side of most pages, there is a list of Hot Topics for a particular section of the site. Hot topics are listed according to which section the visitor is viewing, as determined by the Page assets.

In the following example, the Hot Topics in the News section are Human Genome, History, Sanctions, Energy and California:



The element `BurlingtonFinancial/Common/LeftNavColumn` includes the pagelet `BurlingtonFinancial/Query/ShowHotTopics`. This element receives the ID of a page asset, passed through the variable `p`. If it cannot find a value for `p`, it defaults to using the Home page. It loads that page asset and looks for the top stories collection associated with the page and loads it. The element then loops through each of the articles in the collection and builds a list of keywords, pulled from the keyword field of the article (multiple keywords for an article must be delimited by commas). After it has made a list of the keywords, the element loops over that list, listing each keyword as a hyperlink to a page that runs a query for that keyword, by rendering the query asset named `HotTopics`.

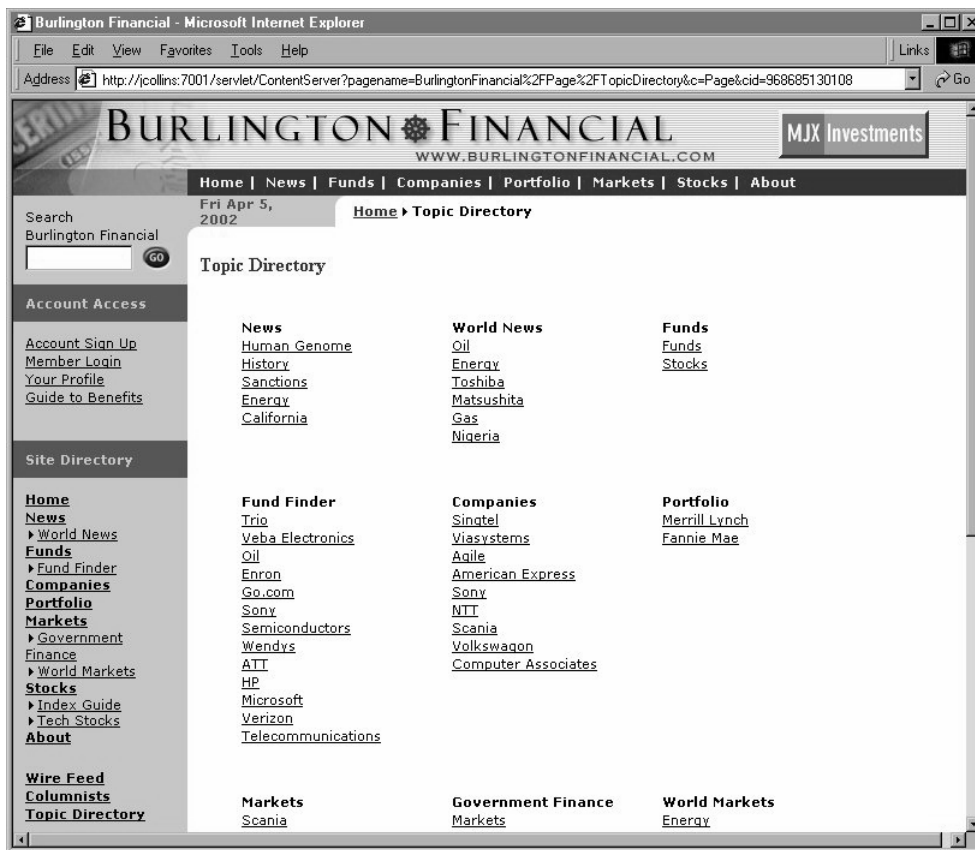
When visitors click a link, they are taken to a page that renders the query asset `HotTopics`, using the `HotTopicFront` template. The `HotTopics` query does a straight SQL match against articles that contain the selected keyword. The keyword search is not constrained in any way—it searches all articles in the Burlington Financial site, not just those in a particular section or category.

Each article returned by the `HotTopics` query inherits the parent ID of the page asset where the visitor first started looking at the keywords. Clicking on the Shell Oil story from the list of Energy stories under the News page causes the story to be displayed with News as its parent page. Clicking on the same Shell Oil story from the list of Energy stories under the World News page causes the story to be displayed with World News as its parent.

This design is not a problem in the dynamic live site; however it does cause duplicate files to be exported to a static delivery site.

## Topic Directory

At the bottom of the left navigation column, and also in the navigation links at the bottom of each page, there is a hyperlink to the Topic Directory:



This page consists of the Hot Topics pagelet for every section. Since the pagelet that is used here is also used in the left navigation column, it is displayed in the browser very quickly. Each topic inherits its parent page and passes it to the list of articles the query returns.

## Related Stories

The query asset used for an article's Related Stories list is similar to the previously described HotTopics query, but instead of getting the keywords from another page, it gets the keyword from the article that the query is associated to. The Article template "Full" includes the Related Stories pagelet, and passes the Article's first keyword to the query asset. When the Related Stories query is executed, it looks for other articles with the same keyword.

For example, from the Home page, click on the Hot Topic "Microsoft" and choose the story "Microsoft launches worldwide campaign against counterfeit software." This article (cid=984156689788) has the word "Microsoft" in its keyword field. It also has the Related Keyword query associated with it. When this Query is executed during rendering, the SQL looks up five other Articles with the term "Microsoft" in their keyword field. The query is designed to exclude the article that it is associated with, so you don't see the "Microsoft Campaigns Against Counterfeit Software" subheadline in the Related Stories.

In a dynamic environment, the list of articles returned by this query can change as articles are added to the site.

## Text-Only Versions

Creating a text-only version of a web page (for printing it) is very easy to implement with CS-Direct. Using the CS-Direct rendering model, you can override a template that displays a given asset just by changing the page name used to render it. You do not need to pass the override template as a separate parameter. Creating a printer-friendly version of a page is simply a matter of adding a hyperlink that uses the plain-text version of the appropriate template.

For example, if you are pointing to an article:

```
http://myserver/servlet/
ContentServer?pagename=BurlingtonFinancial/Article/
Full&cid=987654321
```

You can change to the text-only version of the page by pointing to the text version of the template:

```
http://myserver/servlet/
ContentServer?pagename=BurlingtonFinancial/Article/
FullText&cid=987654321
```

Burlington Financial uses the convention of adding "Text" to the end of a Template asset name to indicate different styles of templates and elements. Some examples:

- Web format: BurlingtonFinancial/Article/Summary
- Plain text: BurlingtonFinancial/Article/SummaryText
- Web format: BurlingtonFinancial/Page/SectionFront
- Plain text: BurlingtonFinancial/Page/SectionFrontText

## Plain Text Parallel Site

In most web sites, the text-only pages have hyperlinks that take you back to the full web format pages. Or there are simply no navigable links on the printer friendly page. Burlington Financial's templates, though, are designed to show the visitor an entire plain text version of the site.

After you switch to the plain text version, you can continue to navigate around the plain text pages. However, not every single page in the Burlington Financial site is represented in the plain text version of the site. And the plain text pages do not have all the same content or hyperlinks as their graphics-rich versions. This was done intentionally, as a plain-text visitor would probably prefer a less complex version of a site. Extending Burlington Financial to include other parallel styles (WAP templates, WebTV, PDF, XML) would be very straightforward.

## E-mail This Story

Another very common feature on web sites is the ability to e-mail a story. This feature is relatively straightforward in Burlington Financial.

The BurlingtonFinancial/Util/EmailFront and BurlingtonFinancial/Util/EmailPost elements call the article pagelet BurlingtonFinancial/Article/Summary to display the story in summary form. A more robust version of this code would check to make sure that the visitor entered a valid e-mail address before submitting the form. A real site would also keep records of which stories have been e-mailed, the sender's e-mail address, and the recipient's e-mail address.



## AssetMaker Asset Types

AssetMaker is a CS-Direct utility for constructing basic asset types. Two sample AssetMaker asset types are included in Burlington Financial: ImageFile and Stylesheet. These asset types use standard elements from AssetMaker without modification. Both have file upload fields for storing files in the database.

Burlington Financial includes JavaScript at the top of every page to do client-side browser detection and then load one of four corresponding Stylesheet assets. The element `BurlingtonFinancial/Common/SetHTMLHeader`, called at the top of each full-page template, uses the CS-Direct element `GetBlobURL` to get four different BlobServer URLs, one for each of the four different Stylesheet assets used by Burlington Financial. The actual `.css` file from the Stylesheet asset is served via the BlobServer, even though it isn't binary data.

## Mimetype

Both the imagefile and stylesheet asset types are served to the browser using the BlobServer servlet. To ensure that the browser knows how to handle arbitrary chunks of content, a mimetype code is saved and passed to the browser. CS-Direct includes a Mimetype table for storing these codes.

The AssetMaker also allows asset types to define their own mimetype fields. Both the ImageFile and Stylesheet asset types include mimetype fields as part of their asset descriptor files. You can add your own mimetype codes and extensions to the Mimetype table using Content Server Explorer or some other database tool.

## Collections of Collections

The collection asset type is how CS-Direct arranges content into manageable groups. Burlington Financial also demonstrates the use of a collection whose child asset type is a collection. This allows editors to easily rearrange groups of content on a web page simply by re-ranking a collection. These sub-collections can be used to build a library of favorite stories, breaking news, hot topics, etc.

In Burlington Financial, a named asset association called "HomeStoryGroups" was created from the page asset type to the collection asset type. The page template `SectionFront` looks for a collection in the StoryGroups slot. It forces the collection to be displayed using the `BurlingtonFinancial/Collection/StoryGroups` template:

```
<ASSET.CHILDREN NAME="SectionFrontPage" LIST="StoryGroups"
CODE="HomeStoryGroups" /
<IF COND="IsList.StoryGroups=true"
<THEN
<RENDER.SATELLITEPAGE PAGENAME="BurlingtonFinancial/Collection/
StoryGroups"
      ARGS_cid="StoryGroups.oid"
      ARGS_p="Variables.asset:id" /
</THEN
</IF
```

The StoryGroups template then loops over each collection in the asset:

```
<LOOP LIST="theGroups"
<RENDER.SATELLITEPAGE PAGENAME="BurlingtonFinancial/Collection/
PlainList"
```

```
        ARGS_cid="theGroups.oid"  
        ARGS_p="Variables.p" /  
P/  
</LOOP
```

This can be seen on the news page. There is a collection called NewsGroup that is associated with the news page. This collection contains one child collection, called Energy List, which itself contains three articles. This lets an editor add or remove items from the News page by re-ranking the NewsGroup collection.

## Membership

The Burlington Financial sample site includes a membership component that has elements to sign up new members and log in existing members. These visitor registration elements are not robust enough for use on a real-world web site, but can give you a starting point for your own designs. For example, Burlington Financial has sample visitor account screens, allowing visitors to register and set their own preferences, but does not use this information to restrict visitor access to certain web pages, or to make recommendations based on a member's profile.

For more information about visitor registration in Burlington Financial and about security in general, see Chapter 23, "User Management on the Delivery System."

## Wire Feed

Both the home page template and the section front page template include a list of stories called "From the Wires." This represents content that flows automatically onto the site. Large sites often subscribe to wire feed services or other content aggregators. Stories from these sources are moved onto a site with little human intervention.

Each of the page assets that make up the major sections of Burlington Financial are associated with a query asset. For the wire feed section, this query asset contains a query to look for article assets whose source field is set to WireFeed. The queries also look at the category field of each article. Each section in Burlington Financial contains certain categories of stories, so the wire feed queries try to match those categories.

The page asset named WireFeed contains a query to return wire feed stories regardless of their category.

## Featured Funds

The fund section front page template includes a list of funds called "Featured Funds." This list contains funds that are selected using a CS-Engage segment asset. Segment assets divide visitors into groups based on common characteristics.

You build a segment asset by first creating visitor data assets. A visitor data asset stores a single piece of information about visitors to the web site; a zip code, for example. Segments are built by selecting visitor data assets to base them on, and then setting qualifying values for those criteria. For example, you can create a zip code segment that uses the value in the zip code visitor data asset to display advertisements for local businesses.

The Featured Funds list displays funds based upon whether the web site visitor belongs to the Bffrequentvisitor segment or the Highriskinvestor segment.

## Fund Finder

Fund Finder is a form that allows you to search for funds based on the criteria that you select. Some of the Fund Finder form dropdowns are hard-coded into the form; the Fund Families that the form searches, however, are listed dynamically, using the CS-Direct Advantage concept of assetsets and searchstates.

A **searchstate** is a set of search constraints based on the attribute values

```

1  <SEARCHSTATE.CREATE NAME="ss" />
2  <ASSETSET.SETSEARCHEDASSETS NAME="as"
   ASSETTYPES="ProductGroups" CONSTRAINT="ss" />
3  <ASSETSET.GETATTRIBUTEVALUES NAME="as"
   TYPENAME="PAttributes" ATTRIBUTE="FundFamily"
   LISTVARIABLE="fflist" />
4
5  <P><SELECT name="FundFamily" SIZE="3" MULTIPLE="1">
6  <OPTION SELECTED="" VALUE="NoPreference" />No Preference
7  <LOOP LIST="fflist">
8  <OPTION /><csvar NAME="fflist.value" />
9  </LOOP>
10 </SELECT></P>

```

## Page Cache Parameters

By default, CS-Direct sets the `cacheinfo` property to `cs.pgcachefolder,*` for any SiteCatalog page entries that it creates when you save a template asset. However, there are times when you may not want pages to be cached.

Pages like `BurlingtonFinancial/Util/LoginPost` and `BurlingtonFinancial/Page/AccountAccess` are specifically set to `cs.nevercache`. This is necessary since they are visitor-specific, and you don't want one visitor to see another visitor's cached page results. Real customer sites need cache fine tuning for their pages.

CS-Direct has a set of default page criteria for creating SiteCatalog entries. You can also add additional page criteria variables, but the defaults should not be removed. For more information about caching and page criteria, see Chapter 4, "Page Design and Caching."



## Section 5

# Management System Features

This section describes how to customize certain features in the Content Server user interface on your CSEE management system.

It contains the following chapters:

- Chapter 28, “Customizing the User Interface”
- Chapter 29, “Coding for the InSite Editor”
- Chapter 30, “Customizing Workflow”



## Chapter 28

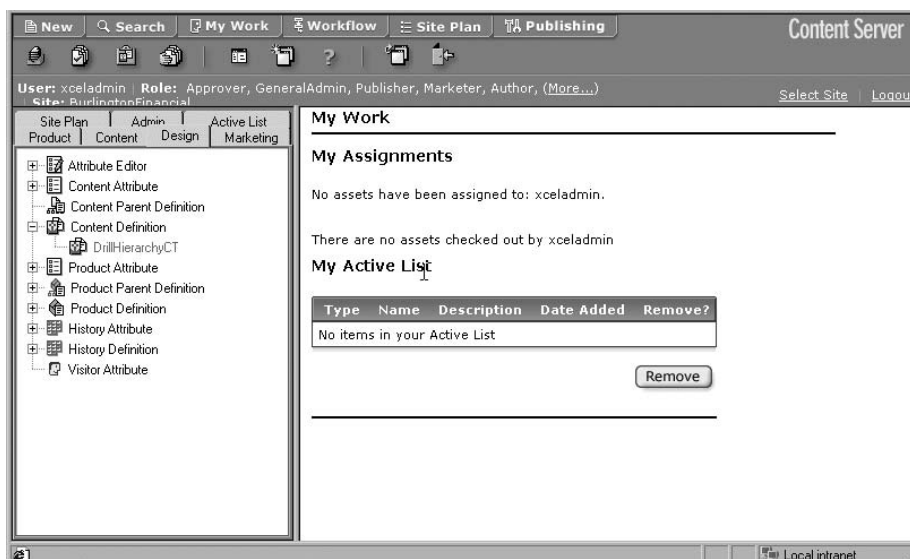
# Customizing the User Interface

Administrative and editorial users of CSEE interact with the product through various trees that display in the user interface. You can customize the CSEE user interface by modifying these trees. This chapter describes how to modify trees. It contains the following sections:

- Overview of theTree
- Trees and Security
- Tree Error Logging

## Overview of theTree

The tree appears as a set of tabs in the left pane of the main window of the Content Server interface, as shown in the following illustration:



CSEE tree tabs are created by the tree applet. You can create or modify your own trees by setting various parameters that will be passed to the tree applet. The tree applet accepts several kinds of parameters:

- Applet-wide parameters, which control the overall appearance and behavior of the applet
- Tree-specific parameters, which control the appearance and behavior of the tree
- Node parameters, which control the appearance and behavior of individual nodes on the tree
- OpURL Node parameters, which allow the tree to communicate with Content Server

A set of tree tab tables in the database stores information about tree configuration, including tab names, what roles have access to a tab, and the path to the element that populates the tree tab with data. You enter information into these tables via the Tree Tabs screens, which are accessed by clicking the Tree node on the **Admin** Tab.

## Loading the Tree Tabs

For most of the default tree tabs supplied with CSEE, requests for tree data pass through the `OpenMarket/Gator/UIFramework/LoadTab` element. The `LoadTab` element performs several basic tasks, such as checking for session timeout.

For example, the Product tab, found in the GE sample site that is provided with CS-Direct Advantage, completes the following steps as it loads:

1. Java code in the Product tab calls the `LoadTab` element.
2. The `LoadTab` element queries the `TreeTab` database tables to retrieve the elements that will load the data for the Product tree's top-level nodes. In this case, the elements are the `OpenMarket/Xcelerate/ProductGroups/LoadTree` element and the `OpenMarket/Xcelerate/Product/LoadTree` element.
3. The `OpenMarket/Xcelerate/ProductGroups/LoadTree` element and the `OpenMarket/Xcelerate/Product/LoadTree` element query the database for assets that correspond to the tree nodes and stream back node data to the tree applet.
4. The tree applet parses the node data and displays the nodes.
5. Java code in the Product tab calls an element to initialize its global pop-up menu, the `OpenMarket/Gator/UIFramework/LoadGlobalPopup` element. This element sends a `GetTypes` command to each tree loading element called by the Products tab. When the tree loading elements receive this command, they return a list of asset types whose start menu items that should appear in the global pop-up menu.
6. The `OpenMarket/Gator/UIFramework/LoadGlobalPopup` element finds the start menu items for the specified asset types and streams that information back to the tree.

Note that each asset type in the system must have a `LoadTree` element. The `LoadTree` element is a pointer to another element that actually loads the tree. If an asset type can have children, each of those children must have a `LoadTree` element. `LoadTree` elements have the following path:

`OpenMarket/Xcelerate/AssetType/MyAssetType/LoadTree`

where *MyAssetType* is the name of the asset type that the `LoadTree` element refers to.



LoadTree elements are called based on the asset type set in the `Section` field of the Manage Tree form.

Core asset types use one of several elements to load their trees. The following table contains a list of these elements:

Asset Type	Location	Description
Flex Groups	OpenMarket/Gator/UIFramework/LoadGroupNodes	Displays a FlexGroup parent hierarchy and FlexAsset children
Flex Assets	OpenMarket/Gator/UIFramework/LoadOrphanNodes	Displays flex assets that do not belong to a flex group
Site Plan Tree	OpenMarket/Xcelerate/AssetType/Page/LoadSiteTree	Displays the SitePlan tree
Site Plan Associations	OpenMarket/Gator/UIFramework/LoadChildren	Displays asset associations in the SitePlan tree
Active List	OpenMarket/Gator/UIFramework/LoadActiveList	Displays the Active List tree
Administrative Tree	OpenMarket/Gator/UIFramework/LoadAdminTree	Displays the Administrative tree
Administrative Tree Helper Elements	OpenMarket/Gator/UIFramework/Admin	Loads helper elements for the Administrative tree
Asset Types	OpenMarket/Gator/UIFramework/LoadAdministrationAsset	Displays an asset type node at the top level of the tree and the names of all assets of that type on lower levels of the tree

If you want to change the appearance or behavior of nodes in your tree, create a new tree loading element based on one of these standard elements. Your web site administrator can then specify the element's name and the path to that element in the `Section Name` and `Element Name` fields of the New Tree form, located off the Tree Tabs form. See the *CSEE Administrator's Guide* for more information about adding trees and the New Tree form.

See the "Node Parameters" section in this chapter for more information about modifying tree nodes.

## Applet-Wide Parameters

Applet-wide parameters are set in the `TreeAppletParams.xml` element. To modify the tree applet's behavior, change the parameter values set there, as shown in the following table:

**Table 1:** Applet-Wide Parameters

Parameter	Description
Debug	Turns debugging on and off. Valid values are <code>true</code> and <code>false</code> . If Debug is set to <code>true</code> , Java console debug and error messaging is turned on.
ServerBaseURL	Sets the base string to which all the node data URL strings will be appended. For example, if the <code>ServerBaseURL</code> is set to <code>file://localhost</code> , and the value of the <code>LoadURL</code> parameter is <code>NodeReader.test</code> , the URL used for loading the tree's child nodes will be as follows: <code>file://localhost/NodeReader.test</code>
BackgroundColor	Sets the background color of the tree using a decimal RGB value. If this parameter is not set, the background color defaults to the color of the HTML frame in which the tree is embedded.
TotalPanes	Sets the number of tree tabs that will be displayed. This value is set automatically.
URLTarget	The target frame in which to display node links. The default value is <code>XcelAction</code> —name of the pane on the right side of the browser window.

## Tree-Specific Parameters

Tree-specific parameters are set by the Add New Tree Tab form and the `OpenMarket\Gator\UIFramework\TreeTabAdd.xml` element that creates the Add New Tree Tab form. To modify the tree's appearance or behavior, change the parameter values shown in the following table by using the form or by altering the `TreeTabAdd` element.

**Table 2:** Tree-Specific Parameters

Parameter	Description
Title	Sets the text that is displayed on the tab.  This value is set in the <code>Title</code> field of the Manage Tree form, found on the <code>Admin</code> tab.
ToolTip	Sets the text that is displayed when the mouse pointer hovers over the tab index.  This value is set in the <code>Tool Tip</code> field of the Manage Tree form, found on the <code>Admin</code> tab.
LoadURI	The URI of the page to call to retrieve a node's children.  This value is set in the <code>TreeTabAdd</code> element.
ActionURL	The URL of the page that performs a pop-up menu action for a node in the tree. The default value points to the <code>OpURL.xml</code> element.  This value is set in the <code>TreeTabAdd</code> element.
OpenIcon	The path to the icon to use when depicting an expanded node. The default is a plus sign (+).  This value is set in the <code>TreeTabAdd</code> element.
CloseIcon	The path to the icon to use when depicting an unexpanded node. The default is a minus sign (-).  This value is set in the <code>TreeTabAdd</code> element.
LineStyle	Sets whether or not lines connect the nodes of the tree. Valid values are <code>Angled</code> and <code>blank</code> ; <code>Angled</code> is the default. If the parameter is set to <code>Angled</code> , lines connect the nodes. If the value is left blank, no lines connect the nodes.  This value is set in the <code>TreeTabAdd</code> element.
RootID	Sets the ID of the root node. This string is used for specifying the node path. It defaults to the value of the <code>Title</code> parameter.  This value is set in the <code>TreeTabAdd</code> element.
GlobalItems	This value is set in the <code>GlobalItems</code> field of the Manage Tree form, found on the <code>Admin</code> tab.
NodeItems	This value is set in the <code>NodeItems</code> field of the Manage Tree form, found on the <code>Admin</code> tab.

## Node Parameters

The node parameters determine the appearance and behavior of the nodes in your tree. To define the appearance and behavior of these nodes, you write an element which sets the node parameters (shown in the following table) and passes their values to the `BuildTreeNode.xml` element, which creates the tree nodes.

**Table 3: Node Parameters**

Parameter	Description
Label	Specifies the text to be displayed for this node. The value does not have to be unique. Default is "".
ID	A string identifier that is unique within the tree, used by Content Server to express selection paths. The ID is specified by Content Server.
ExecuteURL	The URI value of the page to be displayed when completing the "Execute" action. This value will have the value of <code>ServerBaseURL</code> prepended to it.  If the node is not executable, do not include this parameter in the node data.
URLTarget	The frame target for <code>ExecuteURL</code> . If <code>ExecuteURL</code> is not included in the node data, it defaults to the target specified in the Applet-wide parameters.
Description	An alternative to the string specified in <code>Label</code> , if you choose this option on the tree-wide pop-up menu. The default value is "".
Level	The relative level of this node, represented by a number $\geq 0$ . A value of 0 indicates that the node is an immediate child of the node requesting the data.  To load more than one level of nodes at a time, set this value to a number greater than zero. The default value is 0.
Image	The URI for the image to be prepended to the label. If this field is not included in the node data, no image will be displayed for that node.

Parameter	Description
LoadURL	<p>The URI for the subtree hierarchy. If this field is not included in the node data, this node requires no additional loading.</p> <p>The URL specified in this parameter must contain enough information so that the tree applet can find that node's children. For example, if your hierarchy is as follows:</p> <p>Product Tab &gt; Reebok &gt; Running Shoes</p> <p>the value of LoadURL is as follows:</p> <pre>ContentServer?pagename=OpenMarket/Gator/ UIFramework/ LoadTab&amp;AssetType=ProductGroups&amp;populate=O penMarket/Xcelerate/AssetType/ ProductGroups/ LoadTree&amp;op=load&amp;parent=Variables.parentid</pre> <p>where "parentid" is the assetid of the "Running Shoes" asset, and "op" and "populate" are used by LoadTab to route to your tree load element.</p>
OKAction	An action that will be displayed in the node's pop-up menu. This string may appear multiple times in the same node data set.
OpURL	<p>The URL to execute a given action on the server. This value will be prepended with the value of the ServerBaseURL parameter.</p> <p>Include this parameter in the node data unless the value of the NodeItems parameter is a null string, and thus has no OKAction specified.</p>
RefreshKeys	Creates a key or set of set of keys which can be used to refresh the tree. Set the value to the ID of the current node.

The following excerpt from the `LoadAdministrationAsset` element sets the values of the node parameters and passes those values to the `BuildTreeNode` element.

The `ListofAsset` list referred to in this excerpt is a list of information on assets of a given type. This list was generated by a SQL query that is executed elsewhere in the element.

```
<CALLELEMENT NAME="OpenMarket/Gator/UIFramework/BuildTreeNode">
  <ARGUMENT NAME="Label" VALUE="ListofAsset.name"/>
  <ARGUMENT NAME="Description" VALUE="ListofAsset.description"/>
  <ARGUMENT NAME="ID" VALUE="Variables.TreeNodeID"/>
  <ARGUMENT NAME="OpURL"
VALUE="ContentServer?pagename=OpenMarket/Gator/UIFramework/
TreeOpURL&#38;AssetType=Variables.AssetType"/>
  <ARGUMENT NAME="ExecuteURL"
VALUE="ContentServer?pagename=OpenMarket/Gator/UIFramework/
TreeOpURL&#38;AssetType=Variables.AssetType&#38;n0_=Variables.pack
edTreeNodeID&#38;op=displayNode"/>
  <ARGUMENT NAME="OKActions"
VALUE="Status;Inspect;Edit;Delete;refresh"/>
  <ARGUMENT NAME="Image" VALUE="Xcelerate/OMTree/TreeImages/
AssetTypes/Variables.AssetType.gif"/>
  <ARGUMENT NAME="RefreshKeys" VALUE="ListofAsset.id"/>
</CALLELEMENT>
```

To customize the appearance or behavior of tree nodes, copy one of the standard elements and modify the node arguments. Note that tree loading elements are passed the following variables, so any tree loading element that you create or customize must take these variables into account:

#### **Variables Passed in by the `LoadTree` element:**

- `AssetType`, which is set to the section name that was created using the New Tree form
- `op`, which is set to `init`

#### **Variables Passed in by the `LoadGlobalPopup` element:**

- `command`, which is set to `GetTypes`
- `AssetType`, which is set to the section name that was created using the New Tree form
- `varname`, which you set with a comma-separated list of asset types that you want to display start menu items for
- `popupvar`, which you set to either `true`, if you want to add items to the global pop-up, or `false`, if you do not need to add items to the pop-up

## Node Pop-up Commands

Each node on the tree has a menu that appears when the user right-clicks with the mouse. Commands on this menu allow you to refresh the node or load pages in the right side of the browser window. You can add commands to a node pop-up menu that allow you to load forms such as the status and publish forms. Any form that can be called using an asset type and ID is a good candidate for being called by a node pop-up command.

Add a new command to the node pop-up menu by completing the following steps:

1. Add the new command, exactly as you want it to appear, into the node's OKActions field.
2. Into the element that the node's OpURL refers to (usually the TreeOpURL element), add a new IF statement that calls the form you want to load.

For example, the following code from the TreeOpURL element displays a node:

```
<IF COND="Variables.op=displayNode">
  <THEN>
    <callelement NAME="OpenMarket/Gator/UIFramework/
TreeIDFromPath">
      <argument NAME="TreePath" VALUE="Variables.TreeNodePath"/>
    </callelement>
    <setvar NAME="id" VALUE="Variables.ID"/>
    <callelement NAME="OpenMarket/Xcelerate/UIFramework/
ApplicationPage">
      <argument NAME="ThisPage" VALUE="ContentDetailsFront"/>
      <argument NAME="contentfunctions" VALUE="true"/>
      <argument NAME="AssetType"
VALUE="Variables.AssetType"/>
    </callelement>
  </THEN>
```

## Refreshing the Tree

Elements that can alter the tree are responsible for refreshing the tree so that it displays current data. There are three different types of refresh action that you can specify:

- Self, which refreshes the children of the specified node
- Parent, which refreshes the specified node and its children
- Root, which refreshes the entire tree

There are two steps to refreshing the tree:

1. Code your tree customization elements so that the tree nodes that you wish to refresh have RefreshKeys. RefreshKeys are keys—usually the asset ID of the current node—which allow the refresh to take place.
2. Call the OpenMarket/Xcelerate/UIFramework/UpdateTreeOMTree element, and pass the element the \_TreeRefreshKeys\_ variable, specifying the type of refresh you want in the variable value.

You set the RefreshKeys for a node by passing the RefreshKeys argument to the BuildTreeNode element, as shown in the code sample in the “Node Parameters” section of this chapter.

To refresh the tree, call the `OpenMarket/Xcelerate/UIFramework/UpdateTreeOMTree` element, as shown in the following example:

```
<CALLELEMENT NAME="OpenMarket/Xcelerate/UIFramework/
UpdateTreeOMTree">
  <ARGUMENT NAME= "_TreeRefreshKeys_" VALUE= "Root:ActiveList"/>
</CALLELEMENT>
```

## Trees and Security

You can specify which users can see a tree by using the CSEE tree user interface. For more information about setting who can view a tree, see the *CSEE Administrator's Guide*.

## Tree Error Logging

All tree-related error and debug messages are logged to the Java Console. You can turn debugging on and off by supplying a value for the `Debug` parameter when you create a tree.

Note that enabling debug affects performance, so error logging should generally be turned off on the delivery system.



## Chapter 29

# Coding for the InSite Editor

The InSite Editor is a CS-Direct feature that enables infrequent users to find, edit, and submit content directly from the rendered (Preview) version of an asset, which means that they do not have to learn how to use the Content Server interface.

Enabling this feature requires two general steps:

- Setting the `xcelerate.enableinsite` property in the `futuretense_xcel.ini` file to `true`.
- Coding templates that invoke the InSite Editor feature for the fields that you want content providers to be able to edit in this way.

This chapter describes how to code templates that invoke the InSite Editor. It contains the following sections:

- Overview
- The `INSITE.EDIT` Tag
- Template Element Examples

## Overview

When a CSEE user with InSite Editor privileges previews any asset on a management system that has the InSite Editor configured, a separate control panel window appears, similar to the following:

The screenshot shows a web-based control panel titled "Content Server InSite Editor". It contains several sections:
 

- User Information:** Displays "User: user\_author" and "Status:".
- Asset Details:** Shows "Name:", "Field:", "Type:", and "Site: BurlingtonFinancial". There is a "save" button next to the site name.
- Assignments:** A list of three items: "Mayor of Bedford Resigns", "School Committee's Budget Exceeds Town Quota", and "Animal Control Officer Rescues Puppy". Each item has a "finish" button to its right.
- Quick Search:** A section with a "Search for" dropdown menu (currently set to "Articles"), a text input field labeled "containing", and a "search" button.

The control panel provides a subset of the CS-Direct functions that you use to work with assets, including search and workflow functions. When a user selects an asset from the **Assignments** list in the control panel, CS-Direct displays it in its rendered (Preview) form in the browser window.


When you navigate to an asset that is rendered by a template that is coded for the InSite Editor, a blue pencil icon appears next to the asset. For example:



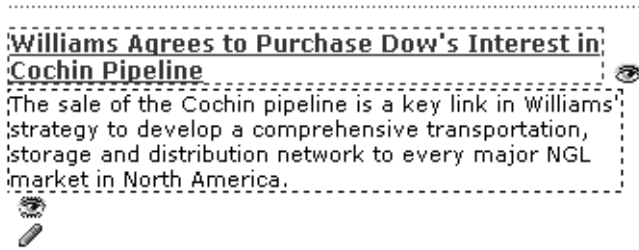
### **Trio to Buy Veba Electronics Group**

Combining Arrow and Wyle will create a formidable force in terms of demand creation and engineering. Arrow Electronics, Avnet and Schroder Ventures will buy Veba Electronics.

### **Williams Agrees to Purchase Dow's Interest in Cochin Pipeline**

The sale of the Cochin pipeline is a key link in Williams' strategy to develop a comprehensive transportation, storage and distribution network to every major NGL market in North America. 

Then, when you click on the pencil icon, the icon changes shape and a dotted line surrounds the asset like this:



You can click in the area surrounded by the dotted line, make the necessary changes, and then click **Save** in the control panel. If the template renders more than one asset with InSite Editor fields—a collection template, for example—you can edit them all and they are all saved when you click the **Save** button.

Content providers can use the InSite Editor feature to edit and approve assets and finish assignments only if the following conditions are true:

- The `xcelerate.enableinsite` property in the `futuretense_xcel.ini` file is set to `true` on the CSEE system that they are working on.
- The value of `rendermode` is either `preview` or `live`. The InSite Editor does not appear when `rendermode=export`.
- The template or element rendering the asset is tagged correctly.
- The content providers have the appropriate edit privileges: they have the `xceleditor` ACL assigned to their user names and the assets they are working with are in a workflow state that gives them permission to edit those assets (or the assets are not in a workflow process at all).
- The asset was not created or edited with the CS-Desktop feature. That is, the asset has no value in its `externaldoctype` column.

For information about how to use the control panel, see the InSite Editor help file.

## The INSITE.EDIT Tag

To code your templates to enable the InSite Editor, you use one additional CS-Direct tag, the `INSITE.EDIT` tag. You use the tag in place of the `CSVAR` tag for the fields that you want users to be able to edit with the InSite Editor.

For example, this line of code displays the contents of an asset's description field:

```
<CSVAR NAME="Variables.description"/>
```

To have the description field rendered with the InSite Editor functionality enabled for it, you would change the line of code to this:

```
<INSITE.EDIT ASSETID="Variables.cid" ASSETFIELD="description"
  ASSETFIELDVALUE="Variables.description"
  ASSETTYPE="Variables.c"/>
```

When Content Server renders the template, it interprets that line of code as follows:

- On a management system with the InSite Editor enabled (`xcelerate.insiteeedit=true`), Content Server displays the contents of the description field with the blue pencil icon; the InSite Editor functionality is active.
- On the delivery system that the template is published to and that has the InSite Editor disabled (`xcelerate.insiteeedit=false`), Content Server interprets the code as a `CSVAR` statement and displays it without the blue pencil icon.

In other words, you use the same template on both the management and the delivery system—Content Server knows what to do in each case.

There are three variations of the `INSITE.EDIT` tag which accept different parameters; for more information on these variations, see the *CSEE Developer's Tag Reference*.

Insite Editor can also handle fields that include embedded links. Use the `INSITE.EDIT` tag to display the field's contents.

## Parameters

The `INSITE.EDIT` tag takes the following parameters:

### **ASSETID (required)**

The ID of the asset whose field is to be displayed with the InSite Editor functionality. Typically, this value is held in the `cid` variable. For example:

```
ASSETID="Variables.cid"
```

### **ASSETFIELD (required)**

The name of the field that you want to display. You use different syntax for the value of this parameter when the asset identified by `ASSETID` is a basic asset than when it is a flex asset.

For example, to specify a field named `byline` for a basic asset, you use the following syntax:

```
ASSETFIELD="byline"
```

However, if the asset is a flex asset, the field is actually a flex attribute (which is also an asset). In this case, you use the following syntax:

```
ASSETFIELD="Attribute_byline"
```

**ASSETFIELDVALUE (required)**

The current or default value of the field; that is, the value of the field when the asset is loaded. For example, this is the code for a field named `byline` for a basic asset:

```
ASSETFIELDVALUE="Variables.byline"
```

This is the code for an attribute named `byline` for a flex asset:

```
ASSETFIELDVALUE="Variables.Attribute_byline"
```

**ASSETTYPE (required)**

The asset type of the asset identified with the `ASSETID` parameter.

**EWEBEDITPRO (optional)**

If you are also using the `eWebEditPro` HTML editor from Ektron on your management system, you can use `eWebEditPro` as the input type for a field when it is in InSite Editor edit mode. By default, `eWebEditPro` is disabled.

To enable `eWebEditPro` for the field, provide this parameter and set it to `true`. For example:

```
EWEBEDITPRO="true"
```

**WIDTH (optional)**

By default, the width of the field in the InSite Editor edit mode is set to 100%. You can change the width by using either a percentage or a number in pixels.

**HEIGHT (optional)**

By default, the height of a field displayed in the InSite Editor edit mode is 200 pixels. You can change the height by providing the number of pixels. Note that you cannot provide a percentage for the `HEIGHT` parameter.

## Syntax

Following is an example of the syntax for the `INSITE.EDIT` tag. This tag enables the InSite Editor for the `byline` field of a basic asset:

```
<INSITE.EDIT
  ASSETID="Variables.cid"
  ASSETFIELD="byline"
  ASSETFIELDVALUE="Variables.byline"
  ASSETTYPE="Variables.c"
  WIDTH="75"
  HEIGHT="150"/>
```

If the asset is a flex asset, the same code would be written as follows:

```
<INSITE.EDIT
  ASSETID="Variables.cid"
  ASSETFIELD="byline"
  ASSETFIELDVALUE="Variables.Attribute_byline"
  ASSETTYPE="Variables.c"
  WIDTH="75"
  HEIGHT="150"/>
```

## Supported Data Types and Input Types

This section describes the kinds of fields and attributes whose values can be edited with the InSite Editor.

### Basic Assets

For basic assets—the default CS-Direct asset types, the sample site article and imagefile asset types, and any asset type that you create with AssetMaker—you can use the InSite Editor on a field with any data type (`STORAGE TYPE`) other than timestamp. Those data types are as follows:

- CHAR
- VARCHAR
- SMALLINT
- INTEGER
- BIGINT
- DOUBLE

Additionally, the input type for the field must be compatible. That is, you should enable the InSite Editor functionality only for fields whose input style is text, textarea, or eWebEditPro.

### Flex Assets

For flex assets or flex parent assets, fields are flex attributes. You can use the InSite Editor to display the value of the flex attributes of any type other than date or asset in the template for a flex asset or flex parent asset.

Specifically, you can use the InSite Editor for attributes of any of the following types:

- float
- integer
- money
- string
- text
- blob

## Template Element Examples

This section provides a template example for both basic and flex assets. For longer examples, use Content Server Explorer to examine the following elements:

- ElementCatalog/BurlingtonFinancial/Article/Full (for a basic asset type)
- ElementCatalog/BurlingtonFinancial/Article/Summary (for a basic asset type)
- ElementCatalog/OpenMarket/Demos/CatalogCentre/GE/Templates/blurb-story (for a flex asset type)

## Example for Basic Asset

This template element is for a Burlington Financial article asset. It does the following:

- Logs the template as a dependent of the page or pagelet being rendered
- Loads the asset with an `ASSET.LOAD` tag, which logs the asset as an **exact** dependent of the page or pagelet being rendered
- Displays the `urlbody` field and the `description` field as fields that can be edited with the InSite Editor

```
<?xml version="1.0" ?>
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- Article/BasicInsite
-
- INPUT
- Variables.c - asset type (Article)
- Variables.cid - id of the asset to display
- Variables.tid - template used to display the page(let)
- OUTPUT
-
-->

<!-- Log the template as a dependent of the pagelet being
rendered, so changes to the template asset will force regeneration
of the page(let). -->

<IF COND="IsVariable.tid=true">
  <THEN>
    <RENDER.LOGDEP cid="Variables.tid" c="Template"/>
  </THEN>
</IF>

<!-- ASSET.LOAD logs an exact dependency between the asset and the
page being rendered with this element -->

<ASSET.LOAD NAME="anAsset" TYPE="Variables.c"
  OBJECTID="Variables.cid"/>

<!-- get all the primary table fields of the asset -->

<ASSET.SCATTER NAME="anAsset" PREFIX="asset"/>

<!-- Display the description and allow it to be edited through the
InSite Editor feature.-->

<INSITE.EDIT ASSETID="Variables.cid" ASSETFIELD="description"
  ASSETFIELDVALUE="Variables.asset:description"
  ASSETTYPE="Variables.c"/><br/>

<!-- Display the contents of the urlbody file and allow it to be
edited through the InSite Editor feature.-->
```

```

<ICS.GETVAR name="asset:urlbody" encoding="default"
output="bodyvar"/>
<INSITE.EDIT ASSETID="Variables.cid" ASSETFIELD="urlbody"
  ASSETFIELDVALUE="Variables.bodyvar" ASSETTYPE="Variables.c"/>

</FTCS>

```

Notice the line of code directly above the last `INSITE.EDIT` tag. When you use the `ASSET.SCATTER` tag to scatter a URL field, you must use the `ICS.GETVAR` method as shown in this example.

## Example for Flex Assets

This template element is for a product asset with a field named `productDescription`. It does the following:

- Logs the template as a dependent of the page or pagelet being rendered
- Creates an assetset with one product asset in it.
- Displays the `productDescription` field as a field that can be edited with the InSite Editor.

```

<?xml version="1.0" ?>
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- Products/BasicInsite
-
- INPUT
- Variables.c - asset type (Products)
- Variables.cid - id of the asset to display
- Variables.tid - template used to display the page(let)
- OUTPUT
-
-->

<!-- Log the template as a dependent of the pagelet being
rendered, so
changes to the template asset will force regeneration of the
page(let)
-->

<IF COND="IsVariable.tid=true">
  <THEN>
    <RENDER.LOGDEP cid="Variables.tid" c="Template"/>
  </THEN>
</IF>

<!-- Because this is a flex asset, we do not use ASSET.LOAD.
Instead, we create an assetset with the ASSETSET tag family and
name it 'as' -->

<ASSETSET.SETASSET NAME="as" ID="Variables.cid"
TYPE="Variables.c"/>

```



```

<!-- Retrieve the attribute named productDescription.-->

<ASSETSET.GETATTRIBUTEVALUES
  NAME="as"
  ATTRIBUTE="productDescription"
  TYPENAME="PAttributes"
  LISTVARNAME="productDescriptionList"/>

<!-- Display the productDescription and allow it to be edited
through the InSite Editor feature. Notice that for flex assets,
you prepend 'Attribute_' in front of the attribute name.-->

<INSITE.EDIT
  ASSETID="Variables.cid"
  ASSETFIELD="Attribute_productDescription"
  ASSETFIELDVALUE="productDescriptionList.value"
  ASSETTYPE="Variables.c"/><br/>

</FTCS>

```

## Example for an Attribute of Type Blob

This example retrieves and displays a Blob.

```

<?xml version="1.0" ?>
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- get the URL -->

<ASSETSET.GETATTRIBUTEVALUES
  NAME="InSiteCourse"
  TYPENAME="BUAttribute"
  ATTRIBUTE="URL"
  LISTVARNAME="URLList"/>

<BLOBSERVICE.READDATA
  ID="URLList.value"
  LISTVARNAME="URLList"/>

URL:
<INSITE.EDIT
  ASSETID="Variables.cid"
  ASSETFIELD="Attribute_URL"
  ASSETFIELDVALUE="URLList.@urldata"
  ASSETTYPE="Variables.c"/><br/>
</FTCS>

```



## Chapter 30

# Customizing Workflow

A CSEE workflow process is the series of states an asset moves through on its way to publication. The asset moves from one state to the next by taking a workflow step. Each step that the asset takes can be associated with a timed action, such as sending an e-mail to a user when an asset is assigned to them, or a workflow step condition, which prevents an asset from moving on to the next step if certain conditions are not fulfilled.

You must create the workflow step condition elements which specify the conditions that an asset must meet to move on to the next state, and the workflow action elements which perform various actions as the asset moves from one state to the next. This chapter describes these elements in greater detail and provide sample code for each element type. It contains the following sections:

- Workflow Step Conditions
- Workflow Actions

## Workflow Step Conditions

A workflow process is composed of one or more workflow states. Workflow steps move the asset from one workflow state to the next. Sometimes, however, there are conditions under which the asset should not move on to the next workflow state. You must create the element that defines the condition or conditions that prevent the asset from moving on to the next state.

This element receives the following data when it is called:

- An `IWorkflowable` object called `Object`, which represents the asset whose state is being changed
- An `IWorkflowStep` object called `Step`, which represents the current workflow step
- The `StepUser` variable, which contains the ID of the user attempting the step
- Variables specified as name-value pairs when a `StepCondition` is defined in the CSEE user interface. For more information about defining `StepConditions`, see the *CSEE Administrator's Guide*.

The workflow step condition element should check for a condition and return a Boolean value. If the value is false, the step will not proceed.

The following code comes from a sample workflow step condition element:

```

1  <?xml version="1.0" ?>
2  <!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
3  <FTCS Version="1.1">
4  <!-- OpenMarket/Xcelerate/Actions/Workflow/StepConditions/
   ExampleStepCondition
5  -
6  - INPUT
7  -
8  - OUTPUT
9  -
10 -->
11 <csvar NAME="This step condition will check if step can be
   taken"/><br/>

```

Line 12 sets an empty ReturnVal variable. In lines 31 and 36, this variable will be set with the reasons why the step cannot proceed.

```

12  <setvar NAME="ReturnVal" VALUE="Variables.empty"/>
13
14  <!--change the value of ReturnVal to a non-empty string
   later on, if you want to stop the step --> <!-- most of
   the stuff below are debugging statements and also show you
   some items available to you to set up a condition for
   stopping the step-->

```

Line 16 uses the WORKFLOWABLEASSET.GETDISPLAYABLENAME tag to get the name of the asset that is in workflow.

```

15  <!-- get asset -->
16  <WORKFLOWABLEOBJECT.GETDISPLAYABLENAME OBJECT="Object"
   VARNAME="assetdisplayablename"/>
17  Object:<csvar NAME="Variables.assetdisplayablename"/
   ><br/>

```

Line 19 creates a variable called StepUser which will contain the ID of the user attempting to take the step. Line 20 uses the USERMANAGER.GETUSER tag to load the user's ID into the StepUser variable. Line 22 uses the CCUSER.GETNAME tag to retrieve a human-readable user name, and line 23 uses the csvar tag to display that user name.

```

18  <!-- get userid -->
19  Userid: <csvar NAME="Variables.StepUser"/><br/>
20  <USERMANAGER.GETUSER OBJVARNAME="myUserObj"
   USER="Variables.StepUser"/>
21  <CCUSER.GETNAME NAME="myUserObj" VARNAME="uname"/>
22  Username: <csvar NAME="Variables.uname"/><br/>

```

Line 24 uses the WORKFLOWSTEP.GETID tag to get the ID of the current workflow step. The WORKFLOWSTEP.GETNAME tag, used in line 25, loads the step with the specified name.

```

23  <!-- getstep -->
24  <WORKFLOWSTEP.GETID NAME="Step" VARNAME="sid"/>
25  Stepid: <csvar NAME="Variables.sid" />

```

```

26      <WORKFLOWSTEP.GETNAME NAME="Step" VARNAME="sname"/>
27      Stepname: <csvar NAME="Variables.sname"/><br/><br/>

```

Lines 28 through 40 define the conditions that will stop the change of step from taking place. The `forcestop` and `notalloweduser` variables that the conditionals check were set as arguments when the sample step condition was defined in the CSEE interface. In a real step condition, you would test for the condition of your choice here—seeing whether an article asset has an associated image, for example.

```

28      <!-- This is the actual condition to stop the
29      step. The following is just an example. -->
30      <if COND="Variables.forcestop=true">
31      <then>
32      <setvar NAME="RetVal" VALUE="You can not
33      take this step because forcestop=true"/>
34      </then>
35      <else>
36      <if
37      COND="Variables.uname=Variables.notalloweduser">
38      <then>
39      <setvar NAME="RetVal" VALUE="You
40      are not allowed to take this step"/>
41      </then>
42      </if>
43      </else>
44      </if>
45      </FTCS>

```

## Workflow Actions

As an asset moves through workflow, it can trigger a **workflow action**. A workflow action can do anything from send an email to alert a user that he has a new asset to evaluate to breaking a deadlock after a specified period of time has elapsed. There are five types of workflow actions:

- Step actions, which are executed as part of a transition between workflow states.
- Timed actions, which are triggered by deadlines when the asset is in a given state, thus associating the asset with a specific assignment.
- Deadlock actions, which are executed when an asset needs a unanimous vote in order to move to the next state, but the voters differ on which step the asset should take. The deadlock action will be executed whenever users choose different steps for the asset to move to.
- Group deadlock actions, which are executed when the assets in a workflow group need a unanimous vote in order to move to the next state, but the voters choose different steps, creating a deadlock.
- Delegation actions, which are executed when an asset is delegated. The delegated asset remains in its current workflow state, but is assigned to a new user.

Your workflow administrator must first define workflow actions using the CSEE user interface. Then you must create the elements that accomplish these workflow actions.

FatWire provides several sample workflow action definitions for you to look at. For more information about defining workflow actions, see the *CSEE Administrator's Guide*.

The following sections describe sample workflow action elements.

## Step Action Elements

A Step Action element receives the following data when it is called:

- A WorkflowEngine object called WorkflowEngine.
- An ObjectTotal variable, which represents the total number of assets whose state is being changed.
- An IWorkflowable object called Object $nnn$ , which represents the assets whose state is being changed.  $nnn$  is a number between 0 and ObjectTotal -1.
- An IWorkflowStep object called Step, which represents the workflow step being considered.
- A StepTargetUser variable, which is a comma-separated list of the step's target users.
- A StepUser variable, which contains the ID of the user attempting the step.
- A Group variable, which contains the ID of the workflow group to which the assets belong (if you are using workflow groups).
- Any variables that your workflow administrator has created in the definition for this Step Action.

The following Step Action element approves assets for publish; most other Step Action elements send an e-mail to the assignees.

```

1  <?xml version="1.0" ?>
2  <!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
3  <FTCS Version="1.1">
4  <!-- OpenMarket/Xcelerate/Actions/Workflow/StepActions/
    ApproveForPublish
5  -
6  - INPUT
7  -     Variables.ObjectTotal - number of loaded
    workflowasset objects
8  - Object[n] - loaded workflowasset objects, where n = 0 -
    Variables.ObjectTotal
9  -targets - one or more comma separated names of PubTargets
    for which to approve the asset
10 -
11 - OUTPUT
12 -
13 -->
14
15 <!-- This is an action element called by step actions
    ApproveForPublish-->
16 This step action element will approve an asset for
    publish.<br/>
```

Line 18 uses the SETCOUNTER tag to create a counter which keeps track of the number of assets to approve. Lines 19 through 25 use the LOOP tag to loop through the assets and retrieve the asset types and IDs.

```

17 <!-- get the id and assettype of the asset(s) to approve --
   >
18 <SETCOUNTER NAME="count" VALUE="0"/>
19 <LOOP COUNT="Variables.ObjectTotal">
20 <WORKFLOWASSET.GETASSETTYPE OBJECT="ObjectCounters.count"
   VARNAME="assettype"/>
21 <WORKFLOWASSET.GETASSETID OBJECT="ObjectCounters.count"
   VARNAME="assetid"/>
22 <SETVAR NAME="idCounters.count" VALUE="Variables.assetid"/>
23 <SETVAR NAME="typeCounters.count"
   VALUE="Variables.assettype"/>
24 <INCCOUNTER NAME="count" VALUE="1"/>
25 </LOOP>

```

Line 27 uses the STRINGLIST tag to create a comma-separated list of publish target names. Lines 31 through 46 loop through this list, using the PUBTARGET.LOAD and PUBTARGET.GET tags to load information about the publish targets from the PubTarget table. This information and information about the assets to be approved are passed to the ApprovePost element for further processing in line 37.

```

26 <!-- approve for each destination -->
27 <STRINGLIST NAME="publishTargets" STR="Variables.targets"
   DELIM=","/>
28
29 <if COND="IsList.publishTargets=true">
30 <then>
31 <LOOP LIST="publishTargets">
32 <PUBTARGET.LOAD NAME="pubtgt" FIELD="name"
   VALUE="publishTargets.ITEM"/>
33 <if COND="IsError.Variables.errno=false">
34 <then>
35 Approving for publish to <CSVAR NAME="publishTargets.ITEM"/
   ><br/>
36 <PUBTARGET.GET NAME="pubtgt" FIELD="id" OUTPUT="pubtgt:id"/
   >
37 <CALLELEMENT NAME="OpenMarket/Xcelerate/PrologActions/
   ApprovePost">
38 <ARGUMENT NAME="targetid" VALUE="Variables.pubtgt:id"/>
39 <ARGUMENT NAME="assetTotal" VALUE="Counters.count"/>
40 </CALLELEMENT>
41 </then>
42 <else>
43 Cannot approve for publish to destination: <CSVAR
   NAME="publishTargets.ITEM"/>, Error: <CSVAR
   NAME="Variables.errno"/>
44 </else>
45 </if>
46 </LOOP>
47 </then>
48 <else>

```

```

49 Cannot approve for publish. This step action requires a
    targets argument with one or more comma separated
    publishing destination names.
50 </else>
51 </if>
52
53 </FTCS>

```

## Timed Action Elements

Timed Action elements receive the following data when they are called:

- A WorkflowEngine object called WorkflowEngine.
- A WorkflowAssignmentTotal variable, which contains the total number of assignments for which this action applies.
- An IWorkflowAssignment object called WorkflowAssignment $nnn$ , which represents assignments to apply the action to.  $nnn$  is a number greater than zero.
- An optional Group variable, which contains the ID of the workflow group to which the assets belong (if you are using workflow groups)
- Any variables that your workflow administrator has created in the definition for this Timed Action.

The following excerpt is from a Timed Action element that sends an e-mail. The text of the subject and body of this e-mail are set in the Workflow E-mail forms that you access from the Admin tab in the Content Server user interface. The body text expects the following variables:

- Variables.assetname, which contains the name of the current asset
- Variables.assigner, which is the name of the user who completed the previous state in the workflow process
- Variables.instruction, which is the text that the assigner puts in the Action to Take text box as he or she completes an assignment

```

1  <!-- This is a timed action element -->
2
3  <!-- get total assignments -->
4  <if COND="IsVariable.WorkflowAssignmentTotal=true">
5  <then>
6  <setvar NAME="NumOfAssignments"
    VALUE="Variables.WorkflowAssignmentTotal"/>
7  </then>
8  <else>
9  <setvar NAME="NumOfAssignments" VALUE="0"/>
10 </else>
11 </if>
12
13 <!-- For each assignment object, get assignee -->
14 <setcounter NAME="COUNT" VALUE="0"/>
15 <if COND="Variables.NumOfAssignments!=0">
16 <then>
17 <loop FROM="0" COUNT="Variables.NumOfAssignments">

```



```

18 <setvar NAME="tmp"
   VALUE="WorkflowAssignmentCounters.COUNT"/>
19 <WORKFLOWASSIGNMENT.GETASSIGNEDUSERID NAME="Variables.tmp"
   VARNAME="assigneduserid"/>
20
21 <!-- get user -->
22     <WORKFLOWASSIGNMENT.GETASSIGNEDOBJECT
   NAME="Variables.tmp" OBJVARNAME="assignedobj"/>
23
24 <!-- get asset -->
25 <WORKFLOWABLEOBJECT.GETDISPLAYABLENAME OBJECT="assignedobj"
   VARNAME="assetname"/>
26
27 <!-- get deadline and format it -->
28 <WORKFLOWASSIGNMENT.GETDEADLINE NAME="Variables.tmp"
   VARNAME="deadline"/>
29 <DATE.DEFAULTTZ VARNAME="tzone"/>
30 <DATE.CLOCKLIST LISTVARNAME="DueTime"
   CLOCK="Variables.deadline" TIMEZONE="Variables.tzone"/>
31 <setvar NAME="time" VALUE="DueTime.fulldate
   DueTime.longtime"/>
32
33 <!-- get email address --->
34 <USERMANAGER.GETUSER USER="Variables.assigneduserid"
   OBJVARNAME="userobj"/>
35 <CCUSER.GETNAME NAME="userobj"
   VARNAME="assigned_user_name"/>
36 <CCUSER.GETEMAIL NAME="userobj" VARNAME="EmailAddress"/>
37
38 <IF COND="IsVariable.EmailAddress=true">
39 <THEN>
40
41 <!-- load email object -->
42 <EMAILMANAGER.LOAD NAME="Variables.emailname"
   OBJVARNAME="emailobject"/>
43

```

In lines 45 and 48, the variables in the e-mail object, subject and body, are replaced by their values.

```

44 <!-- translate subject -->
45 <EMAIL.TRANSLATESUBJECT NAME="emailobject"
   PARAMS="assetname=Variables.assetname" VARNAME="subject"/>
46
47 <!-- translate body -->
48 <EMAIL.TRANSLATEBODY NAME="emailobject"
   PARAMS="assetname=Variables.assetname&#38;time=Variables.time"
   VARNAME="body"/>
49
50 <!-- send mail -->
51 <sendmail TO="Variables.EmailAddress"
   SUBJECT="Variables.subject" BODY="Variables.body"/>
52 </THEN>

```

```

53 <ELSE>
54 Email address: None<br/>
55 </ELSE>
56 </IF>
57
58 <inccounter NAME="COUNT" VALUE="1"/>
59 </loop>
60 </then>
61 </if>
62
63
64 </FTCS>

```

## Deadlock Action Elements

Deadlock Action elements receive the following data when they are called:

- A WorkflowEngine object
- An ObjectTotal variable, which represents the total number of deadlocked assets
- An IWorkflowable object called Objectnnn, which represents the deadlocked assets
- An IWorkflowStep object called Step, which represents the workflow step
- A StepTotal variable, which contains the number of steps chosen by individual users
- A StepUser variable, which contains the ID of the user attempting the step
- An optional Group variable, which contains the ID of the workflow group to which the assets belong (if you are using workflow groups)
- Any variables that your workflow administrator has created in the definition for this Deadlock Action.

The following Deadlock Action element sends an e-mail to the users who approve the asset.

The text of the subject and body of this e-mail are set in the Workflow E-mail forms in the CSEE administrative user interface. The body text expects the following variables:

- Variables.assetname, which contains the name of the current asset
- Variables.header and Variables.message, which contain the text of the e-mail's body

```

1  <?xml version="1.0" ?>
2  <!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
3  <FTCS Version="1.1">
4  <!-- OpenMarket/Xcelerate/Actions/Workflow/DeadlockActions/
   SendEmailToAssignees
5  -
6  - INPUT
7  -
8  - OUTPUT
9  -
10 -->
11

```

```

12 <!-- This is an action element called by step actions
    SendAssignmentEmail and SendRejectionEmail-->
13
14 <csvar NAME="This deadlock action element will send
    emails"/><br/>

```

Line 16 uses the EMAILMANAGER.LOAD tag to load an e-mail object.

```

15 <!-- load email object -->
16 <EMAILMANAGER.LOAD NAME="Variables.emailname"
    OBJVARNAME="emailobject"/>

```

Lines 17 through 25 create a NumOfSteps variable, which contains either the total number of assets being delegated or zero.

```

17 <!-- get total steps -->
18 <if COND="IsVariable.StepTotal=true">
19 <then>
20 <setvar NAME="NumOfSteps" VALUE="Variables.StepTotal"/>
21 </then>
22 <else>
23 <setvar NAME="NumOfSteps" VALUE="0"/>
24 </else>
25 </if>
26
27 <removevar NAME="Step"/>
28 <setvar NAME="Header" VALUE="The following users have
    chosen the corresponding steps that has resulted in a
    deadlock. Please take appropriate actions to resolve
    deadlock:"/>
29 <setvar NAME="Message" VALUE="Variables.empty"/>

```

Lines 30 through 75 loop through the list of users who have put the asset in deadlock, creating an e-mail for each one. Line 39 uses the USERMANAGER.GETUSER tag to load the user information of the user specified in the ID. Lines 40 and 41 use CCUSER tags to get the user's name and e-mail address.

```

30 <!-- For each assignment object, get assignee -->
31 <setcounter NAME="COUNT" VALUE="0"/>
32 <if COND="Variables.NumOfSteps!=0">
33 <then>
34 <loop FROM="0" COUNT="Variables.NumOfSteps">
35 <!-- get assigner -->
36
37 <setvar NAME="userid"
    VALUE="Variables.StepUserCounters.COUNT"/>
38 <!-- get email address --->
39 <USERMANAGER.GETUSER USER="Variables.userid"
    OBJVARNAME="userobj"/>
40 <CCUSER.GETNAME NAME="userobj" VARNAME="user_name"/>
41 <CCUSER.GETEMAIL NAME="userobj" VARNAME="EmailAddress"/>

```

Lines 42 through 47 use the WORKFLOWSTEP and WORKFLOWSTATE tags to retrieve the asset's starting and ending steps and states.

```

42 <WORKFLOWSTEP.GETNAME NAME="StepCounters.COUNT"
    VARNAME="stepname"/>

```

```

43 <WORKFLOWSTEP.GETSTARTSTATE NAME="StepCounters.COUNT"
    VARNAME="startstate"/>
44 <WORKFLOWSTEP.GETENDSTATE NAME="StepCounters.COUNT"
    VARNAME="endstate"/>
45
46 <WORKFLOWSTATE.GETSTATENAME NAME="Variables.startstate"
    VARNAME="startstatename"/>
47 <WORKFLOWSTATE.GETSTATENAME NAME="Variables.endstate"
    VARNAME="endstatename"/>
48
49
50 <setvar NAME="Message" VALUE="Variables.Message
    Variables.user_name: Variables.stepname - "/>
51 <!--
52 user:<csvar NAME="Variables.user_name"/><br/>
53 step name:<csvar NAME="Variables.stepname"/><br/>
54 startstate name:<csvar NAME="Variables.startstate"/><br/>
55 endstate name:<csvar NAME="Variables.endstate"/><br/>
56 -->
57
58 <!-- get asset -->
59 <WORKFLOWABLEOBJECT.GETDISPLAYABLENAME
    NAME="Variables.ObjectCounters.COUNT" VARNAME="assetname"/>

```

In lines 62 and 65, the variables in the e-mail object, subject and body, are replaced by their values.

```

60 <!-- translate subject -->
61 <SETVAR NAME="params"
    VALUE="username=Variables.user_name&#38;header=Variables.He
    ader&#38;message=Variables.Message&#38;assetname=Variables.
    assetname"/>
62 <EMAIL.TRANSLATESUBJECT NAME="emailobject"
    PARAMS="Variables.params" VARNAME="subject"/>
63
64 <!-- translate body -->
65 <EMAIL.TRANSLATEBODY NAME="emailobject"
    PARAMS="Variables.params" VARNAME="body"/>
66
67 <!-- send mail -->
68 <sendmail TO="Variables.EmailAddress"
    SUBJECT="Variables.subject" BODY="Variables.body"/>
69
70 <inccounter NAME="COUNT" VALUE="1"/>
71 </loop>
72 </then>
73 </if>
74 email message:<csvar NAME="Variables.Header
    Variables.Message"/><br/>
75
76
77 </FTCS>

```

## Group Deadlock Action Elements

Group Deadlock action elements receive the following data when they are called:

- A WorkflowEngine object called WorkflowEngine.
- An ObjectTotal variable, which represents the total number of deadlocked assets.
- An IWorkflowable object called Object $nnn$ , which represents the deadlocked asset.  $nnn$  is a number greater than zero.
- An IWorkflowStep object called Step, which represents the workflow step.
- A StepTotal variable, which contains the number of steps chosen by individual users
- A StepUser variable, which contains the ID of the user attempting the step.
- A Group variable, which contains the ID of the workflow group that is deadlocked.
- Any variables that your workflow administrator has created in the definition for this Group Deadlock Action.

The following Group Deadlock Action element sends an e-mail to the users who approve the asset.

The text of the subject and body of this e-mail are set in the Workflow E-mail forms in the CSEE administrative user interface. The body text expects the following variables:

- Variables.assetname, which contains the name of the current asset
- Variables.header and Variables.message, which contain the text of the e-mail's body

```

1  <?xml version="1.0" ?>
2  <!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
3  <FTCS Version="1.1">
4  <!-- OpenMarket/Xcelerate/Actions/Workflow/GroupActions/
   SendEmailToAssignees
5  -
6  - INPUT
7  -
8  - OUTPUT
9  -
10 -->
11
12 <!-- user code goes here -->
13
14 <csvar NAME="This group deadlock action element will send
   emails"/><br/>
15 <!-- load email object -->
16 <EMAILMANAGER.LOAD NAME="Variables.emailname"
   OBJVARNAME="emailobject"/>
17 <!-- get group -->
18 <WORKFLOWENGINE.GETGROUPID ID="Variables.Group"
   OBJVARNAME="grpobj"/>
19 <WORKFLOWGROUP.GETNAME NAME="grpobj" VARNAME="GroupName"/>
20
21 <!-- get total steps -->
22 <if COND="IsVariable.StepTotal=true">

```

```

23 <then>
24 <setvar NAME="NumOfSteps" VALUE="Variables.StepTotal"/>
25 </then>
26 <else>
27 <setvar NAME="NumOfSteps" VALUE="0"/>
28 </else>
29 </if>
30
31 <removevar NAME="Step"/>
32 <setvar NAME="Header" VALUE="The following users have
    chosen the corresponding steps that has resulted in a
    deadlock for the group: Variables.GroupName. Please take
    appropriate actions to resolve deadlock:"/>
33 <setvar NAME="Message" VALUE="Variables.empty"/>
34 <!-- For each assignment object, get assignee -->
35 <setcounter NAME="COUNT" VALUE="0"/>
36 <if COND="Variables.NumOfSteps!=0">
37 <then>
38 <loop FROM="0" COUNT="Variables.NumOfSteps">
39 <!-- get assigner -->
40 <setvar NAME="userid"
    VALUE="Variables.StepUserCounters.COUNT"/>
41 <!-- get email address --->
42 <USERMANAGER.GETUSER USER="Variables.userid"
    OBJVARNAME="userobj"/>
43 <CCUSER.GETNAME NAME="userobj" VARNAME="user_name"/>
44 <CCUSER.GETEMAIL NAME="userobj" VARNAME="EmailAddress"/>
45
46 <WORKFLOWSTEP.GETNAME NAME="StepCounters.COUNT"
    VARNAME="stepname"/>
47 <WORKFLOWSTEP.GETSTARTSTATE NAME="StepCounters.COUNT"
    VARNAME="startstate"/>
48 <WORKFLOWSTEP.GETENDSTATE NAME="StepCounters.COUNT"
    VARNAME="endstate"/>
49
50 <WORKFLOWSTATE.GETSTATENAME NAME="Variables.startstate"
    VARNAME="startstatename"/>
51 <WORKFLOWSTATE.GETSTATENAME NAME="Variables.endstate"
    VARNAME="endstatename"/>
52
53 <!-- get asset -->
54 <WORKFLOWABLEOBJECT.GETDISPLAYABLENAME
    NAME="Variables.ObjectCounters.COUNT" VARNAME="assetname"/>
55
56 <!-- set message -->
57 <setvar NAME="Message" VALUE="Variables.Message Asset:
    Variables.assetname, User: Variables.user_name, Step:
    Variables.stepname -- "/>
58
59 <!-- translate subject -->

```

```

60 <SETVAR NAME="params"
    VALUE="username=Variables.user_name&#38;header=Variables.He
    ader&#38;message=Variables.Message&#38;assetname=Variables.
    assetname"/>
61 <EMAIL.TRANSLATESUBJECT NAME="emailobject"
    PARAMS="Variables.params" VARNAME="subject"/>
62
63 <!-- translate body -->
64 <EMAIL.TRANSLATEBODY NAME="emailobject"
    PARAMS="Variables.params" VARNAME="body"/>
65
66 <!-- send mail -->
67 <sendmail TO="Variables.EmailAddress"
    SUBJECT="Variables.subject" BODY="Variables.body"/>
68
69 <inccounter NAME="COUNT" VALUE="1"/>
70 </loop>
71 </then>
72 </if>
73 email message:<csvar NAME="Variables.Header
    Variables.Message"/><br/>
74
75 </FTCS>

```

## Delegation Action Elements

Delegation action elements receive the following data when they are called:

- A WorkflowEngine object called WorkflowEngine.
- A CurrentUser variable, which contains the ID of the user who is delegating the asset.
- An optional Group variable, which contains the ID of the workflow group. All objects to be delegated must be in the same workflow group.
- An ObjectTotal variable, which represents the total number of assets being delegated.
- An IWorkflowable object called Object $nnn$ , which represents the assets being delegated.  $nnn$  represents a number greater than zero.

Delegation action elements should be coded like other Workflow Action elements.





## Section 6

# **CS-Bridge XML**

This section explains how to use the CS-Bridge XML framework to share content or business documents in XML format with other enterprise applications.

It contains the following chapters:

- Chapter 31, “Overview of CS-Bridge XML”
- Chapter 32, “Processing XML Documents”



## Chapter 31

# Overview of CS-Bridge XML

This chapter introduces XML document exchange process using the CS-Bridge XML framework. It describes the software components of the system, document process flow, and required configuration steps.

Chapter sections cover the following topics:

- Software Components
- Document Flow
- Configuration Steps

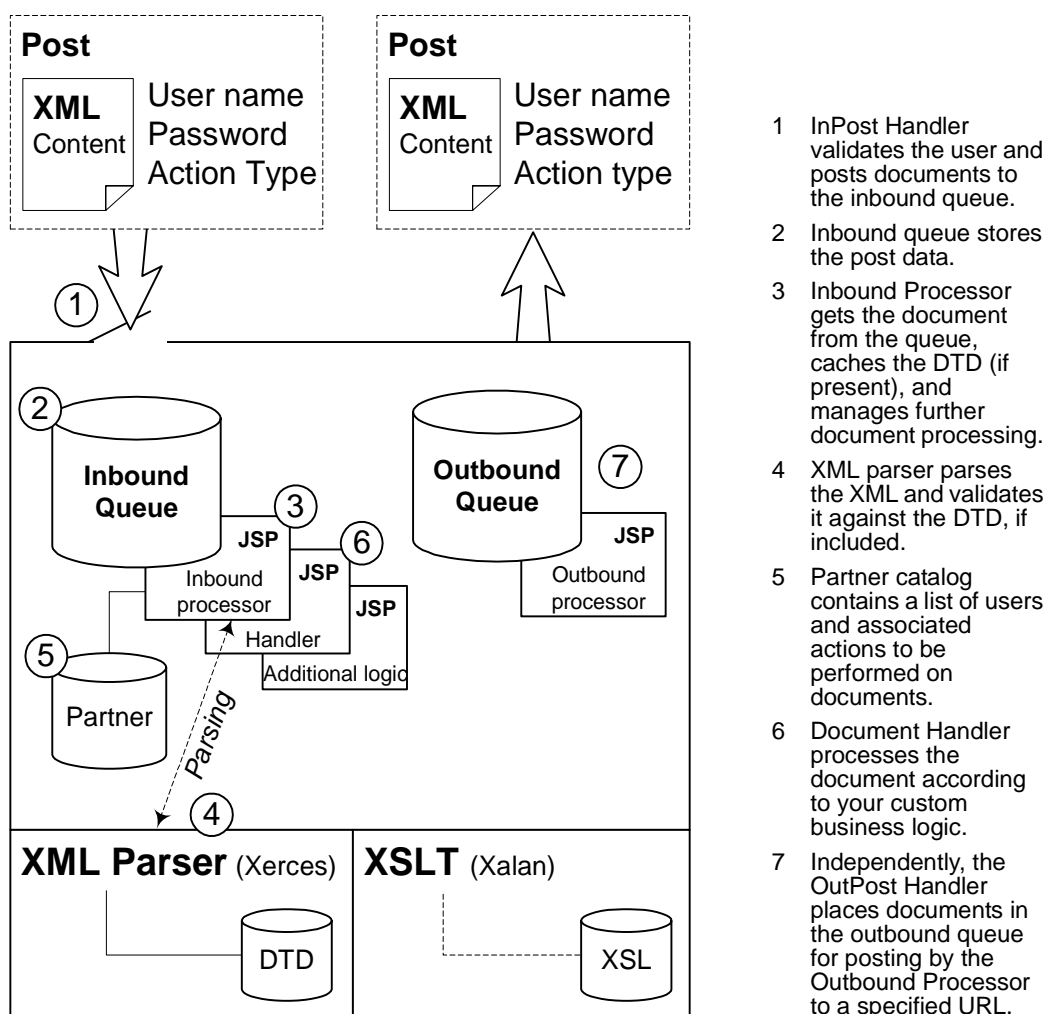
CS-Bridge XML, which is included as part of the base CSEE product, requires no additional installation.

## Software Components

CS-Bridge XML receives, processes, and posts XML documents. These actions are accomplished by the following integrated software components:

- InPost Handler, inbound queue, and Inbound Processor
- XML parser and XSLT processor
- Partner catalog and DTD catalog
- Document Handler
- OutPost Handler, outbound queue, and Outbound Processor
- Event Handler

**Figure 4:** XML Document Exchange Process



## Document Flow

CS-Bridge XML programs are separate applications that operate independently or in concert according to the following logical functions:

- Inbound processing, including user validation and custom document handling
- XML parsing and document transformation
- Outbound processing, including posting to a specified location

Processing does not have to occur in the order shown in Figure 1. The system is designed so that you can use one or more of its components as needed, depending on your project requirements. For example, you can choose to use only outbound processing capabilities, or begin with outbound processing and follow with an inbound processing step. In more detail, the following table describes how a document posted to CS-Bridge XML moves through the system.

Processing Step		CS-Bridge XML Action
1	Post the document to Content Server.	<p>Your application posts an XML document to Content Server using HTTP protocol as the delivery mechanism.</p> <p>Also included in the HTTP post are user name, password, and (depending on the authentication method used) a previously defined action type. The optional action type is a string, unique to the user, that describes what kind of document has been sent, for example, <code>actiontype=AddOrder</code>. Later on, the associated action type indicates how the document is to be processed.</p>
2	Pass the document to the inbound queue.	<p>When the document arrives, the InPost Handler checks the user name against a list of registered users to determine whether the document should be allowed into the queue.</p> <p>Posts that pass the authentication step result in a new entry in the inbound queue. The queue is a Content Server database table that stores pointers to files, which are placed in a directory.</p> <p>This database table is not automatically flushed. Instead, an attribute of each entry is set to <code>done</code> once it has been processed. This attribute, <code>statusstr</code>, can be set to one of the following states: <code>new</code>, <code>done</code>, or one of several error conditions.</p>
3	Get the document from the inbound queue and begin processing.	<p>The Inbound Processor picks up the next new entry in the inbound queue.</p> <p>The processing element responsible for document processing can be invoked manually, or configured via changes to the EventHandler element to operate on a schedule, for example, every 60 seconds.</p>

Processing Step	CS-Bridge XML Action
<b>4</b> Parse the XML content and validate the DTD.	<p>The Inbound Processor presents the XML to the parser, which verifies that the XML is well formed and that it conforms to the DTD, if one is provided.</p> <p>The DTD can be external or included within the document. The Inbound Processor caches external DTDs in a DTD database table, and the XML Parser returns a DOM object, which consists of the contents of the document transformed into a tree structure.</p> <p>DTD validation can be independently turned on or off. If off, the system checks for well formed XML but does not validate the DTD. DTD caching is always on, but certain conditions under which a cached DTD is used can be controlled.</p>
<b>5</b> Check the partner catalog to determine the appropriate document handler to run.	<p>Using user name and action type as a combined key, the Inbound Processor looks up the document handler element to be used in the partner catalog.</p> <p>The partner catalog is simply a table that lists users authorized to post documents to CS-Bridge XML. All entries in this database table must be registered users in Content Server. This mechanism matches users with actions that should be performed on their documents.</p>
<b>6</b> Process the document with the Document Handler.	<p>The Inbound Processor invokes the Document Handler and passes the DOM object (XML document in DOM format), password, user name, and action type to the handler for further processing.</p> <p>The particular handler called to process the document is one that you have written for that particular XML document. The complexity of the processing performed depends on the actions you need to take on the document.</p>
<b>7</b> Post the document to the outbound queue.	<p>The OutPost Handler places XML documents into the outbound queue.</p> <p>The Outbound Processor then takes documents from the outbound queue and posts them to a specified URL for processing.</p>

## Configuration Steps

CS-Bridge XML independently supports inbound and outbound document processing. To configure inbound document processing, follow these general steps:

1. Develop code to package and pass XML content, user name, password, and optional action type in the required format from your client application to the inbound document queue. Specifically, this information must be posted to a URL that initiates processing of this information by CS-Bridge XML.
2. Create document handlers, which perform whatever operations you require on XML documents submitted to CS-Bridge XML. A document handler is a Content Server XML or JSP element that CS-Bridge XML applies to a specified document. Depending on your requirements, you can create as many document handlers as you need.
3. Optionally use predefined tags that enable you to invoke the XML parser and XSLT processor from the document handler.
4. Configure the partner catalog, which associates user and action type combinations with a document handler.
5. Configure the event handler to schedule when documents in the inbound queue are processed.
6. Optionally set CS-Bridge XML properties that control DTD validation and caching.

Outbound processing requires simpler configuration, as follows.

1. Develop code to post the XML document to outbound queue. You can do this from a client application or from a document handler called by the inbound processor. Like the inbound document queue, you post the XML document to a Content Server URL that initiates processing of this information by CS-Bridge XML.
2. Configure the event handler to schedule when documents in the outbound queue are processed.

The “Processing XML Documents” chapter explains what you need to do to configure inbound and outbound processing for XML documents.





## Chapter 32

# Processing XML Documents

This chapter explains how to use CS-Bridge XML to receive XML documents from any source, process them, and optionally post them to a remote location. In particular, it explains required configuration steps that you need to follow to use the software.

Chapter sections cover the following topics:

- Authenticating Users
- Posting to the Inbound Queue
- Configuring the Partner Catalog
- Controlling DTD Validation and Caching
- Creating a Document Handler
- Posting to the Outbound Queue
- Configuring the Event Handler
- Using the XML Parser and XSLT Processor

## Authenticating Users

User authentication depends on prior creation of a user account in Content Server. Each document posted to CS-Bridge XML must be associated with a valid Content Server user name and password to be accepted into the inbound queue for processing. Your client program must package the user name and password in either of the following HTTP formats:

- HTTP query string

This method enables you to configure the partner catalog so that users can submit different documents and have different actions applied to them.

- HTTP basic authentication header

This method restricts each user to a single action type for all documents submitted to the inbound queue.

With either method, CS-Bridge XML checks the user name and password you pass against the Content Server database, as follows:

- If the user name password combination matches a corresponding pair in the Content Server database, the InPost Handler places the document in the inbound queue for processing.
- If the user name and password does not match a user registered in Content Server, the document is not allowed in the inbound queue, and the InPost Handler generates an error message or HTTP response with an error code.

## Passing User Name and Password in a Query String

In the post that contains the XML document, you can pass the user name and password associated with the document as name-value pairs in an HTTP query string.

Query string authentication is recommended when you need to configure the partner catalog to have multiple actions taken on different documents associated with a single user. Because the document action type is also passed using the query string method, the partner catalog can be configured for different user-name and action type combinations.

### Note

If you use HTTP basic authentication to pass the user name and password, only a single default action can be applied to the user's document. See the "Passing User Name and Password via Basic Authentication" section for more information.

User name and password are required parameters in the HTTP post that contains the XML document. When the document is submitted for processing, the InPost Handler checks the user credentials included in the post against the list of registered users. If the user exists and the corresponding password matches, the document is placed in the inbound queue.

User authentication depends on prior creation of a user account. Each user (or program) that will post documents to the inbound queue requires a user name and password.

## Query String Authentication Error Codes

CS-Bridge XML sets the HTTP response to an error condition when a document cannot be placed in the inbound queue. The following HTTP error codes denote different failures:

**Table 4:** Query String Authentication Error Codes

Error Code	Description
401 (Unauthorized)	Returns a request for user name and password.
412 (Precondition failed)	No action type is specified for the file.
500 (Internal Server Error)	Record could not be inserted into the database, or any other error occurred.

If the web server encounters an error before it passes control to CS-Bridge XML, the web server returns the appropriate response.

## Passing User Name and Password via Basic Authentication

CS-Bridge XML supports standard HTTP basic authentication for user authentication. Using basic authentication, you can pass an associated user name and password in an HTTP header, together with the XML document, to CS-Bridge XML.

Basic authentication is recommended for the following application scenarios:

- Basic authentication is the only method for passing user name and password to from your client application to CS-Bridge XML.
- A single default action is sufficient to be applied to the document.

In other words, you do not need to use the partner catalog to configure multiple actions to be taken on different documents associated with a single user. Because the action type is not included with basic authentication, CS-Bridge XML will use the default action type defined for the user. Because only one default action type can be assigned per user, only a single default element can be applied to any document posted by that user.

### Note

If you need to perform operations on different documents sent by the same user, you must pass the user name, password, and action type in a query string according to the instructions in the “Passing User Name and Password in a Query String” section and configure the partner catalog as described in the “Configuring the Partner Catalog” section.

## Constructing the HTTP Header

Basic authentication is the HTTP standard method of encoding user and password information to authenticate a client program. In basic authentication, the user name and a password are base-64 encoded and included in the `HTTP_AUTHORIZATION` header. If you choose to pass user name and password information in an HTTP header, you should know how to construct a header that contains this information. In addition, your client program must pass the header and document to CS-Bridge XML.

The HTTP header must contain user name and password coded according to RFC2617, the HTTP Basic Auth Specification. For more information, please refer to a publication that describes HTTP standards. The following sites, which explain the HTTP protocol and basic authentication, are a good place to start:

- For information about hypertext transfer protocol (HTTP):  
`http://www.w3.org/Protocols`
- For information about HTTP basic authentication standard RFC 2617:  
`http://www.w3.org/Protocols/rfc2616/rfc2616.html`

## Basic Authentication with CS-Bridge XML

CS-Bridge XML handles the user name and password in the post, as follows:

1. Your client program posts the user name and password in an HTTP header to the InPost Handler at the following URL:

```
http://host:port/servlet/ContentServer?pagename=OpenMarket/IC/
WebComm/PostHandler
```

For more information see the “Posting to the Inbound Queue” section.

2. The InPost Handler examines the HTTP\_AUTHORIZATION header, which contains the user name and password. Depending on the results, CS-Bridge XML takes one of the following actions:
  - If the user name and password is valid for Content Server, then the Inpost Handler decodes the user name and password and places the document in the inbound queue.
  - If the user name and password is specified but not valid, CS-Bridge XML sets the web server response to 403. For more information, see the “Basic Authentication Error Codes” section.
  - If the HTTP header is missing, CS-Bridge XML prompts the user with a Basic Authentication response:
    - a. Sets the Status Line to 401 Unauthorized.
    - b. Sets the WWW-Authenticate header to Basic.

In response, your client program should send a response with the username and password specified according to the HTTP specification.

3. The Inbound Processor executes the default document handler associated with the user. Because no action type is specified with basic authentication, you must specify a default document handler in the partner catalog. For more information, see the “Configuring the Partner Catalog” section.

## Basic Authentication Error Codes

CS-Bridge XML sets the HTTP response to an error condition when a document cannot be placed in the inbound queue. The following HTTP error codes denote different failures:

**Table 5:** Basic Authentication Error Codes

Error Code	Description
401 (Unauthorized)	Returns a request for user name and password.
403 (Forbidden)	Authorization failed because the password or username was invalid.
412 (Precondition Failed)	Error occurred reading file contents from the incoming stream.
500 (Internal Server Error)	Record could not be inserted into the catalog, or any other error occurred.

If the web server encounters an error before it passes control to CS-Bridge XML, the web server returns the appropriate response.

## Posting to the Inbound Queue

The remote system posts the XML document to a Content Server element called PostHandler using HTTP as the delivery mechanism. In addition to the XML file, the post must contain a user name, password, and possibly an action type. Follow the instructions for the type of user authentication scheme implemented.

### Posting to the Inbound Queue Using Query String Authentication

To post your user name, password, action type, and XML document as name-value pairs to the inbound queue, code your program as follows:

1. Pass the following parameters in HTTP post format:

Parameter	Value	Description
userName	Name of the user that will be posting XML documents to the inbound queue.	The value must be a valid user name (registered user) so that the request can be properly validated at the server.  Note that the parameter <code>userName</code> is intercapitalized. Be sure to use the exact spelling in your program code.
password	Password for the associated user name.	The value must be a valid password (registered for the user) so that the request can be validated at the server.
actiontype	A string, unique to the user, that identifies the element to be used to process the document.	For example: <code>actiontype=AddOrder</code> You associate the action type with an element, which in turn is associated with a user. Note that this relationship is defined in the partner catalog. The processing engine cannot process the document until this entry is made in the partner catalog.
file	XML document	Contains contents of the XML file to be processed.

2. Post the `userName`, `password`, `actiontype`, and `file` parameters to the InPost Handler at the following URL for WebLogic and WebSphere:

```
http://host:port/servlet/ContentServer?pagename=OpenMarket/IC/
WebComm/PostHandler
```

For the iPlanet application server, use the following URL:

```
http://host:port/NASApp/cs/ContentServer?pagename=OpenMarket/
IC/WebComm/PostHandler
```

After validating user and password, this element places documents in the queue. Specifically, it inserts the parameter and values contained in the post into the inbound catalog.

You can configure the Post Handler to run at particular time using the Event Handler. For more information, see “Configuring the Event Handler” on page 663.

## Example: Passing Parameters to the Inbound Queue

The following example HTML page for webLogic or IBM WebSphere is one way to post required parameters to the PostHandler element:

```
<HTML>
<BODY>
<h4>This form is used to post a document to InboundCatalog
table.</h4>
<FORM NAME="PostTest" METHOD="POST" ACTION="http://
<hostname:port>/servlet/ContentServer?pagename=OpenMarket/IC/
WebComm/PostHandler">
User Name : <INPUT type="text" name="userName" value="">
Password:  <INPUT type="text" name="password" value="">
ActionType:<INPUT type="text" name="actiontype" value="">
<BR>
File: <INPUT type="submit" name="submit" value="submit">
<BR>
<TEXTAREA rows="40" cols="80" name="file" value=" ">
</TEXTAREA>
</FORM>
</BODY>
</HTML>
```

## Posting to the Inbound Queue Using Basic Authentication

To post your user name, password, and XML document to the inbound queue, code your program as follows:

1. Ensure that your HTTP post includes the HTTP\_AUTHORIZATION header, which contains a user name and password that are registered with Content Server.
2. Include the contents of the XML document to be processed in the HTTP stream following the HTTP header.
3. Post the HTTP\_AUTHORIZATION header and XML file contents to the InPost Handler at the following URL:

```
http://host:port/servlet/ContentServer?pagename=OpenMarket/IC/
WebComm/PostHandler
```

After validating user and password, this element places documents in the inbound queue. Specifically, it extracts the information contained in the HTTP post and inserts it in the inbound queue database table.

You can configure the Post Handler to run at particular time using the Event Handler. For more information, see “Configuring the Event Handler” on page 663.

## Inbound Queue Error Handling

CS-Bridge XML captures status and errors that are generated as a result of posts to the inbound queue and places them in the inbound catalog database table. The following table lists possible status messages:

**Table 6:** Inbound Queue State Messages

State	Description
new	The post to the remote system was successful, and the document awaits processing.
done	Document was processed.
error_internal	An internal server error occurred, such as a problem reading from the database.
error_parsing	An error occurred while parsing the XML document. For example, the document was not well formed or did not comply with the supplied DTD.
error_doc_handler	The document handler threw an exception.
error_action_type	No corresponding entry was found in the partner catalog database table for the record.

To view status messages posted to the inbound queue:

1. Invoke the Content Server Catalog Tool.
2. From the list of database tables, select **InboundCatalog**.
3. Under the status field (**statusstr**), view messages.

## Configuring the Partner Catalog

The partner catalog is a Content Server database table that lists users who are authorized to process documents with CS-Bridge XML. The list matches users to the actions they are authorized to perform on the document. Because entries are valid for Content Server registered users only, you must create the user account beforehand. You supply the combination of user name and action type in the catalog, which provides the unique identification that determines the element to be applied to the document. Note that the partner catalog is not functional until you have created a Content Server element to handle the document. The Inbound Processor uses the partner catalog to determine the name of the Document Handler element to run. See “Creating a Document Handler” on page 658.

To edit the partner catalog, use either of these methods:

- Invoke CatalogTool.
- Invoke the following element:  
`/OpenMarket/IC/Sample1/WebComm/PCOperation`

(This element is only available if you chose to install the CS-Bridge XML sample code).

The partner catalog appears in the list as **PartnerCatalog Table**. To view the partner catalog without editing it, use CatalogTool or invoke the following element:

```
/OpenMarket/IC/Sample1/WebComm/DisplayTable
```

## Editing the Partner Catalog

The partner catalog determines which document handler element is used to process a document from a particular user:

- For query string user authentication, in which user name and password are supplied in the query string, each entry consists of the user name, action type, and element name for the document handler. Note that the combination of `userName` and `actiontype` must be unique.
- For basic user authentication, in which user name and password are supplied in the HTTP header, each entry consists of the user name, default action type, and element name for the document handler. Note that there can be only one default action type per user.

If necessary, the partner catalog can be configured to support separate client programs that use different types of user authentication. The `default` action type applies to all documents submitted by a single user. Consider the following partner catalog, which is made up of two users with different action types, as follows:

User Name	Action Type	Element Name for Document Handler
User 1	Action A	OpenMarket/XMLExchange/ PLACEORDER
User 1	Action B	OpenMarket/XMLExchange/ TRANSFORM
User 2	Action A	OpenMarket/XMLExchange/ EDITORDER
User 2	Action M	OpenMarket/XMLExchange/ PLACEORDER
User 2	default	OpenMarket/XMLExchange/ TRANSFORM

For three documents associated with different action types that are posted by User 1 and User 2:

- If User 1 posts a document with action type specified as Action A, then the `PLACEORDER` element is invoked and applied to the document.
- If User 1 posts the same or a different document with action type specified as Action B, then the `TRANSFORM` element is applied to the document.
- If User 2 posts a document with action type specified as Action M, the same `PLACEORDER` element is applied to the document.



- If User 2 authenticates using basic authentication and posts a document with no action type specified, CS-Bridge XML looks for the `default` action type for that user, and applies the TRANSFORM element to the document.

## Controlling DTD Validation and Caching

DTDs (document type definitions) either reside in an external location specified by a URI (universal resource identifier) or are embedded directly in the XML document. The Inbound Processor, which presents the document to the XML parser for validation, also caches external DTDs. DTDs embedded in the XML document are not cached.

You can turn these functions off or on by setting the Content Server properties that control them. By default, DTD validation is turned off, and DTD caching options are turned on.

### Controlling DTD Validation

To improve performance, or for any other reason, you can turn DTD validation off. Whatever option you choose affects all documents submitted to the system. If you turn DTD validation off, the XML parser still checks that incoming documents contain well formed XML.

1. Invoke the Property Editor.
2. Edit the `xmles.ini` file.
3. Look for the `wc.validate` property and enter a value to enable or disable use of the DTD validation function.

Property Name	Values	Description
wc.validate	true	Set to true, enables the XML parser to validate DTDs associated with documents submitted to CS-Bridge XML.
	false	Set to false, turns off the DTD validation function so that no DTDs are validated for submitted documents.  The default value is false.

### Controlling DTD Caching

Caching improves performance for external DTDs because DTDs are stored locally in a DTD catalog. Therefore, the system does not need to retrieve the DTD from a remote site or system. The first time a DTD is referenced it is retrieved from the remote source and stored in the DTD catalog. Each subsequent time a document is processed, the system date for the external DTD is compared to the date for the cached copy. If the DTD has changed, CS-Bridge XML returns the latest version to cache.

CS-Bridge XML requires that DTD names referenced by inbound XML documents must be unique on the local and remote systems.

Although caching is always on, you can control whether or not the cached DTD is used if the machine that contains the DTD cannot respond to the DTD request. A property in the

`xmles.ini` file determines whether CS-Bridge XML uses the cached copy when the system that stores the DTD is down.

1. Invoke the Property Editor.
2. Edit the `xmles.ini` file.
3. Look for the `wc.enableCacheRet` property and enter a value to enable or disable use of the cached DTD when the remote system cannot return a DTD.

Property Name	Values	Description
<code>wc.enableCacheRet</code>	True False	Set to <code>True</code> , allows the DTD to be returned from cache when the remote system is down. The default value is <code>True</code> .  Set to <code>False</code> , returns control to the XML parser. The XML parser requests the DTD once again. If no DTD is returned, an error is recorded in the inbound queue.  The default value is <code>true</code> .

## Flushing the DTD Cache

Cached DTDs are stored in a DTD catalog. Deleting a DTD name in the catalog requires that you delete the entire chain of associated DTDs.

1. Invoke the CatalogTool.
2. Edit the catalog called `dtdcatalog`.
3. Determine whether the DTD is part of a chain by looking at the `unqid` field in the `dtdcatalog`. DTDs in the same chain will have the same value for the `unqid` field.
4. Delete the DTD chain.

## Creating a Document Handler

Actual document processing is completed by the Document Handler, which is a Content Server element you create. The Document Handler performs whatever operations you require on XML documents submitted to CS-Bridge XML.

Create the Document Handler as you would any Content Server element. You can use the full coding capabilities of Content Server, including JSP and XML. Support for JSP makes it possible to use Java classes and Enterprise Beans. Keep in mind that because JSP code is compiled rather than interpreted, Web sites developed with JSP outperform Web sites developed with XML.

Control over processing can involve multiple logic elements, as needed. The complexity of your processing depends on your application. A simple task, such as storing the content of the document, requires minimal processing. A more complicated task, such as converting order form data to a shopping cart, requires more extensive processing.

The XSLT engine shipped with the product, which performs document transformations, can be invoked from the Document Handler. Refer to the Xerces XML parser and Xalan

XSLT engine documentation supplied with CS-Bridge XML. If necessary, you can program your Document Handler to invoke further processing.

Create as many document handlers as you need to service different types of documents. The Inbound Processor automatically invokes the Document Handler based on entries in the partner catalog.

## Example: Document Handler Element

Elements are essentially smart templates containing the logic to react to changing data. For example, elements can display different data for different visitors. Or you can set up the elements to react to changing information in databases, to the current time of day, or to the values of input variables.

The following sample element is configured to be invoked by the Inbound Processor:

```
<%@ taglib prefix="cs" uri="futuretense_cs/ftcs1_0.tld" %>
<%//
//
// INPUT
//
// OUTPUT
//%>
<%@ page import="COM.FutureTense.Interfaces.*" %>
<%@ page import="COM.FutureTense.Util.ftMessage"%>
<%@ page import="COM.FutureTense.Util.ftErrors" %>
<%@ page import="org.w3c.dom.Document" %>
<%@ page import="org.apache.xml.serialize.OutputFormat" %>
<%@ page import="org.apache.xml.serialize.Serializer" %>
<%@ page import="org.apache.xml.serialize.SerializerFactory" %>
<%@ page import="org.apache.xml.serialize.XMLSerializer" %>
<%@ page import="java.io.*" %>

<cs:ftcs>

<%
    // Sample element

    String userName = ics.GetVar("username");
    String actionType = ics.GetVar("actiontype");
    String password = ics.GetVar("password");
    Document doc = (Document) ics.GetObj("Document");

    OutputFormat format = new OutputFormat( doc ); //Serialize
DOM
    StringWriter stringOut = new StringWriter();
    XMLSerializer serial = new XMLSerializer( stringOut,
format);
    serial.asDOMSerializer();
    serial.serialize( doc.getDocumentElement());

    out.println("<br />");
    out.println("UserName : " + userName);
    out.println("<br />");
```

```

        out.println("ActionType :" + actionType);
        out.println("<br />");
        out.println("Password :" + password);
        out.println("<br />");
        out.println("XML Doc = " + stringOut.toString() );
    %>
</cs:ftcs>

```

## Posting to the Outbound Queue

Independent of any inbound processing steps, the outbound queue enables you to post documents to a URL of your choice, for display or further processing. The outbound queue is a Content Server catalog that contains information to be included in the post, such as user name, password, URL components, optional action type, and the XML content. All information included in the post is sent to the destination URL specified in the post.

Using the outbound queue, you can send an XML document in response to the document received or in response to some other internal or external event, for example, a receipt in response to an order. Like the inbound queue, this catalog contains records that point to documents in the file system. The Outbound Processor, which is responsible for sending documents, can be run manually or set to run on a timed schedule.

A remote system, or your inbound Document Handler program, posts XML documents to the OutPost Handler using HTTP as the delivery mechanism. You post documents to the outbound queue by running the WriteToOutQ element. In addition to the XML file, the post must contain user name, password, action type, host name, and partial URL. The Outbound Processor is invoked by running the OutQHandler element. It posts documents waiting in the outbound queue to the remote URL.

To post to the outbound queue and remote URLs, code your program as follows:

1. Pass the following parameters in HTTP post format:

Parameter	Value	Description
userName	Name of the user that will be posting XML documents to the remote URL.	The value should be a valid user name (registered user) for the remote system or for Content Server if you are posting to the Inbound Queue. That way, the request can be properly validated at the server.  Note that the parameter <code>userName</code> is intercapitalized. Be sure to use the exact spelling in your program code.
password	Password for the associated user name.	The value should be a valid password (registered password) for the remote system or for Content Server if you are posting to the Inbound Queue. That way, the request can be properly validated at the server.

Parameter	Value	Description
actiontype	Up to three name=value pairs separated by semicolons (;).	<p>Some examples:</p> <pre>name1=val1;name2=val2;name3=val3</pre> <pre>company=FatWire</pre> <pre>pagename=&lt;element&gt;</pre> <p>For example, for the following Content Server URL in the postadd column:</p> <pre>/servlet/ContentServer</pre> <p>You would enter the following name=value pair in the actiontype column:</p> <pre>pagename=xyz</pre> <p>Actiontype is optional and possibly irrelevant if you are posting to a remote system. In that case, the variables are available to pass any information you choose.</p> <p>If you are posting back to the inbound queue, the actiontype should correspond to some entry in the partner catalog. The Inbound Processor cannot process the document until this entry is made in the partner catalog.</p> <p>Do not include a query string (name=value pair) in the URL.</p>
hostname	<p>Name of the host for the remote system where the document is to be posted. For example:</p> <pre>hostname:port</pre> <p>If no port number is specified, the default port on the remote system is used.</p>	Note that the complete URL is formed from a combination of the the hostname and postadd parameters.
postadd	URL without a query string, indicating the location to post the document.	Note that the complete URL is formed from a combination of the the postadd and hostname parameters.
file	XML document contents	Contents of the XML file to be processed.
filename	XML document name	Name of the XML file to be processed. Specify any suitable name.

2. Post the `userName`, `password`, `actiontype`, `hostname`, `postadd`, `file`, and `filename` parameters to the OutPost Handler at the following URL:

```
http://host:port/servlet/ContentServer?pagename=OpenMarket/IC/
WebComm/WriteToOutQ
```

This element places documents in the queue without performing user authentication. Specifically, it inserts the parameter and values contained in the post into the outbound catalog. Although the user name and password are passed as parameters, they are not checked against registered users.

3. Run the Outbound Processor element to post the XML document and associated parameters to the specified host and URL.

```
http://host:port/servlet/ContentServer?pagename=OpenMarket/IC/
WebComm/OutQHandler
```

Note there is no validation done for the values of above arguments posted to the remote site. If needed, validation is performed by the receiving program at the remote site.

You can configure the Outbound Processor to run at particular time using the Event Handler. For more information, see "Configuring the Event Handler".

## Passing Parameters to the Outbound Queue

The following example demonstrates how to pass parameters to the outbound queue:

```
<html>
<head>
  <title>OutQPoster</title>
</head>
<h4>This form is used to post document to OutboundCatalog table.</
h4>
<FORM NAME="PostTest" METHOD="POST"
ACTION="/servlet/ContentServer?pagename=OpenMarket/IC/WebComm/
WriteToOutQ">
User Name: <INPUT type="text" name="userName" value=""/>
Password: <INPUT type="text" name="password" value=""/>
<BR/>
Host Name: <INPUT type="text" name="hostname" value=""/>
Post Address: <INPUT type="text" name="postadd" value=""/>
<BR/>
Action Type: <INPUT type="text" name="actiontype" value=""/>
<BR/>
File Name: <INPUT type="text" name="filename" value=""/><BR/>
File: <INPUT type="submit" name="submit" value="submit"/>
<BR/>
<TEXTAREA rows="40" cols="80" name="file" value=""/>
</FORM>
</html>
```

## Outbound Queue Error Handling

CS-Bridge XML captures status and errors that are generated as a result of posts to the outbound queue and places them in the outbound catalog database table. The following table lists possible status messages:

**Table 7:** Outbound Queue Status Messages

Status Message	Description
200 OK	Indicates that the post to the remote system was successful.
Too many arguments	The <code>actiontype</code> field contains more than three <code>name=value</code> pairs.
Argument format incorrect	The <code>actiontype</code> field is not in the following form: <code>name1=val1;name2=val2;name3=val3</code>
<i>error_code</i>	If an HTTP error code is returned in an HTTP response, the status field of the record is set to the numeric value of the HTTP code, including associated message text.

To view status messages posted to the outbound queue:

1. Invoke the Content Server Catalog Tool.
2. From the list of database tables, select **OutboundCatalog**.
3. Under the status field (**statusstr**), view messages.

## Configuring the Event Handler

The Event Handler controls when other elements, including the Inbound Processor and the Outbound Processor, are invoked. Use this element to schedule when documents in the inbound queue and outbound queues are processed. To do this, you configure Event Handler parameters that determine when the specified queue is polled.

To configure the Event Handler, code your program as follows:

1. Create an HTTP post that contains the following name/value pairs:

Name	Value	Description
eventName	Name of the event you want to create.	Select a unique name for the value. Names that are not unique will cause an error.  Do not use special characters in the event name, such as "{", "*", or "&."
pageToRun	Name of the element to invoke at the specified time interval.	To set a time to run the Inbound Processor, specify the following element: OpenMarket/IC/WebComm/ProEngine  To set a time to run the Outbound Processor, specify the following element: OpenMarket/IC/WebComm/OutQHandler
timeString	Time at which you want the element to be invoked.	Use the following time format: hh: mm: ss W/DD/MM  Fields indicate hours (hh), minutes (mm), and seconds (ss): hh: 0-23 mm: 0-59 ss: 0-59  Values for day of the week (W), date (DD), and month (MM): W: 0-6 Note that 0=Sunday. DD: 1-31, MM: 1-12  For each of these values, asterisks (*) and commas to separate a list of values are valid characters. A value can be one or more numbers separated by a hyphen (-) to indicate an inclusive range. For example, for time = 2,5-7 :0:0 5/*/*  the element will be invoked every day at 2 A.M, 5 A.M., 6 A.M., and 7 A.M. every Friday.  Specify days by two fields: day of the week (W) and day of the month (DD). If both are specified, both take effect. For example, for time 1:0:0 1/15/*  the element will be invoked at 1 A.M every Monday, and on the fifteenth of each month. To specify days by a single field, set the other field to an asterisk (*).



2. Post the `eventname`, `pageToRun`, and `timeString` parameters to the URL for the `EventHandler` element:

```
http://host:port/servlet/ContentServer?pagename=OpenMarket/IC/
WebComm/EventHandler
```

## Example: Passing Parameters to the Event Handler

The following sample JSP code, which includes syntax to call a Content Server element running on WebLogic or WebSphere, passes the required parameters to the `EventHandler` element and specifies a time to check the inbound queue.

### Note

Javadoc reference documentation for CS-Bridge XML is available in the following directory:

```
install_dir/FutureTense/futuretense_cs/Docs/iCentre/
javadoc/public
```

```
<%@ taglib prefix="cs" uri="futuretense_cs/ftcs1_0.tld" %>
<%//
// OpenMarket/IC/XMLExchangeSvr/PostTest
//
// INPUT
// OUTPUT
//%>
<%@ page import="COM.FutureTense.Interfaces.*" %>
<%@ page import="COM.FutureTense.Util.ftMessage"%>
<%@ page import="COM.FutureTense.Util.ftErrors" %>
<cs:ftcs>
```

<h4>The following form is used to set `EventHandler` to run an element at certain time.</h4>

```
<FORM NAME="EventHandler" METHOD="POST"
ACTION="/servlet/ContentServer?pagename=OpenMarket/IC/
XMLExchangeSvr/EventHandler">
```

```
<table>
<tr><td>Event Name:</td><td>
<INPUT type="text" name="eventname"
value=""></td></tr>
<tr><td>Element To Run:</td><td>
<INPUT type="text" name="pageToRun"
value=""></td></tr>
<tr><td>Time:</td><td>
<INPUT type="text" name="timeString"
value=""></td></tr>
</table>
```

<I>Note: Time Format should be hh:mm:ss W/DD/MM where hh: 0-23, mm:

```
0-59, ss: 0-59<br /> W(day of the week): 0-6 with 0=Sunday, DD:1-31,  
MM:1-12<br />  
e.g. For Time = "13:10:00 */*/*", event will be invoked every day  
at  
1:10 pm</I><br />  
  
<INPUT type="submit" name="submit" value="submit">  
</FORM>  
</cs:ftcs>
```

## Using the XML Parser and XSLT Processor

CS-Bridge XML includes the Xerces XML parser and the Xalan XSLT processor from Apache (<http://www.xml.apache.org>). CS-Bridge XML relies on the XML parser to verify that XML documents are well formed and that associated DTDs are valid. Additional capabilities of these products are at your disposal, for example:

- Xerces XML parser provides an implementation of the DOM interface to manipulate DOM objects. DOM is used for CS-Bridge XML because it is the preferred interface for accessing and updating the content and structure of documents, particularly those with complex DTDs.
- Xalan XSLT processor is available for transforming XML documents into HTML, PDF, XHTML, or other XML document types.

### Note

For more information, refer to the Java doc supplied with CS-Bridge XML for the Xerces and Xalan products.

## Section 7

# Web Services

This section explains how to integrate Content Server with any client application that has a SOAP interface.

It contains the following chapters:

- Chapter 33, “Overview of Web Services”
- Chapter 34, “Creating and Consuming Web Services”



## Chapter 33

# Overview of Web Services

This chapter introduces web services and explains how they work with Content Server. It describes what is supplied.

This chapter contains the following sections:

- What Are Web Services?
- SOAP and Web Services
- Supported SOAP Version
- Supported WSDL Version
- Related Programming Technologies

As a standard part of the CS-Direct product, web services require no additional installation or configuration.

## What Are Web Services?

Content Server enables you to create, deploy, and publish your own web services, as well as consume web services from other applications. Web services, which are a collection of operations that are accessible via standard XML messaging over the Internet, enable data exchange independent of the programming language, operating system, or hardware used by a given target system. With regard to Content Server, web services provide a standard means to expose content and functionality for consumption by remote applications, including ERP (enterprise resource planning), CRM (customer relationship management), portal, and commerce systems.

## SOAP and Web Services

Integration between Content Server and other applications is accomplished by transforming data using HTTP and XML data formats. The key XML format for web services is SOAP (Simple Object Access Protocol). SOAP is a W3C specification that extends HTTP to enable distributed applications to make remote-procedure calls (RPCs) over the Internet. As a language, SOAP defines the XML elements used to describe the parameters, return values, and so on required for RPC-style interactions. SOAP messages are transmitted point-to-point and handled in request-and-response fashion. Content Server, which supports SOAP, can exchange data with any application that has a SOAP interface. When processing SOAP requests, Content Server leverages its native support for XML and its efficient page-evaluation and delivery mechanisms.

## Supported SOAP Version

Content Server supports SOAP 1.1. You will need to know the capabilities and limitations of the SOAP protocol to write web services for Content Server. SOAP standard syntax is described in detail at the W3C web site:

<http://www.w3.org>

## Supported WSDL Version

WSDL (web services description language) is an XML format that describes distributed services on the Internet. A WSDL file describes the location of the service and the data to be passed in messages for particular operations. With regard to Content Server, these messages contain procedure-oriented information.

Content Server 5.5.1 supports WSDL 1.1. You will need to understand the web services description language to write web services for Content Server and use the predefined WSDL files shipped with Content Server. The SOAP standard syntax is described in detail at the following W3C web site:

<http://www.w3.org/TR/wsdl.html>

For complete information about the WSDL files supplied with Content Server, refer to the *CSEE Web Services Reference*.

## Related Programming Technologies

To write web services for Content Server, you should have a basic understanding of some or all of the following related technologies:

- XML
- SOAP
- WSDL
- JSP
- Java

- J2EE (Java 2 Enterprise Edition)
- .Net





## Chapter 34

# Creating and Consuming Web Services

This chapter explains how to integrate Content Server with remote applications over the Internet using web services protocols. In the context of the Content Server development framework, it teaches you how to create and consume basic web services.

This chapter contains the following sections:

- Using Predefined Web Services
- Creating Custom Web Services
- Consuming Web Services

## Using Predefined Web Services

Content Server includes a complete array of asset-delivery functions implemented as web services. These services can be accessed by any technology that can produce a web-services-enabled client. Supplied web-service capabilities are comparable to existing Content Server APIs (XML, JSP, Java, and COM).

Each supplied service is represented by a predefined WSDL (web services description language) file that contains descriptions of multiple web-services operations. Individual WSDL files define the interface and methods for web-services operations that correspond to Content Server functions. Related operations are grouped and collectively described according to function.

The WSDL file is used to generate the code required to interact with Content Server from a client application. You can generate client code automatically using various third-party applications that read WSDL files, or manually by examining the WSDL description and writing the client code from scratch. The resulting client stub constitutes a suitable interface for interaction with Content Server. When executed, the code creates a SOAP request based on the WSDL operation.

Most times you will have control over the client interaction with Content Server. For access by potentially unknown client applications, however, the supplied WSDL files can also be posted to a URL and registered via UDDI (universal description, discovery, integration) for remote access.

### Accessible Information

Any web services client that supports SOAP and follows the predefined WSDL specifications can access the following information from the Content Server database:

- Site map of a Content Server site
- Blob data, such as a PDF file
- List of all the valid asset types and asset subtypes at a Content Server site
- List of assets that match specified search criteria
- Metadata associated with a particular asset

#### Note

For complete information about WSDL files, supported operations, and required inputs, refer to the *CSEE Web Services Reference* manual.

### WSDL File Location

Predefined WSDL files for Content Server are automatically installed with the CS-Direct application in the following location:

```
http://install_dir/futuretense_cs/Xcelerate/wsd1/*.wsdl
```

## Process Flow

The following general steps describe how a request from a web services client program is processed using a supplied WSDL file:

1. The supplied WSDL file includes a description of the format for the request (input data expected by Content Server) and the format for the return data. The WSDL file maps standard data types for applications written in Java, Visual Basic, or other programming languages to XML schema data types.
2. The client program uses instructions in the WSDL to transform data from an input source (for example, a structured file) to an XML schema that is consistent with what the Content Server web service interface expects.
3. The client generates a SOAP envelope that includes the required data and transmits it to the Content Server site.
4. Content Server receives the SOAP message.
5. An XML parser and transformation utility map the data in the SOAP message to the format required by Content Server.
6. Content Server invokes the appropriate CS-Direct seed classes.
7. Seeds invoke the specified Content Server action.
8. Content Server returns requested data (name/value pairs) in the output format defined by the WSDL file to the client application.
9. The SOAP processor for the client application maps the XML schema data types to native data types for the specific programming language used.

## Consider Your Data

Data for the predefined WSDL operations is passed using RPC-style interactions (versus exchanging entire XML documents) to your program. Data types for all possible inputs for the predefined web services are described in the *CSEE Web Services Reference* manual. These are mostly strings, but Content Server also includes classes that handle native objects with complex data types; for example, SearchStates and ILists.

## Generating the Client Interface

Use the WSDL files to generate an interface for your client application. A variety of tools that generate client code from WSDL files are available. These tools support output for different programming languages. Choose a tool that produces code in the target language for your client application, and run it on the WSDL file that describes the operations you need. The resulting client stub makes all Content Server operations available to your client program.

## Writing Client Calls

The code generated from the WSDL file provides an interface to Content Server functions. Once available, you can call the functions from your application, as needed. These functions, including Java example code, are described in the *CSEE Web Services Reference* manual.

## Creating Custom Web Services

With Content Server, you can create web services that map data from any Content Server functions that you want to expose. Because of its support for XML, Java, and JSP, the existing Content Server development environment provides a familiar platform for developing web services. A supplied tag set enables you to build a SOAP response and stream SOAP encapsulated data to and from applications. As with the prepackaged web services, the Content Server delivery capability and page-evaluation pipeline are used to process SOAP requests. For web services, the client is a program, not a browser.

To create a custom web service, follow these general steps:

1. Consider Your Data
2. Creating a Content Server Page
3. Writing a Content Server Element
4. Creating a WSDL File

### Process Flow

The following general steps describe how a request from a web services client program is processed:

1. The client program wraps whatever inputs are required in SOAP and passes them to Content Server.
2. The client uses instructions in the WSDL file to transform data from an input source (for example, a structured file) to an XML schema that is consistent with what the Content Server web service interface expects.
3. The client generates a SOAP envelope that includes the required data and transmits it to the Content Server site.
4. Content Server receives the SOAP message.
5. An XML parser and transformation utility map the data in the SOAP message to the format required by Content Server.
6. Content Server invokes the appropriate CS-Direct seed classes.
7. Seeds invoke the specified Content Server action.
8. Content Server returns requested data (name/value pairs) in the output format defined by the WSDL file to the client application.
9. SOAP processor for the client application maps the XML schema data types to native data types for the specific programming language used.

### Consider Your Data

Data is passed using RPC-style interactions (versus exchanging entire XML documents) to your program. Consider your data and verify that you will be dealing with simple XSI data types. Content Server supports all W3C XSI primitive data types without modification.

**Note**

Support for complex web-services data types is possible in Content Server but requires that you create your own Java classes and deploy them on the application server. If you plan to create your own data types, FatWire recommends that you consult with CSEE technical support before doing so.

## Creating a Content Server Page

Each web service requires page entry in the `SiteCatalog` table. The page entry to the `SiteCatalog` is a name that points to the element that calls the Content Server function described by your web service. The `SiteCatalog` stores all valid entries for pages at your site, including those that invoke web services.

The page is invoked by a request from the client. In turn, the response from Content Server is encapsulated in SOAP and returned to the client. Remember that for web services the client is a program (instead of a browser), and the response is XML (instead of HTML).

### To create a Content Server page for web services:

1. Enter the location of the element for your client function in the `SiteCatalog` table.
2. Start Content Server Explorer and log in to Content Server. For instructions, refer to the online help or the instructions in this guide.
3. In the left pane, open the `SiteCatalog` table.
4. Select the folder for your site.
5. In the **pagename** field, create an entry for the last part of the page name for your web service in the `SiteCatalog` table.
6. In the **root element** field, create a root entry for your web service. (Including the `SiteCatalog` entry in the `SiteCatalog` root avoids a table lookup and ensures that the element name of the first child element is mapped to the specified pagename.)
7. In either of the **resargs** fields, add the following optional arguments, if appropriate:
  - `cs.session=false` bypasses application server session management for the life of the SOAP request without using existing session objects or creating new session objects on behalf of the current request. This improves performance by reducing the application server load for native requests and requests from clients that do not require session persistence. Although supported on any page, the `cs.session=false` resarg is mainly intended for use with SOAP services.
  - `cs.contenttype=text/xml` prepares the root element for processing. Specifically, it causes the XML engine to properly respect namespace on tags and prevents default HTML compression from occurring. This is required only if you expect the request to come through a browser. Unless the web services request is always received as a SOAP request, you must include this resarg in each `SiteCatalog` entry to override the HTML compression. Provided that your input XML is well formed, you can be sure that the content output will be proper XML.
8. In the **csstatus** field, enter `Live`, or the appropriate status at this time.
9. Choose **File > Save All**, or click the **Save All** toolbar button to save your work.

## Writing a Content Server Element

The Content Server element contains the code for the function you want to expose. The element handles data and formats the SOAP response. To format the SOAP response, include the SOAP XML tags supplied with Content Server in your code. Content Server automatically generates the XML for the SOAP envelope.

Content Server elements written for web services in XML and JSP must not contain extra whitespace or comments because, unlike HTML, XML and its SOAP implementation have stricter parsing requirements. Because XML and JSP pages are handled the same way as HTML pages and are not filtered by Content Server, extra whitespace or comments can corrupt the SOAP message. Keep in mind that although comments are removed when the `XMLdebug` property is turned off, extra whitespace can still corrupt the XML stream. Comments (XML or JSP) should appear only after the `soap.message` tag.

### To write an element for a web service:

1. Start Content Server Explorer and log in to Content Server (if you have not already done so). For instructions, refer to the online help or this guide.
2. In the left pane, select and highlight the `ElementCatalog` table.
3. Create a new folder in the `ElementCatalog` table: choose **File > New Folder**.
4. Select and highlight the new folder, and right-click anywhere in the right pane and select **New** from the pop-up menu.

A new row appears in the table.

5. In the **elementname** field, enter an appropriate name for your web service as the name of the element.
6. In the **description** field, enter a short description of the element.
7. Click in the **url** field, and click the button that appears.

The **New File** dialog box appears.

8. In the **Type/Ext** field, select **XML** or **JSP** as the file type from the drop-down list.
9. Click **OK**. Content Server Explorer opens its default editor. Content Server creates a file containing the skeleton code required of all XML or JSP elements. Enter your element code, including the required Content Server SOAP tags. For example, you can use the following code for XML:

```
<?xml version="1.0" ?><!DOCTYPE FTCS SYSTEM
"futuretense_cs.dtd">
<FTCS Version="1.2">
<!-- WebServices/helloworld
-
- INPUT
-
- OUTPUT--->
<soap.message ns="mynamespace">
    <soap.body tagname="HelloWorldOut">
        <echoStringOut xsi:type="xsd:string">
            <csvar NAME="Variables.echoString"/>
        </echoStringOut>
    </soap.body>
```

```
</soap.message>
```

```
</FTCS>
```

10. Choose **File > Save All** to save your work.

#### Note

Choosing **File > Save** instead of **File > Save All** saves your file, but does not make it available to the application server.

## Creating a WSDL File

WSDL (web services description language) files describe the web service so that a basic web services client can be automatically generated based on information it contains. If you are not using the predefined services provided with Content Server, you can optionally create your own WSDL file to describe your web service.

A WSDL file includes the SOAP address, SOAP action, a description of the format for the request (input data expected by Content Server), and the format for the return data. The WSDL file maps standard data types for applications written in Java, Visual Basic, or other programming languages to XML schema data types. Use any of the predefined WSDL files for Content Server functions as a template to get started.

## Writing WSDL File Elements

A WSDL file has four sections:

- **Types** - specifies the data format and schema definition for operations. The type correlates with return data.
- **Message** - names inputs and outputs. This describes what the Content Server page must send back.
- **Operation** - describes inputs and outputs.
- **Binding** - specifies the SOAP action and operations.
- **Service** - describes associated port and binding with a URL.

In these sections, specify the following key XML elements:

- target namespace
- service name
- port name
- operation name
- input parameters (corresponding to simple data types) for the operation. Simple XSI data types (string, integer, float, and so on) return a single value.

## WSDL File Example

Each WSDL file is a collection of interrelated operations, logically grouped together according to their Content Server function. Completed web services return XML in the form of a SOAP encapsulated response. You will need to understand web services description language to write web services for Content Server. Content Server 5.5.1 supports WSDL 1.1.

```

<?xml version="1.0" encoding="utf-8"?>
<definitions xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" xmlns:s="http://
/www.w3.org/2001/XMLSchema" xmlns:s0="http://FatWire.com/someuri/"
xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:tm="http://microsoft.com/wsdl/mime/textMatching/"
xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"
targetNamespace="http://FatWire.com/someuri/" xmlns="http://
schemas.xmlsoap.org/wsdl/">
  <types>
  </types>
  <message name="HelloWorldIn">
    <part name="echoString" type="s:string"/>
  </message>
  <message name="HelloWorldOut">
    <part name="echoStringOut" type="s:string"/>
  </message>
  <portType name="HelloWorldPortType">
    <operation name="helloworld">
      <documentation>FOR LATER</documentation>
      <input message="s0:HelloWorldIn"/>
      <output message="s0:HelloWorldOut"/>
    </operation>
  </portType>
  <binding name="HelloWorldBinding" type="s0:HelloWorldPortType">
    <soap:binding transport="http://schemas.xmlsoap.org/soap/
http" style="rpc"/>
    <operation name="helloworld">
      <soap:operation soapAction="WebServices/" />
      <input>
        <soap:body use="encoded"/>
      </input>
      <output>
        <soap:body use="encoded"/>
      </output>
    </operation>
  </binding>
  <service name="HelloWorld">
    <port name="HelloWorldPort" binding="s0:HelloWorldBinding">
      <soap:address location="http://localhost:8080/servlet/
ContentServer"/>
    </port>
  </service>
</definitions>

```



## Consuming Web Services

Content Server can interact with any remote application that offers a web service and that returns a data type supported by the XML Schema.

Using the information contained in the WSDL file for a given web service, you use a supplied Content Server invocation tag to specify the location of the web service, the operation to invoke, and the name of the object in which the return data is to be stored. An associated parameter tag specifies the input parameters for the particular operation.

Once the data is transmitted and stored in Content Server, it becomes available for display or further processing. Content Server pages or APIs handle the return data according to your custom business logic. By configuring the web service as a tag, Content Server handles data as if it were an ordinary content tag for a native Content Server function.

If you are not using a tool that automatically creates the client, you need to read the WSDL file and write your code by hand. Note that for automated client generation, the output language of the client depends on the tool you select.

### Locating the Web Service

The web service description should be in WSDL format. If you are not given the location of the WSDL, you may need to search for the web service via UDDI in a web services directory.

### Gathering Information from the Remote WSDL File

Enter the URL of the WSDL file in a browser and view its contents. The WSDL file defines a service and port for each of one or more operations. Depending on the WSDL, you may see multiple operations that correspond to multiple servers, or multiple operations that correspond to a single server.

In the WSDL, look for the following XML elements and record their values:

- target namespace
- service name
- port name
- operation name
- input parameters (corresponding to simple data types) for the operation. Simple XSI data types (string, integer, float, and so on) return a single value.

### Providing Information to Content Server

Information about the remote web service that is contained in the WSDL file is transmitted to Content via SOAP tags, which you configure.

**To create a Content Server page and element that includes SOAP tags:**

1. Create a Content Server page and element.

2. In the element, include the following SOAP tags:
  - a. For the `webservices:invoke` tag, set parameters for the target namespace, service name, and port name for the web service. Also set the `object` parameter, which specifies the name of the object that will contain the return data.
  - b. For the `webservices:parameter` tag, set parameters that represent inputs for the web service operation.

## SOAP Tag Example

The following element includes the the Content Server SOAP tags for consuming web services:

```
<webservices:invoke
  wsdl="http://soapinterop.java.sun.com/round2/base?WSDL"
  target="http://soapinterop.org/"
  service="Round2Base"
  port="RIBaseIFPort"
  operation="echoString"
  object="echostringjsp">
  <webservices:parameter type="string" value="hello world jsp"/>
</webservices:invoke>
<%=ics.GetObj("echostringjsp")%>
```

## Section 8

# CS-Engage

This section describes how to use CS-Engage to design an online site that gathers information about your site visitors and customers and to then use that information to personalize the information that is displayed for each visitor.

It contains the following chapters:

- Chapter 35, “Creating Visitor Data Assets”
- Chapter 36, “Recommendation Assets.”
- Chapter 37, “Coding CS-Engage Pages”



## Chapter 35

# Creating Visitor Data Assets

CS-Engage lets you design online sites that gather information about your site visitors and customers, and then to use that information to personalize the product placements and promotional offerings that are displayed for each visitor.

Customizing your online sites begins with visitor data. The definitions of visitor data types are treated as assets in the CSEE database. There are three kinds of visitor data assets: visitor attributes, history attributes, and history types.

This chapter describes the visitor data assets and presents procedures for creating them. It contains the following sections:

- About Visitor Data Assets
- Creating Visitor Data Assets
- Verifying Your Visitor Data Assets
- Approving Visitor Data Assets

## About Visitor Data Assets

You create visitor data assets so that you can use them to group your site visitors into segments. There are three kinds:

- Visitor attributes
- History attributes
- History types

When you create visitor data assets, you create entries in the visitor data tables in the CSEE database and you reserve a place in the database to store information of that kind for your site visitors.

## Visitor Attributes

Visitor attributes hold types of information that specify one characteristic only (scalar values). For example, you can create visitor attributes named “years of experience,” “job description,” or “number of children.”

When the visitor changes the data, the new data overwrites the old data. CS-Engage does not assign a timestamp to the data that is stored as a visitor attribute and does not store revisions. For example, if a visitor changes his entry for “job description” from “butcher” to “baker,” the information that the visitor was once a butcher is overwritten. You cannot, for example, create a segment based on bakers who used to be butchers.

For historical data, you must use history types.

## History Attributes and History Definitions

**History attributes** are individual information types that you group together to create a vector of information that CS-Engage treats as a single record. This vector of data is the **history definition**. For example, a history definition called “purchases” can consist of the history attributes “SKU,” “itemname,” “quantity,” and “price.”

CS-Engage references data stored as a history definition as a whole or an aggregate. It assigns a timestamp to each instance of the recorded definition and keeps each of those records. This means that you can sum or count history definitions and you can determine the first time or the last time a history definition was recorded for a visitor. Using the example in the preceding paragraph, you can create a segment based on the amount of money a visitor spends on specific items during a set period of time.

History definitions store historical data.

## Segments

Segments are assets that divide visitors into groups based on common characteristics. Segments are built by determining which visitor data assets to base them on and then setting qualifying values for those criteria.

When you create visitor data assets, you create fields. These fields can be used in two places:

- As criteria for segments. That is, as configuration options in the CS-Engage Segment Filtering forms (because you define segments with the visitor data assets). In other words, the choices you make about the data types for the attributes determine their appearance and behavior in the Segment forms. When you create these assets, you are customizing the Segment forms.
- On your public site pages. That is, as form fields or hidden fields on registration pages and other pages.

Segments are the key to personalizing merchandising messages with CS-Engage. When visitors browse your site, the information they submit is used to qualify them for segment membership. When the site displays a page with a recommendation or promotion, CS-Engage determines which segments a visitor belongs to and displays the product recommendations or promotional messages that are designated for those segments.

For help with creating segments, see the *CSEE User's Guide*.

## Categories

CS-Engage uses categories to group visitor attributes and history definitions into useful links on the Segment forms. The visitor data assets are listed under categories that are displayed across the top of the forms. For example:

### Segment Filtering Criteria:

Buyer Contact ▶ Demographics ▶ Buyer history ▶ Shopping Cart

Because visitor attributes and history definitions are such different types of assets, you must use separate categories for them. You create categories when you enter text in the Category field on a visitor attribute or history definition form. If the name you enter is not in use yet, CS-Engage creates a new category.

## Transact Visitor Data Assets

If your online site uses Transact version 5 or higher (Transact is the FatWire™ electronic commerce application), there are 17 visitor attributes, 4 history attributes, and 1 history definition loaded into the CSEE database during the installation of CS-Engage. In other words, if your site uses Transact, there are predefined, default visitor assets that the marketers can use in segments without your having to create them first.

In the Segment Filtering forms, the Transact visitor attributes are listed under a category named **Buyer Contact**. You can use this category when you create new visitor attributes.

The default Transact history definition, called **Purchase summary**, is listed under the category named **Buyer history**. You can use this category when you create new history definitions.

For the names of all the default Transact attributes, see “About the Transact Visitor Data” on page 708.

## Developing Visitor Data Assets: Process Overview

There are five general steps for creating and using visitor data assets (fields):

1. A cross-functional design team including developers and marketers determines what kind of data you want to gather about your site visitors.
2. You (the developers) create and define the necessary visitor attributes, history attributes, and history definitions by using the forms in CS-Engage.
3. The marketers use the Segment Filtering forms in CS-Engage to categorize groups of visitors based on these visitor attributes, history attributes, and history definitions.
4. You program the appropriate site pages with the CS-Engage XML or JSP object methods to collect and store the data, using either server-side validation or Javascript to validate the input on the pages. For example, you can create an online registration form for visitors to fill out by using JavaScript to validate the input and the CS-Engage XML or JSP tags to process and store that information in the CSEE database.
5. When visitors browse your site, the information they submit is used to qualify them for segment membership. If your site is using promotions and recommendations based on segments, the message displayed for the visitor is personalized based on the segments that he or she qualifies for.

## Creating Visitor Data Assets

Before you begin creating visitor data assets, be sure that you have completed the following tasks:

- Met with the marketing and design teams to determine the kinds of data that you want to collect about visitors.
- Examined the Segment Filtering forms so that you understand the context in which the visitor data assets that you create are used by the marketers. Additionally, note that the **visitor data assets** are listed by their **descriptions** rather than by their names in the Segment Filtering forms.

You can use the following data definitions for your visitor and history attributes:

- string – can hold up to 255 characters
- boolean – true and false are the only legal values
- short – valid range of values is 0 through 255
- integer – valid range of values is 0 through 65,535
- long – valid range of values is 0 through 65,535
- double – valid range of values is 0 through 4,294,967,295
- date – format is yyyy-mm-dd hh:mm:ss.s
- money – format is currency; valid range of values is unlimited
- binary – for visitor attributes only; used for binary data such as image files or cart objects

### Note

Binary visitor attributes can record binary data for individual visitors. Visitor attributes of this type are not displayed in the Segment Filtering forms and cannot be used to define a segment. Creating an attribute of type binary reserves space in the CSEE database that you use to store objects by using the XML object method `VDM.SAVESCALAROBJECT` or its JSP equivalent `vdm:savescalarobject` to convert an object from the Content Server name space into a binary form.

## Creating Visitor Attributes

Use the procedures in this section to create visitor attributes with the CS-Engage forms.

### Step 1: Name and Define the Visitor Attribute

1. If necessary, log in to the Content Server interface, and if given a choice, select a site.
2. Click **New** on the button bar.
3. Select **ScalarVals** from the list of asset types. (Visitor Attribute asset types must be enabled for your site.)



The **Visitor Attribute** form appears.

### Note

If **Visitor Attribute** does not appear in the menu list, it means that your login/password combination does not give you administrator rights. Contact the site administrator and request that the admin user profile be assigned to your user name.

4. In the **Name** field, enter a unique, descriptive name for the attribute (field). You can enter up to 32 alphanumeric characters, including spaces. The first character must be a letter.
5. In the **Description** field, enter a brief description of the attribute (field). You can enter up to 128 alphanumeric characters but you should keep this description as short as you can because **attributes** are listed by their **descriptions** rather than their names in the **Segment Filtering** forms.
6. In the **Category** field enter the category for the attribute. The text that you enter in this field determines where the attribute is listed in the Segment Filtering forms. You can enter up to 32 alphanumeric characters.

### Note

Categories for visitor attributes must be different from the categories for history definitions.

## Step 2: Configure the Data Type

1. In the **Type** field select a data type.
  1. If you selected **string**, in the **Length** field enter the maximum number of characters allowed for input in the attribute (field). You can enter a value up to 255.
  2. In the **Null allowed** field, select **true** to allow null values or **false** to require input for the attribute when it is used. For example, an attribute with a Boolean data type cannot allow a null value.
  3. If you selected **false** in the **Null allowed** field, in the **Default Value** field enter a default value that is appropriate for the attribute's data type. For example, if the data type is "integer" the default value must be a number.

**Note**

If you selected **binary** as the data type, you cannot specify a default value for the attribute.

**Step 3: Configure the Constraint Criteria**

The constraint options that are available for validating input into the attribute depend on the data type that you designated for the attribute.

**Option 1: Configure the attribute to accept free-form text**

In the **Constraint type** field select none from the drop-down list. For example, a visitor attribute named “residence” and of type string might accept unconstrained text as input.

**Option 2: Configure the attribute to accept input from a range of values**

To configure the attribute to accept a specific range of values, the data type must be integer, short, long, double, or money.

1. In the **Constraint type** field and select range.

The form displays range fields.

2. In the **Lower range limit** field and specify the smallest possible value that can be accepted in the attribute when it is used as a field. This value cannot be a negative number.
3. In the **Upper range limit** field, enter the largest possible value that can be accepted in the attribute when it is used as a field. (For a short data type, you can enter a value up to 255; for integer, up to 65,535; for double, up to 4,294,967,295; for money, unlimited.)

For example, an attribute named “age” can be restricted to accept only values between 1 and 110.

Type:	<input type="text" value="integer"/>
Null allowed?	<input type="text" value="true"/>
Constraint type:	<input type="text" value="range"/>
<b>Range Constraints</b>	
Lower range limit:	<input type="text" value="1"/>
Upper range limit:	<input type="text" value="110"/>

**Option 3: Configure the attribute to offer a set list of values in a drop-down list**

1. In the **Constraint type field** and select enumeration.

The form displays text boxes for adding options.

2. In the **Add Enumerated Value** field, enter the name of the first option. For example, an attribute named “gender” can have “female” as an option.
3. Click **Add**.

The option is moved to the list.

Constraint type: enumeration

---

**Enumeration Constraints**

Add enumerated value:  Add

Legal values: 

male  
female

Remove

4. Repeat these steps for each of the options that you want to make available for this attribute (field).

## Step 4: Save the Attribute

1. (Optional) If more than one site is set up and you have access to those sites, specify whether you want to share this attribute with the other sites. In the **Other Publications** list, select the name of a site and click the arrow button to move it to the Selected list.
2. When you are finished configuring the visitor attribute, click **Save**.

CS-Engage creates an entry for this attribute in the visitor data asset tables in the CSEE database and reserves a place in the database to store information of that type for your site visitors.

CS-Engage then displays a summary of the attribute in the **Inspect** form.

You can now use this visitor attribute in a segment.

### Note

After a visitor attribute is used to define a segment, deleting the attribute invalidates the segment. Be sure to correct your segments if you delete an attribute.

## Creating History Attributes

The purpose of history attributes is different from the purpose of visitor attributes: you create history attributes to be used by history definitions. You cannot use them in the Segment Filtering forms until they are used to define a history definition.

Use the procedures in this section to create history attributes by using the CS-Engage forms.

### Note

You cannot edit or delete a history attribute after it has been used to define a history definition. You also cannot remove it from the history definition. If you must change a history attribute after it has been used to define a history definition, it is best to stop using the history definition. Create a new history attribute, create a new history definition, and then start using the new history definition.

## Step 1: Name and Define the History Attribute

1. If necessary, log in to the Content Server interface, and if given a choice, select a site.
2. Click **New** on the button bar and select **History Attribute** from the list.

The **History Attribute** form appears.

History Attribute:

\*Name:

\*Description:

Type:

Must be specified?

Filter by?

Constraint type:

Null allowed?

### Note

If History Attribute does not appear in the menu list, it means that your login/password combination does not give you administrator rights. Contact the site administrator and request that the admin user profile be assigned to your user name.

3. In the **Name** field, enter a unique, descriptive name for the attribute (field). You can enter up to 32 alphanumeric characters, including spaces. The first character must be a letter.
4. In the **Description** field, enter a brief description of the attribute (field). You can enter up to 128 alphanumeric characters but you should keep this description as short as you can because **attributes** are listed by their **descriptions** rather than their names in the **Segment Filtering** forms.

## Step 2: Specify that the Attribute Can Be a Filter Criterion

1. If you want this attribute to be a required field when the history definitions that use it are used to define a segment, click in the **Must be specified** field and select **true**.
2. Click in the **Filter by** field and select **true**.

If you do not set **Filter by** to true, the marketers cannot use the attribute (field) as a constraint for any history definition that it belongs to when they create segments.

If the data type for this attribute is numeric, then by default the attribute is included in the list of attributes that can be selected for a Total constraint in a segment—whether you set **Filter by** to true or to false. However, if you want to use a numeric attribute as a constraint in any other way, you must set **Filter by** to true.

### Step 3: Configure the Data Type

1. Click in the **Type** field and select a data type.
2. If you selected **string**, in the **Length** field enter the maximum number of characters allowed for input in the attribute (field).
3. Click in the **Null allowed** field and select `true` to allow null values or `false` to require input for the attribute when it is used. For example, an attribute with a Boolean data type cannot allow a null value.
4. If you selected `false` in the **Null allowed** field, in the **Default Value** field enter a default value that is appropriate for the attribute's data type. For example, if the data type is "integer" the default value must be a number.

### Step 4: Configure the Constraint Criteria

The constraint options available for validating input into the attribute depend on the data type you designated for the attribute.

#### Option 1: Configure the attribute to accept free-form text

Click in the **Constraint type** field and select `none` from the drop-down list. For example, a history attribute named "Street Name" and of type string might accept unconstrained text as input.

#### Option 2: Configure the attribute to accept input from a range of values

To configure the attribute to accept a specific range of values, the data type must be integer, short, long, double, or money.

1. In the **Constraint type** field, select `range`.  
The form displays range fields.
2. In the **Lower range limit** field, specify the smallest possible value that can be accepted in the attribute when it is used as a field. This value cannot be a negative number.
3. In the **Upper range limit** field, enter the largest possible value that can be accepted in the attribute when it is used as a field. (For a short data type, you can enter a value up to 255; for integer, up to 65,535; for double, up to 4,294,967,295; for money, unlimited.)

For example, an attribute named "Number of Items" can be restricted to accept only values between 1 and 50.

Constraint type:	<input type="text" value="range"/>
Null allowed?	<input type="text" value="true"/>
<b>Range Constraints</b>	
Lower range limit:	<input type="text" value="1"/>
Upper range limit:	<input type="text" value="50"/>

**Option 3: Configure the attribute to offer a drop-down list of specific values**

1. In the **Constraint type field**, select enumeration.

The form displays text boxes for adding options.

2. In the **Add Enumerated Value** field, enter the name of the first option. For example, an attribute named “Browser” can have “Netscape” as an option.
3. Click **Add**.

Enumeration Constraints

Add enumerated value:

Legal values: 

Netscape  
InternetExplorer

4. Repeat these steps for each of the options that you want to make available for this attribute (field).

**Step 5: Save the History Attribute**

When you are finished configuring the history attribute, click **Save**.

CS-Engage creates an entry for this attribute in the visitor data asset tables in the CSEE database and reserves a place in the database to store information of that type for your site visitors.

You can now use this history attribute to define a history definition.

**Creating History Definitions**

History definitions are made up of history attributes. Therefore, there must be at least one history attribute created before you can create a history definition.

Use this procedure to create history definitions by using the CS-Engage forms:

1. If CS-Engage is not open, log in.
2. Click **New** and select **History definition** from the list.

The **History definition** form appears:

History Type: \_\_\_\_\_

\*Name:

\*Description:

\*Category:

History Attributes:

Available	Selected
Browser type	
Number of visits	
Wish list item 1	
Wish list item 2	

--> <--

Current Publication: The Movie Vault

**Note**

If History definition does not appear in the menu list, it means that your login/password combination does not give you administrator rights. Contact the site administrator and request that the admin user profile be assigned to your user name.

3. In the **Name** field, enter a unique, descriptive name for the history definition (record). You can enter up to 32 alphanumeric characters, including spaces. The first character must be a letter.
4. In the **Description** field, enter a brief description of the history definition (record). You can enter up to 128 alphanumeric characters but you should keep this description as short as you can because **history definitions** are listed by their **descriptions** rather than their names in the **Segment Filtering** forms.
5. In the **Category** field, enter a category for the history definition. The text that you enter in this field determines how the history definition is sorted and displayed in the Segment Filtering forms. You can enter up to 32 alphanumeric characters.

**Note**

Categories for history definitions must be different from the categories for visitor attributes.

6. In the **Fields** area, select the history attributes that make up this history definition. Select an attribute and then click the right arrow to move it to the list on the right. Use control + click to select more than one attribute at the same time.

**Note**

After a history attribute is used to define a history definition, you can no longer edit or delete that history attribute.

7. Click **Save**.

CS-Engage creates an entry for this history definition (record) in the visitor data asset tables in the CSEE database and reserves a place in the database to store information of that type for your site visitors.

CS-Engage then displays a summary of the history definition in the **Inspect** form.

You can now use this history definition in a segment.

## Verifying Your Visitor Data Assets

To determine that you correctly set up your visitor attributes, history attributes, and history definitions, examine the Segment Filtering forms and decide whether the visitor assets that you created were configured correctly:

- Create segments that use each of the visitor attributes and history definitions that you created.
- Determine that the constraint definitions are correct and that the input ranges are accepting the correct range of input.

For help with creating segments, see the *CSEE User's Guide*.

## Approving Visitor Data Assets

When your visitor data assets are ready, approve them so that they can be published to the delivery system.

When a history definition is published, the history attributes that are used to define it are also published. That means that you have to approve all the history attributes in a history definition before the history definition can be published.

To approve any asset, select **Approve for Publish** from the drop-down list in the icon bar in the asset's **Edit** or **Inspect** form.

The procedure for approving any asset, including visitor attributes, history attributes, and history definitions, is presented in the *CSEE User's Guide*.



## Chapter 36

# Recommendation Assets

**Recommendations** are assets that determine which products or content should be featured or “recommended” on a rendered page. These assets are a set of rules that are based on the segments the visitors qualify for, and, in some cases, relationships between the product and/or content assets.

This chapter describes how recommendations work and how to create a custom element that returns assets to be recommended. It includes the following sections:

- Overview
- Creating a Dynamic List Element

## Overview

A recommendation asset collects, assesses, and sorts CS-Direct Advantage product and content assets and then recommends the most appropriate content or product assets for the current visitor. How does it determine which are the most appropriate assets? By consulting the list of segments that the visitor belongs to.

The CS-Direct Advantage product and content flex assets are rated for their importance to each segment. When a recommendation asset is called from a template, CS-Engage determines which segments the current visitor qualifies for, and then selects the assets that are identified by the recommendation as having the highest rating for those segments. These are the assets that are “recommended” to the visitor.

There are three kinds of recommendations:

- **Static Lists** – return a static list of recommended items
- **Dynamic Lists** – return a list of recommended items that is generated by a dynamic list element that you create
- **Related Items** – return a list of recommended items based on relationships between content and/or product assets

CS-Engage uses a recommendation's configuration options and the asset ratings to constrain the list when the list contains more items than the template is programmed to display. For related items recommendations, CS-Engage also uses asset relationships to constrain the list. For all recommendations, CS-Engage eliminates assets that are rated 0 for the current visitor.

The recommendation asset is the only CS-Engage asset that can be assigned a template. You code your recommendation templates to render the items that the recommendation returns in an appropriate way on the rendered page.

The template tells the recommendation how many assets to return, and the recommendation asset determines which assets to select and return to the template based on the way it is configured and on the segments that the current visitor belongs to.

There are several XML and JSP object methods (tags) that you can use to code templates for recommendations. For information about coding templates when you are using CS-Engage, see Chapter 37, "Coding CS-Engage Pages." For information about all of the CS-Engage tags see the *CSEE Developer's Tag Reference*.

## Development Process

Following are the basic steps for setting up recommendations:

1. Developers and designers meet with the marketing team to define all the merchandising messages that you want to display on your site and to plan how to represent those messages using recommendation and promotion assets.
2. The developers and designers use the XML or JSP object methods to design and code templates for the recommendations. Chapter 37, "Coding CS-Engage Pages," explains how to code these templates.
3. If the web site will use dynamic list recommendations, the developers code the dynamic list elements that return the assets to recommend. The "Creating a Dynamic List Element" section of this chapter explains how to code dynamic list elements.
4. The marketing team uses the CS-Engage recommendation wizard to create and then configure the recommendations. They assign the appropriate template to the appropriate recommendation.
5. Using the CS-Engage product and content asset forms, the marketers rate how important the assets are to each segment, and, therefore, to the individual visitors who become members of those segments. (Typically, you assign ratings to flex parents, such as product parents, instead of to individual assets.)
6. For each context-based recommendation, the marketers configure the relationships that are defined by those recommendations by assigning assets to each other. (Typically, you configure relationships among flex parents, such as product parents, instead of individual assets.)

## Creating a Dynamic List Element

If your web site uses dynamic list recommendations, you must code the dynamic list elements that return lists of recommended assets. A dynamic list element is an instance of the CSElement asset type; this ensures that the dynamic list element will be transferred to the delivery system when the web site that uses it is published.

A dynamic list element must return a list named `AssetList`. The assetset that becomes your `AssetList` must have the following traits:

- It must contain only assets of the types that you want to recommend.
- It must contain the IDs of the assets that you want to recommend.
- It should contain the assets' confidence ratings, although this is optional.

The following sample code is an excerpt from a dynamic list element:

```
1  <SEARCHSTATE.CREATE NAME="ssprod"/>
2  <SEARCHSTATE.ADDSIMPLESTANDARDCONSTRAINT NAME="ssprod"
    TYPENAME="PAttributes" ATTRIBUTE="BrowseCategory"
    VALUE="Fund Type"/>
```

Line 2 adds a constraint to the `ssprod` searchstate, filtering it to find items with a browse category of `Fund Type`.

```
3  <ASSETSET.SETSEARCHEDASSETS NAME="asprod"
    CONSTRAINT="ssprod" ASSETTYPES="Products"/>
```

Line 3 adds another constraint to the `ssprod` searchstate, creating an assetset composed entirely of `Product` assets.

```
4  <ASSETSET.GETASSETLIST NAME="asprod"
    LISTVARNAME="AssetList"/>
```

Finally, line 4 turns the assetset created in line 3 into the `AssetList` list.

When you have completed coding your dynamic list elements, provide their names and information about what sort of content they return to the users who will create the recommendation assets.

For information about creating recommendation assets, see the *CSEE User's Guide*.



## Chapter 37

# Coding CS-Engage Pages

This chapter presents information about designing an online site that gathers visitor information and personalizes promotional messages for each visitor based on that information.

This chapter contains the following sections:

- Commerce Context and Visitor Context
- Identifying Visitors and Linking Sessions
- Collecting Visitor Data
- Templates and Recommendations
- Shopping Carts and CS-Engage
- Debugging Site Pages

### Note

This chapter refers to specific XML tags that you use to accomplish the tasks being described. In all cases, there are also equivalent JSP tags. The XML and JSP tags are all documented in the *CSEE Developer's Tag Reference*.

## Commerce Context and Visitor Context

During a visitor's session at a CS-Engage site, a visitor context is created for that visitor. Five types of session objects are placed in the visitor context:

- Current shopping cart
- List of segments that the visitor belongs to
- List of promotions that the visitor qualifies for
- Time object that is used for calculating time-based rules for segments and promotions
- Utility object that gives you, the developer, access to product attributes

The commerce context encompasses the visitor context and gives you access to it.

There are two sets of XML and JSP object methods that serve as your interface to these contexts:

- Commerce Context methods, which you use to place objects in the visitor context.
- Visitor Data Manager methods, which you use to gather, store, and retrieve visitor data and to associate a visitor's data with the correct visitor.

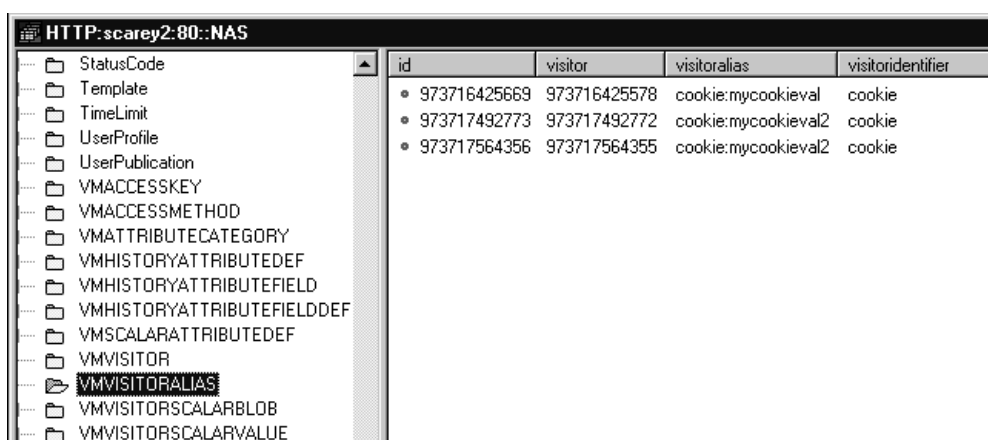
## Identifying Visitors and Linking Sessions

CS-Engage creates a unique visitor ID for each visitor for each session. It stores these IDs in the `VMVISITOR` table in the Content Server database. The data gathered for a visitor during that session is identified by that visitor ID. To link the data gathered from one session to the data from another, your site pages must assign aliases that link those visitor IDs.

You use the following Visitor Data Manager object method to create an alias:

```
<VDM.SETALIAS KEY="keyvalue" VALUE="aliasvalue"/>
```

When you use this tag, CS-Engage associates the visitor session ID with the alias, and writes them both to the `VMVISITORALIAS` table.



id	visitor	visitoralias	visitoridentifier
973716425669	973716425578	cookie:mycookieval	cookie
973717492773	973717492772	cookie:mycookieval2	cookie
973717564356	973717564355	cookie:mycookieval2	cookie

The values in this table link the data that is gathered in separate sessions to the same visitor because the alias provides a link to the visitor IDs that are recorded for that visitor. In the illustration above, the data recorded in the session associated with the visitor ID

973717492772 is linked to the data associated with the visitor ID 973717564355 because they have aliases with the same key/value pair.

All visitor information that is associated with sessions that are linked through common aliases — that is, aliases with the same key/value pairs — can be accessed during the current session. It is considered current visitor information.

You can create aliases with cookies, with login IDs, or with any other unique identifier that your site uses to recognize visitors.

The `VMVISITORALIAS` table grows quickly. For information about managing it and the other visitor data tables, see the *CSEE Administrator's Guide*.

## About Commerce and Access IDs

If your site uses segments based on Transact visitor data, Commerce Connector needs the visitor's Transact ID to obtain that data. After a visitor is authorized by Transact, use the following Visitor Data Manager object method to store the ID in session data:

```
<VDM.SETCOMMERCEID ID="userid"/>
```

After the ID is set during a session, you can use it to retrieve visitor data from Transact.

If your site has an external system other than Transact, you can use the following Visitor Data Manager object method after that system authorizes the visitor:

```
<VDM.SETACCESSID KEY="pluginname" ID="userid"/>
```

This method stores the visitor's access ID for a database or system other than Transact into session data so that you can use it to retrieve visitor data from that system.

Because these IDs identify your visitor, you should also create aliases that are based on these IDs.

### Note

For more information about these and other object methods, and their JSP equivalents, see the *CSEE Developer's Tag Reference*.

## Example: Session Linking with Cookies and Transact IDs

A visitor named Terry browses the online catalog at [www.buythings.com](http://www.buythings.com) during four separate visitor sessions on two different computers. The aliases created by the [www.buythings.com](http://www.buythings.com) pages during these sessions link all four visitor sessions and identify the information gathered about Terry during those sessions with Terry.

### Session 1

In session 1, Terry checks the prices for several items but does not buy anything. The following events occur:

- The [www.buythings.com](http://www.buythings.com) home page checks the cookie directory on Terry's computer for a [www.buythings.com](http://www.buythings.com) cookie, doesn't find one, and then sets one.
- The home page uses a `VDM.SETALIAS` tag to set an alias with the value of the cookie it just set as the value of the alias.

- CS-Engage creates a unique visitor ID for this session, associates it with the cookie-based alias, and writes the name/value pair of the alias and the visitor ID to the `VMVISITORALIAS` table in the Content Server database.

## Session 2

In session 2, Terry checks the price on an item and then buys it. He uses the same computer that he used in session 1. The following events occur:

- The `www.buythings.com` home page checks the cookie directory on Terry's computer for a `buythings.com` cookie, finds it, and then uses the `VDM.SETALIAS` tag to set an alias with the value of the cookie as the value for the alias.

This alias has the same key/value pair as the cookie-based alias set in session 1.

- CS-Engage creates a unique visitor ID for this session, associates it with the cookie-based alias, and writes the name/value pair of the alias and the visitor ID to the `VMVISITORALIAS` table in the Content Server database.
- When Terry clicks the **Buy** button, the Transact processing sequence handles the order and then sends back a Transact user identifier with the confirmation.
- The confirmation page uses a `VDM.SETALIAS` tag to set another alias with the user ID returned by the Transact authentication as the value of the alias.
- CS-Engage writes the name/value pair of the Transact-based alias and the visitor ID created for this session to the `VMVISITORALIAS` table in the Content Server database.

## Session 3

In session 3, Terry buys another item. This time he uses the computer in his office, which is not the computer he used in sessions 1 and 2. The following events occur:

- The `www.buythings.com` home page checks the cookie directory on Terry's office computer for a `buythings.com` cookie, doesn't find one, and sets one.
- The home page uses a `VDM.SETALIAS` tag to set an alias with the value of the cookie it just set as the value of the alias.
- CS-Engage creates a unique visitor ID for this session, associates it with the cookie-based alias, and writes the name/value pair of the alias and the visitor ID to the `VMVISITORALIASalias` table in the Content Server database.

- When Terry clicks the **Buy** button, the Transact processing sequence handles the order and sends back a Transact user identifier with the confirmation.

This is the same Transact ID as the one in session 2 because a visitor's Transact ID is always the same.

- The confirmation page uses a `VDM.SETALIASALIAS` tag to set another alias with the user ID returned by the Transact authentication as the value of the alias.

This alias has the same key/value pair as the Transact ID-based alias set in session 2.

- CS-Engage writes the name/value pair of the Transact ID-based alias and the visitor ID created for this session to the `VMVISITORALIAS` table in the Content Server database.

## Session 4

In session 4, Terry uses the computer in his office (the same one he used in session 3) to quickly check the price for one item but he doesn't buy it. The following events occur:



- The `www.buythings.com` home page checks the cookie directory on the pc in Terry's office, finds it, and then uses the `VDM.SETALIAS` tag to set an alias using "cookie" as the key and the value of the cookie as the value for the alias.

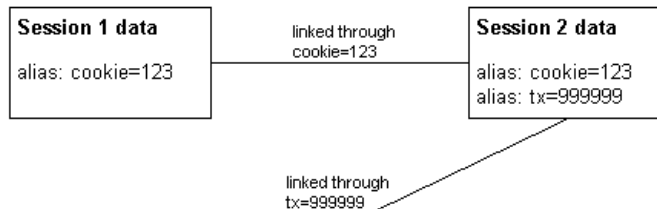
This alias has the same key/value pair as the cookie-based alias set in session 3.

- CS-Engage creates a unique visitor ID for this session, associates it with the alias, and writes the name/value pair of the cookie-based alias and the visitor ID to the `VMVISITORALIAS` table in the Content Server database.

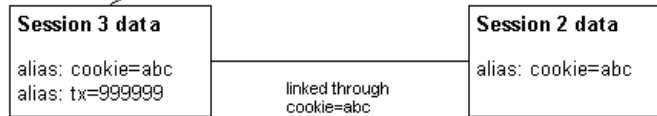
## Result

- Sessions 1 and 2 have cookie-based aliases with the same key/value pair.
- Sessions 2 and 3 have Transact ID-based aliases with the same key/value pair.
- Sessions 3 and 4 have cookie-based aliases with the same key/value pair.

### Terry at home:



### Terry at work:



Any information gathered from Terry in sessions 1, 2, and 3 is associated with Terry and is available to CS-Engage in session 4. It is available because session 4 is linked to session 3, which is linked to session 2, which is linked to session 1.

Although this example uses a Transact ID to link sessions 2 and 3, you can create aliases that link sessions across machines by using any kind of unique visitor ID.

## Coding Site Pages That Identify Visitors

To identify your visitors and link their sessions, you must complete at least the following general steps when coding your site pages:

1. Create an element that gets called by all root elements in the site. Code the element to do the following:
  - a. Check for a cookie.
  - b. Create the cookie if it doesn't find one.
  - c. Update the time-out setting for the cookie if it does find one.
  - d. Set an alias using "cookie" as the key and the cookie's value as the value. For example, `<VDM.SETALIAS KEY="cookie" VALUE="CS.UniqueID"/>`

For another example, use Content Server Explorer to examine `ElementCatalog/OpenMarket/Demos/CatalogCentre/GE/Navigation/styleSheet.xml`.

2. Code any pages that handle Transact processing requests to do the following:
  - a. Set an alias using “tx” as the key and the user’s Transact ID (commerce ID) as the value.
  - b. Set the commerce ID in session data so that the site can use it to retrieve Transact visitor data during the session.

For an example, use Content Server Explorer to examine `ElementCatalog/OpenMarket/Demos/CatalogCentre/GE/myge.xml`.

3. Code any pages that process other visitor identifications (a login ID, for example) to set an alias using that identifier.

# Collecting Visitor Data

To collect visitor data, you must program your online pages to gather it, validate it, and then write it to the Content Server database.

There are three Visitor Data Manager object methods that write this information to the database:

- `<VDM.SETSCALAR ATTRIBUTE="attribute" VALUE="value"/>` records visitor attributes.
- `<VDM.RECORDHISTORY ATTRIBUTE="attribute" LIST="valuelist"/>` records history definitions.
- `<VDM.SAVESCALAROBJECT ATTRIBUTE="attribute" OBJECT="objectname"/>` records visitor attributes of type binary. The demo site delivered with CS-Engage uses this method to store shopping carts across sessions and to store saved searches for visitors.

**Note**

Because these tags write information to the database, they can be a factor in the performance of your delivery system. Be sure to use them efficiently,

These are the tables that store the visitor data:

XML or JSP Object Method	Database Table That It Writes To
VDM.SETSCALAR vdm:setscalar	VMVISITORSCALARVALUE
VDM.SAVESCALAROBJECT vdm:savescalarobject	VMVISITORSCALARBLOB
VDM.RECORDHISTORY vdm:recordhistory	VMz----- (These tables are dynamically generated for each history definition. CS-Engage creates a unique table for each one.)

These tables grow quickly. For information about managing them, see the *CSEE Administrator's Guide*.

There are also a number of Visitor Data Manager object methods that retrieve this information from the Content Server (or Transact) database. See Chapter 7, "Error Logging and Debugging."

**Note**

For information about these and other CS-Engage XML and JSP tags, see the *CSEE Developer's Tag Reference*.

## About the Transact Visitor Data

If your online site uses Transact, there are 17 visitor attributes, 4 history attributes, and 1 history definition loaded into the Content Server database during the installation of CS-Engage.

You do not have to use the Visitor Data Manager object methods to write Transact data to the Content Server database for CS-Engage to use that information for calculating segments. When CS-Engage calculates a segment that is based on Transact data, it automatically calls Commerce Connector to obtain the data that it needs to qualify or disqualify the visitor for the segment.

If you want to **retrieve** values from the Transact attributes for reasons of your own (not having to do with segment calculation), be sure to refer to them by their **names** rather than by their descriptions, which is how they are listed in the Segment forms.

Note that although you can use the Visitor Data Manager object methods to retrieve values from the Transact database, it is not an efficient method of retrieving that data.

The following table presents the default Transact visitor attributes.

Name	Description
tx.accessName	Login name
tx.address1	Street address
tx.address2	Additional street address information
tx.city	City name
tx.country	Two character country code
tx.county	County name
tx.emailAddress	Email address
tx.fax	FAX number
tx.locale	Locale setting (See the note that follows this table.)
tx.name1	Name of person (By default, this is first and last name. Your Transact database might be configured differently.)
tx.name2	Additional name information about a person such as title
tx.password	Password
tx.postalCode	Postal or zip code
tx.state	State or province name
tx.telephone	Telephone number
tx.url	WWW address (URL)

**Note**

For **Locale setting**, marketers can enter either a two-letter language code plus a two-letter country code (en-uk, for example), or only the language code. For an up-to-date list of the valid codes that they can use, see the following URLs:

[www.ics.uci.edu/pub/ietf/http/related/iso639.txt](http://www.ics.uci.edu/pub/ietf/http/related/iso639.txt)  
[www.ics.uci.edu/pub/ietf/http/related/iso3166.txt](http://www.ics.uci.edu/pub/ietf/http/related/iso3166.txt)

The following table presents the default Transact history attributes and the default Transact history definition. The Segment forms display them by their descriptions rather than their names. If you want to **write** values for or **retrieve** values from these attributes, be sure to refer to them by their **names** rather than by their descriptions:

Name	Kind of asset	Description
tx.purchasesummary	history definition	Purchase summary
tx.productList	history attribute	Product list (The list of products stored in the product tables in your Content Server database.)
tx.store	history attribute	Store ID (The list of the store IDs present in the Transact database.)
tx.totalItemsPurchased	history attribute	Total number of items
tx.totalSalesAmount	history attribute	Total amount of sales

## Coding Site Pages That Collect Visitor Data

This section presents an overview of the general steps that you follow when you code your site pages to collect visitor data:

1. Create forms to capture the data that you need your visitors to manually provide. It is a good practice to create form fields with names that match the names of the attributes that you created. (See Chapter 35, “Creating Visitor Data Assets,” for more information.)

Attributes are listed by their descriptions rather than by their names in the CS-Engage Segment forms. Be sure that you do not confuse their attribute names with attribute descriptions when you are creating form fields or writing values to the Content Server database.

2. Create a “submit” page that validates the data that the visitor entered in the fields (either by using JavaScript or with a server-side validation method). The input data must comply with the constraints that you set for the attributes. For example, if you created a visitor attribute of type string with a length of 30, be sure that the form does not try to submit data from the form field with a length of 31.
3. Program the “submit” page to write the validated data to the Content Server database. Be sure to use the names of the attributes and history definitions and not their descriptions. Here are some examples:

**Example 1: Visitor Attributes**

```
<!-- Write the registration information to the database.-->
<VDM.SETSCALAR ATTRIBUTE="name" VALUE="Variables.name"/>
<VDM.SETSCALAR ATTRIBUTE="age" VALUE="Variables.age"/>
<VDM.SETSCALAR ATTRIBUTE="jobdesc" VALUE="Variables.jobdesc"/>
```

**Example 2: History Definition**

Because history definitions hold multiple values as an aggregate, you must create a list of the data before you can write it to the database. In this example, a form writes an order to the Content Server database:

```
<!-- Write the order details to a list. -->
<!-- assume that Variables.order_id is set to the order id -->
<!-- assume that Variables.wasCouponUsed is set to 1 (yes) or 0
(no) -->
<!-- assume that Variables.shippingtype is set to UPS or FedEx
-->
<!-- assume that Variables.order_price is set to the total
amount of the
order -->

<LISTOBJECT.CREATE NAME="histList" COLUMNS="orderid,
shippingtype, price, couponUsed"/>
<LISTOBJECT.ADDROW NAME="histList" orderid="Variables.order_id"
shippingtype="Variables.shippingtype"
price="Variables.order_price"
couponUsed="Variables.wasCouponUsed"/>
<LISTOBJECT.TOLIST NAME="histList" LISTVARNAME="itemList"/>

<!-- Write the list to the history definition named
visitorOrderHistory in the Content Server database.-->
<VDM.RECORDHISTORY ATTRIBUTE="visitorOrderHistory"
LIST="itemList"/>
```

And you can use that record to determine information about how many orders a visitor had made, when their first or last purchase was, and the total amount they've spent.

**Example 3: Visitor Attribute of Type Binary**

Binary visitor attributes allow you to convert an object from the Content Server name space into a binary form. The sample site delivered with CS-Engage uses two visitor attributes of type binary: one to store shopping carts across sessions and one to store saved searches.

To see these examples, use Content Server Explorer to examine `ElementCatalog/OpenMarket/Demos/CatalogCentre/GE/Navigation/styleSheet.xml` and `ElementCatalog/OpenMarket/Demos/CatalogCentre/GE/myge.xml`

4. If you want to gather data about visitor behavior (clickstream information, for example), you can program your pages to gather that without using input forms. For example, the demo site delivered with CS-Engage uses a history definition to record the number of times a visitor browses the site.

For this examples, use Content Server Explorer to examine `ElementCatalog/OpenMarket/Demos/CatalogCentre/GE/Navigation/styleSheet.xml`

5. Whenever visitor data is written to the database, segments and promotions can also change. Therefore, after any change to visitor data, be sure to recalculate the segments and promotions lists. There are two Commerce Context object methods that you can use:

```
COMMERCECONTEXT.CALCULATEPROMOTIONS
```

```
COMMERCECONTEXT.CALCULATESEGMENTS
```

`COMMERCECONTEXT.CALCULATEPROMOTIONS` recalculates both the segments that the visitor belongs to and the promotions that apply to those segments.

6. Whenever visitor data is written to the database, ratings for assets can also change. Therefore, after any change to visitor data, be sure to refresh the ratings of any assets that are in an existing asset set.

Use the `ASSETSET. ESTABLISHRATINGS` tag to refresh the asset ratings of the assets in a set.

### Note

For information about these and other CS-Engage XML and JSP object methods, see the *CSEE Developer's Tag Reference*.

## Templates and Recommendations

The key Commerce Context object method for invoking a recommendation asset is this one:

```
<COMMERCECONTEXT.GETRECOMMENDATIONS  
COLLECTION="recommendationname" [LIST="inputlist" VALUE="rating"  
MAXCOUNT="assetcount" ] LISTVARNAME="assetlist"/>
```

This method retrieves and lists the assets that match the recommendation constraints passed to the method. It uses the following arguments:

- **COLLECTION** – the name of the recommendation. If you plan to use the same template for several recommendations, code the template to supply the identity of the recommendation through a variable.
- **LIST** – the name of the list of assets; this is the name that you want to be used as the input for the calculation.

You use this argument when the recommendation named by **COLLECTION** is a context-based recommendation. Columns are `assettype` and `assetid`. You can create this list by creating a list object and adding rows for each asset that you want to use as input. For an example, use Content Server Explorer to examine `ElementCatalog/OpenMarket/Demos/CatalogCentre/GE/cart.xml`.

- **VALUE** – the default rating for assets that do not have one. If you do not declare a value, unrated assets are assigned a default rating of 50 on a scale of 0-100. FatWire recommends that you keep this value set to 50. For more information about the system default rating, see the recommendation asset section in the *CSEE User's Guide*.
- **MAXCOUNT** – (optional) the maximum number of assets to return. Use this value to constrain the list of recommended assets.

- `LISTVARNAME` – the name that you want to assign to the list of assets. Its columns are: `assettype` and `assetid`.

If the segment list and the promotion list have not yet been created and placed in the visitor context, this object method invokes the methods that calculate them. +Remember that promotions do not have templates—they override the template that a recommendation is using. If there are any promotions that apply to the current visitor **and** that override the recommendation named by the `COLLECTION` argument, the object method returns the ID of the promotion asset rather than the items identified by the recommendation asset.

### Note

The `COMMERCECONTEXT.GETSINGLERECOMMENDATION` object method returns one recommended asset based on the recommendation criteria passed to the method. Typical uses for this method are to feature one product or to put one product on sale. See the *CSEE Developer's Tag Reference* for information about this object method and its JSP equivalent.

Before you begin coding the templates for recommendations, be sure to complete the following tasks:

- Meet with the marketing team to define all the merchandising messages that you want to display on your site and plan how to represent those messages in recommendations and promotions.

For example, do you want to display a list of links to other products? What information should the link include? The product name only or also the price? What will be displayed when a recommendation returns a promotion rather than a list of assets?

- Determine where and on which pages the recommended assets from each recommendation will be displayed.

## Creating Templates for Recommendations

To use templates to render items that are returned by recommendation assets, you must complete at least the following basic steps:

1. Create a template element that invokes a recommendation asset. Use the object method described in the preceding section.
2. Code the template to display the items that are returned by the recommendation. The returned items are stored in a variable designated by the `LISTVARNAME` argument. This list includes the asset IDs and asset types of those items. Use that information to extract the asset attributes that you want to display. (Name, price, SKU, for example.)

You can use the `ASSETSET.SETLISTEDASSETS` and `ASSETSET.GETASSETLIST` object methods to sort and display the returned assets and their attributes.

For an example, use Content Server Explorer to examine `ElementCatalog/OpenMarket/Demos/CatalogCentre/Templates/GE/recommendation.xml`.



3. Open CS-Engage. Under **New**, select **Template**. Create a corresponding template asset for this template element. Enter a name that describes what the element does so that when you create a recommendation asset you know which template to assign to it. Identify the path to the element (its location in the ElementCatalog) in the **Element Name** field.
4. Publish the template asset when other assets are published.
5. Render the recommendations on the appropriate site pages.

## Shopping Carts and CS-Engage

The shopping cart interface is a CS-Direct Advantage feature. However, when you are using CS-Engage, there are a number of additional facts and tips to keep in mind while you code your shopping cart pages:

- If your site uses promotions, you must code your cart pages to apply the discounts from the promotions.  
Use the `COMMERCECONTEXT.DISCOUNTCART` and `COMMERCECONTEXT.DISCOUNTTEMP CART` object methods to apply promotional discounts to the shopping cart.
- It is good practice to clear existing discounts from the cart before applying them again.
- You can store carts across sessions by writing them to the database as a visitor attribute of type binary (a scalar object). Be sure to write the cart object to the database each time the cart is modified.
- If your site uses a visitor login feature, there can be conditions under which you should merge shopping carts. For example, a visitor adds products to her cart before she logs in. Then, when she logs in, CS-Engage finds a stored cart that also has items in it. In such a case, you would want to merge the carts.

For information about the `CART` object methods and their JSP equivalents, see the *CSEE Developer's Tag Reference*.

For an example of a CS-Engage shopping cart, use Content Server Explorer to examine `ElementCatalog/OpenMarket/Demos/CatalogCentre/GE/cart.xml`.

## Debugging Site Pages

During your development phase, you must verify that session linking is set up correctly, that specific attributes obtain the value that you expect, and that recommendations return the items that you expect. There are several CS-Engage object methods that you can use to retrieve and review information and values by writing information to a browser window or to the JRE log, or by examining it with the Page Debugger utility.

This section lists the Commerce Connector and Visitor Data Manager object methods that you will probably use the most. For information about these and any other XML and JSP object methods, see the *CSEE Developer's Tag Reference*.

## Session Links

Use the following Visitor Data Manager object methods to verify that pages that handle session linking are creating the aliases correctly:

- `<VDM.GETALIAS KEY="keyvalue" VARNAME="varname"/>` – retrieves an alias.
- `<VDM.GETCOMMERCEID VARNAME="varname"/>` – retrieves the visitor's Transact commerce ID from session data.
- `<VDM.GETACCESSID KEY="pluginname" VARNAME="varname"/>` – retrieves the visitor's access ID from session data.

## Visitor Data Collection

Use the following Visitor Data Manager object methods to retrieve values stored for specific visitor attributes, history attributes, and history definitions (records):

- `<VDM.GETSCALAR ATTRIBUTE="attribute" VARNAME="varname" />` – retrieves a specific visitor attribute.
- `<VDM.LOADSCALAROBJECT ATTRIBUTE="attribute" VARNAME="varname" />` – retrieves (materializes) an object stored as a visitor attribute of type binary.
- `<VDM.GETHISTORYCOUNT ATTRIBUTE="attribute" VARNAME="varname" [ STARTDATE="date1" ENDDATE="date2" LIST="constraints" ] />` – retrieves the number of history definition records that were recorded for the visitor that match the specified criteria.
- `<VDM.GETHISTORYSUM ATTRIBUTE="attribute" VARNAME="varname" [STARTDATE="date1" ENDDATE="date2" LIST="constraints"] FIELD="fieldname" />` – sums the entries in a specific field for the specified history definition.
- `<VDM.GETHISTORYEARLIEST VARNAME="varname" [ STARTDATE="date1" ENDDATE="date2" LIST="constraints" ] />` – retrieves the timestamp of the first time the specified history definition was recorded for this visitor.
- `<VDM.GETHISTORYLATEST VARNAME="varname" [ STARTDATE="date1" ENDDATE="date2" LIST="constraints" ] />` – retrieves the timestamp of the last time (that is, the most recent time) the specified history definition was recorded for this visitor.

## Recommendations and Promotions

Use the following Commerce Context object methods to verify pages that display recommendations and promotions:

- `<COMMERCECONTEXT.CALCULATESEGMENTS/>` – lists the segments that the visitor belongs to. It examines the available visitor data, compares it to the data types that define the segments, and then lists the segments that are a match.
- `<COMMERCECONTEXT.GETPROMOTIONS LISTVARNAME="promotionlist"/>` – creates the list of promotions that the current visitor is eligible for
- `<COMMERCECONTEXT.GETRATINGS ASSETS="assetlist" LISTVARNAME="ratinglist" DEFAULTRATING="defaultrating"/>` –

calculates the ratings of the assets in a named list according to how important the asset is to this visitor based on the segments that the visitor belongs to.

- `<COMMERCECONTEXT.GETSEGMENTS LISTVARNAME="segmentlist"/>` – retrieves the list of segments that the current visitor belongs to.



## Section 9

# Analysis Connector

This section explains how to use Analysis Connector to capture web site events, such as visitor activity and clickstream data, during high-traffic periods in an efficient manner.

It contains the following chapters:

- Chapter 38, “Overview of Analysis Connector”
- Chapter 39, “Using Analysis Connector”
- Chapter 40, “Analysis Connector Pages and Elements”



## Chapter 38

# Overview of Analysis Connector

This chapter presents an overview of Analysis Connector: what it is; how you use it; how it works. It contains the following sections:

- What Is Analysis Connector?
- Planning for Analysis Connector
- Implementing Analysis Connector

## What Is Analysis Connector?

Analysis Connector is a tool that allows you to capture web site events such as visitor activity and clickstream data in a highly efficient manner. The event data you want to capture normally occurs during high-traffic periods, which is not a time when you want to degrade performance by constantly writing to the database. rapidly streams large volumes of data to a queue in the Java layer. As the queue fills up, data is written to disk files. Periodically, during off-peak hours, a configurable background process loads data from the disk files into Content Server database tables.

Common events you might want to capture include the following:

- Clicks and page views
- Visitor demographic information
- Product structure information
- Cart item information
- Abandoned cart information
- Order and order item information

Analysis Connector can be installed directly on Content Server. Note, however, that you are not restricted to this single site: you can capture data from one Content Server site and store it in another site's database.

## Components

Analysis Connector consists of the following components:

- A set of .ini files to configure and manage
- Tags to administer tables, and to store and retrieve data
- Installed elements that call tags
- Installed pages through which to make HTTP requests
- A DatabaseLoader process to load event data into a Content Server database
- Five predefined default tables designed for use with CS-Engage

## How It Works

When Analysis Connector is in place on your CSEE system, this is how it works:

1. Visitors trigger actions that cause event data to be streamed to rotating data containers in a queue in the Java layer.
2. As these rotating data containers fill up with rows of data, they are written to disk files.
3. Periodically (during low traffic periods), the DatabaseLoader is run to write the disk file contents to a designated Content Server database.
4. HTTP page requests are made to output formatted data for analysis.

## Planning for Analysis Connector

Getting started with Analysis Connector requires collaboration among marketers, developers, and ancillary staff to define the problem and come up with a solution.

The planning stage typically involves these decisions:

- The marketers decide on the web site events they want to capture.
- Marketers work with developers to translate events to database entities: column names and data types.
- The development team analyzes Web pages to assess where events occur so that the corresponding data can be captured.
- Everyone estimates the volume of data that they want to accumulate. This will of course require adjustments over time.
- Those familiar with the analysis engine in use devise a suitable output formatting scheme.

Other considerations include:

- Initial queue settings for logging event data (another iterative process of fine-tuning)
- How often (and when) to load event data into the database
- When to purge data from the database tables (when is it no longer relevant)



## Implementing Analysis Connector

After the planning stage is completed, the implementation stage can begin. Briefly, it involves these tasks:

1. Define new tables in the `commercedata.ini` file.
2. Create these tables in the Content Server database.
3. Edit web site pages to include data storage tags to capture visitor information and activities.
4. Edit the other `.ini` file settings to configure for your site.
5. Edit data retrieval elements to extract data from Content Server database tables in a format suitable for analysis by the analysis engine of your choice.



## Chapter 39

# Using Analysis Connector

This chapter describes the default tables and covers some of the basic operations involved in using them. It contains the following sections:

- The Default Tables
- Creating Data Tables
- Storing Data
- Retrieving Data
- Troubleshooting
- DatabaseLoader

## The Default Tables

There are five default tables already defined in `commercedata.ini` and provided for use specifically with CS-Engage data. The five default tables are as follows:

- `cart_event`
- `orders`
- `order_item`
- `shopper`
- `shopper_map`

Although they are predefined for you, they are not created in the Content Server database until you explicitly do so by running the `OpenMarket/CommerceData/ACCreateTables` page in your browser. This page is described in Chapter 40, “Analysis Connector Pages and Elements.”

## The cart\_event Table

The cart\_event table captures add and remove item counts on web site carts. Each row contains information about the price, quantity, and ID of the product added or removed by the shopper. The table contains the following columns:

Column Name	Data Type	Description
cart_id	numeric id	Cart ID
cart_product_id	numeric id	Product ID
shopper_id	numeric id	Shopper ID
merchant_id	numeric id	Merchant ID (Store ID is used)
cart_item_quantity	integer	Number of items in action
cart_item_total	int/money/currency	Total cost of items
cart_action_id	char(1)	Action performed: A - added R - removed
date_hour	long	Time in hours, that is, the hour period when the event occurred
last_update	long	Time when the row was created

## The orders Table

The orders table captures information about order events, including who the shopper is, where purchases were made (store), and how much was spent on order items, taxes, and shipping. The table contains the following columns:

Column Name	Data Type	Description
order_id	numeric id	Unique order ID
order_num	string	Non-numeric order ID (dummy)
merchant_id	numeric id	Merchant ID (Store ID is used)
order_total	int/money/currency	Total cost of items in order
order_taxes	int/money/currency	Total tax
order_shipping	int/money/currency	Shipping cost
order_cost	int/money/currency	Total cost of items in order
order_status_id	integer	Order status; for example, pending or completed
shopper_id	numeric id	Shopper ID

Column Name	Data Type	Description
date_hour	long	Time in hours, that is, the hour period when the event occurred
last_update	long	Time when the row was created

## The order\_item Table

The `order_item` table contains information about individual items in each order. The table contains the following columns:

Column Name	Data Type	Description
orditem_id	numeric id	Order item ID
shopper_id	numeric id	Shopper ID
merchant_id	numeric id	Merchant ID (Store ID is used)
order_id	numeric id	Order ID
product_id	numeric id	Product ID
orditem_quantity	integer	Product quantity of this product purchased in this order
orditem_total	int/money/currency	Total cost of item
orditem_cost	"0"	Unused
date_hour	long	Time in hours, that is, the hour period when the event occurred
last_update	long	Time when the row was created

## The shopper Table

The `shopper` table captures demographic information about the shopper. The table contains the following columns:

Column Name	Data Type	Description
shopper_id	numeric id	Shopper ID (alias from CS-Engage)
shopper_name	char(80)	Shopper name
shopper_type_id	char	Shopper type: guest registered privileged

Column Name	Data Type	Description
gender_id	char	Gender
Age	integer	Age
Income	int/money/currency	Income
marital_id	string	Marital status
nbr_children	integer	Number of children
hhold_size	integer	Household size
Company	char(255)	Company name
area_code	char(255)	Area code
zip_code	char(255)	Zip code
City	char(255)	City
State	char(255)	State
Region	char(255)	Region
Country	char(255)	Country ID
Email	char(255)	Email address
Transactions	integer	Number of transactions
total_sales	int/money/currency	Total sales
Lastvisit	long	Time of last visit
Lastorder	long	Time of last order
date_hour	long	Time in hours, that is, the hour period when the event occurred
last_update	long	Time when the row was created

## The shopper\_map Table

The shopper\_map table holds information linking the different IDs assigned to the shopper when visiting the site. Usually the name and value of a persistent cookie accepted by the shopper is stored here to track and recognize the shopper on a visit. The table contains the following columns:

Column Name	Data Type	Description
shopper_id	numeric id	Shopper ID
alias_identifier	char(80)	Name of persistent cookie
alias_value	char(255)	Cookie or alias value

Column Name	Data Type	Description
alias_validity	long	Number of seconds the cookie is valid
last_update	long	When row was created
visitor_id	numeric id	Visitor ID from CS-Engage
session_id	char(255)	Application server session ID

## Creating Data Tables

ships with five default table definitions specifically for use with CS-Engage. You can create your own tables as well for storing logged data that you define. To create your own tables, you must do the following:

- Define new tables in the `commercedata.ini` file following the definitions of the default tables. The information that you need to provide is described in the Analysis Connector section of the *CSEE Administrator's Guide*.
- Create defined tables, including default tables, by running the `OpenMarket/CommerceData/ACCreateTables` page in your browser. This page is described in Chapter 40, "Analysis Connector Pages and Elements."

## Storing Data

You store data in Analysis Connector tables by calling the `CDM.WRITECOMMERCEADATA` tag within the HTML that generates your web site pages. You place the tag within the HTML code to capture events as they happen on the page. The tag must specify the correct column names and receive input data of the associated data types defined in `commercedata.ini`.

The `CDM.WRITECOMMERCEADATA` tag streams the data in rows to the queue, where the rows are placed into rotating files, and these rotating files are written to disk files for eventual loading into the Content Server database.

The `CDM.WRITECOMMERCEADATA` tag is described in the *CSEE Developer's Tag Reference*.

## Retrieving Data

You retrieve data from Analysis Connector (default and user-defined) tables by running the `OpenMarket/CommerceData/GetCommerceData` page in your browser. You include as part of the URL, the table name from which you want to retrieve the data, and a range of dates within which the table row creation date must fall. The page calls a root element of the same name, which in turn calls one of four elements, based on the table name specification.

When the named table is an Analysis Connector (default or user-defined) table, the called element returns matching rows of data in tab-separated columns by default. You can edit

this element (`OpenMarket/CommerceData/retrieve/GetDataFromTable`) to retrieve the output in a format suitable to the analysis engine you are using. For more information, see Chapter 40, “Analysis Connector Pages and Elements.”

## Troubleshooting

Analysis Connector error messages are logged to the Java logs; they are not displayed in the browser. Consequently, you should test the entire process—from table creation to requesting output—to ensure proper setup. For example, when capturing data (`CDM.WRITECOMMERCE`DATA), writes an error message to the Java logs if the named table does not exist. You would know this only if you check the logs.

Similarly, when capturing data, `CDM.WRITECOMMERCE`DATA requires that a parameter be specified for each column in the named table, including columns that accept NULL values. An error condition results if all columns are not accounted for. NULL values must be represented as `colname="0"`; if `colname=" "` is specified, the tag substitutes zero. FatWire recommends that you do not use NULL columns.

Make sure the data types declared in a new table definition are accepted by the database. This is a typical cause of table creation failure. Likewise, you need to make sure that the data you look to capture with the `CDM.WRITECOMMERCE`DATA tag is consistent with the data types of the columns to which this data will be written.

## DatabaseLoader

The DatabaseLoader process is provided to load the data written to disk files from the queue into the appropriate Content Server database. The process is designed to run in background, performing incremental updates. Remember that the process of streaming data to the queue is in place for efficiency and to avoid writing to the database during high traffic periods. Consequently, you want to schedule the DatabaseLoader to run when database activity is minimal.

When invoked, the DatabaseLoader checks the `databaseloader.ini` file to determine the Content Server installation it is updating. The process also checks the `writequeue.ini` file for the location of the disk files and file extension to look for. Finally, DatabaseLoader checks `commercedata.ini` to validate table definitions.

The DatabaseLoader then processes each disk file in a transactionally safe manner, writing each row to the appropriate table in the designated Content Server database. A disk file is not deemed finished until all database writes have been committed.

To run the DatabaseLoader, invoke the following command manually or via a cron job:

- UNIX

```
java -classpath path:installdir/cs.jar:
installdir/commercedata.jar:installdir/basic.jar
com.openmarket.DatabaseLoader.main
-finstalldir/databaseloader.ini
com.openmarket.DatabaseLoader.main
-finstalldir/databaseloader.ini
```

- Windows

```
java -cp path;installdir\cs.jar;
```



```
installldir\commercedata.jar;installldir\basic.jar
com.openmarket.DatabaseLoader.main
-finstallldir\databaseloader.ini
```

The DatabaseLoader must point to the same Java command and classes as those in the application server path. Also, the path to the JDK must be the same as the application server JDK path. A sample UNIX invocation might be as follows:

```
/local/jdk1.3/bin/java -classpath /local/jdk1.3/lib/classes.zip:
/local/export/FutureTense/cs.jar:
/local/export/FutureTense/commercedata.jar:
/local/export/FutureTense/basic.jar
com.openmarket.DatabaseLoader.main
-f/local/export/FutureTense/databaseloader.ini
```

#### Note

These command formats have carriage returns for readability. In use, you would specify the command on a single line or use continuation characters.

If you want to get help on the command format, use the `-h` option instead of `-f`. You can also turn debugging on by appending `-dtrue` to the end of the command (`-dfalse` is the default).



## Chapter 40

# Analysis Connector Pages and Elements

Analysis Connector delivers several elements. Each element has a page entry in the `SiteCatalog` table. You use these elements to create tables, write data to those tables, and clear data from them.

This chapter contains the following sections:

- Analysis Connector Pages
- Elements

## Analysis Connector Pages

When Analysis Connector is installed, the following page entries are created in the `SiteCatalog` table:

- `OpenMarket/CommerceData/ACCreateTables`
- `OpenMarket/CommerceData/FlushTableRows`
- `OpenMarket/CommerceData/GetCommerceData`
- `OpenMarket/CommerceData/ACUpgradeTables`

The name of the root element (in the `ElementCatalog` table) for each page entry matches the name of the page entry. For example, the root element for the `ACCreateTables` page entry is: `ElementCatalog/OpenMarket/CommerceData/ACCreateTables`.

Note that in order to run any of these Analysis Connector pages, you must be logged into Content Server as a user who has the `SiteGod` and `VisitorAdmin` roles and then run the pages from within the same browser session.

## The OpenMarket/CommerceData/ACCreateTables Page Entry

Render this page to create the default tables and any user-defined tables in the `commercedata.ini` file. The tables are created in the Content Server database according to the column names and data types associated with the table name in `commercedata.ini`.

The HTTP syntax of the page request varies depending on the application server used:

- For servlet architectures, including Sun ONE Application Server:

```
http://localhost:port/servlet/
ContentServer?pagename=OpenMarket/CommerceData/ACCreateTables
```

- For the iPlanet Application Server (iAS):

```
http://localhost:port/NASApp/cs/
ContentServer?pagename=OpenMarket/CommerceData/ACCreateTables
```

### OpenMarket/CommerceData/FlushTableRows

Run this page to flush data from the specified default or user-defined table based on a date comparison. All rows with a `last_update` (creation) date on or before the specified date will be purged.

The HTTP syntax of the page request varies depending on the application server used:

- For servlet architectures including Sun ONE Application Server:

```
http://localhost:port/servlet/
ContentServer?pagename=OpenMarket/CommerceData/
FlushTableRows&tables=table1%20table2%20tablen&thru=yyyy-mm-
ddhh:mm:ss
```

- For the iPlanet Application Server (iAS):

```
http://localhost:port/NASApp/cs/
ContentServer?pagename=OpenMarket/CommerceData/
FlushTableRows&tables=table1%20table2%20tablen&thru=yyyy-mm-
ddhh:mm:ss
```

## The OpenMarket/CommerceData/GetCommerceData Page Entry

Run this page to retrieve data from the specified table based on a date comparison. All rows with a `last_update` (creation) date that falls within a date range are retrieved.

The HTTP syntax of the page request varies depending on the application server used:

- For servlet architectures, including Sun ONE Application Server:

```
http://localhost:port/servlet/
ContentServer?pagename=OpenMarket/CommerceData/
GetCommerceData&table=tablename&from=yyyy-mm-
ddhh:mm:ss&thru=yyyy-mm-ddhh:mm:ss
```

- For iPlanet Application Server (iAS):

```
http://localhost:port/NASApp/cs/
ContentServer?pagename=OpenMarket/CommerceData/
GetCommerceData&table=tablename&from=yyyy-mm-
ddhh:mm:ss&thru=yyyy-mm-ddhh:mm:ss
```

## The OpenMarket/CommerceData/ACUpgradeTables Page Entry

You use this page to upgrade the default and user tables when upgrading from earlier versions of Analysis Connector. You can also run this page to add new columns to existing tables.

The HTTP syntax of the page request varies depending on the application server used:

- For servlet architectures, including the Sun ONE Application Server:

```
http://localhost:port/servlet/
ContentServer?pagename=OpenMarket/CommerceData/
ACUpgradeTables&tables=tablelist
```

- For iPlanet Application Server:

```
http://localhost:port/NASApp/cs/
ContentServer?pagename=OpenMarket/CommerceData/
ACUpgradeTables&tables=tablelist
```

Specify the tables you want to upgrade as a space-separated list of table names. Note the following about upgrading tables:

- The specified tables must already exist.
- Temporary tables are created based on the current definition (`commercedata.ini`), and existing data is copied into these temporary tables.
- New tables are created in the Content Server database based on their current definitions.
- Data is copied from the temporary tables into the upgrade tables, and the temporary tables are deleted.

### Note

The new schema must be a superset of the old schema. Any new columns introduced to existing tables cannot be defined as NOT NULL: there will be no data to copy from the existing tables, so null values must be acceptable.

## Elements

Analysis Connector delivers the following elements:

- `OpenMarket/CommerceData/ACCreateTables`
- `OpenMarket/CommerceData/FlushTableRows`
- `OpenMarket/CommerceData/GetCommerceData`
- `OpenMarket/CommerceData/ACUpgradeTables`

These are the root elements of the installed live pages described in the “Analysis Connector Pages” section.

- `OpenMarket/CommerceData/WriteExampleData`

This element writes sample data to the default tables; it can be called on a test page as an example.

- `OpenMarket/CommerceData/retrieve/GetAbandonedCarts`

- `OpenMarket/CommerceData/retrieve/GetCategories`
- `OpenMarket/CommerceData/retrieve/GetDataFromTable`
- `OpenMarket/CommerceData/retrieve/GetProdCats`

One of these elements is called by the `OpenMarket/CommerceData/GetCommerceData` element, based on the `table=` value.

## Retrieval Elements

A page request to `OpenMarket/CommerceData/GetCommerceData` generates a call to the root element `OpenMarket/CommerceData/GetCommerceData`, which calls one of four elements, based on the table name specified (`table=tablename`). In each case, The `OpenMarket/CommerceData/GetCommerceData` element also calls the `CDM.CONVERTDATETOLONG` tag to convert dates specified in the format `yyyy-mm-ddhh:mm:ss` to dates in long format, that is, in milliseconds from the epoch. The four possible elements are described in the following sections.

### OpenMarket/CommerceData/retrieve/GetAbandonedCarts

This element is called by `OpenMarket/CommerceData/GetCommerceData` when `table=abcart`. The element uses the `COMMERCECONTEXT.GETSESSIONCART` and `COMMERCECONTEXT.GETABANDONEDCARTSESSIONS` tags to access abandoned cart information, which is stored in the scratch table. The element returns all abandoned carts that contain at least one item, using one row per item, where each row contains the following columns:

- `abcart_id`
- `product_id`
- `merchant_id (store_id)`
- `quantity`
- `total`
- `last_update`

The cart session timestamp must fall within the specified date interval for the cart to be returned. This element requires that CS-Direct Advantage and CS-Engage be installed.

### OpenMarket/CommerceData/retrieve/GetDataFromTable

This element is called by `OpenMarket/CommerceData/GetCommerceData` when the value for `table=` is any of the default or user-defined tables. The element calls the `CDM.GETTABLEDEF` tag to create a list of column names specific to the named table. Next, the element calls the `CDM.GETCOMMERCEDATA` tag to retrieve information from the named table in the Content Server database based on a `last_update` that falls within the specified interval. The data is returned in rows of tab-separated columns corresponding to the named table. You can edit the element to format data in compliance with the analysis engine you are using.

## OpenMarket/CommerceData/retrieve/GetCategories

This element is called by `OpenMarket/CommerceData/GetCommerceData` when `table=category`. The element retrieves all product parents in the `ProductGroups` table that have been updated (`updateddate` column) within the specified date interval. Each row contains the following columns:

- `category_id` (product parent id)
- `category_name` (product parent name)
- `last_update`

This element requires that CS-Direct Advantage be installed.

## OpenMarket/CommerceData/retrieve/GetProdCats

This element is called by `OpenMarket/CommerceData/GetCommerceData` when `table=product`. The element retrieves all products in the `Products` table with an `updateddate` value that falls within the specified date interval. Each row contains the following columns:

- `product_id`
- `product_name`
- `last_update`

This element requires that CS-Direct Advantage be installed.

## OpenMarket/CommerceData/WriteExampleData

This element demonstrates how data is written to each of the default tables when called from a user page. The current data is dummy data; you have to supply actual data.

```
<?XML VERSION="1.0" ?>
<!DOCTYPE FTCS SYSTEM "futuretense_cs.dtd">
<FTCS Version="1.1">
<!-- OpenMarket/CommerceData/WriteExampleData
--
-- INPUT
--
-- OUTPUT
--
-->

    <!-- Examples of use of tag writecommercedata for default
    installed tables

        Note that the column names of the table are the
        parameter names for each tag and
        that the data type is as per the declaration in
        commercedata.ini -->

        <!-- make a long date -->
        <DATE.CLOCKLIST LISTVARNAME="lst"/>
        <SETVAR NAME="date" VALUE="lst.clock"/>

        <CDM.WRITECOMMERCEADATA TABLENAME="shopper_map"
```

```

shopper_id="CS.UniqueID"
    alias_identifier="cookieid"
    alias_value="goodluckfromsteve"
    alias_validity="800000"
    session_id="abg1234"
    last_update="Variables.date"/>

<CDM.WRITECOMMERCE DATA TABLENAME="cart_event"
    cart_id="CS.UniqueID"
    cart_product_id="CS.UniqueID"
    shopper_id="CS.UniqueID"
    merchant_id="CS.UniqueID"
    cart_item_quantity="5"
    cart_item_total="200.00"
    cart_action_id="A"
    date_hour="Variables.date"
    last_update="Variables.date"/>

<CDM.WRITECOMMERCE DATA TABLENAME="shopper"
    shopper_id="CS.UniqueID"
    shopper_name="John Doe"
    shopper_type_id="1"
    gender="M"
    age="32"
    income="100000"
    marital_status="Divorced"
    nbr_children="2"
    hhold_size="3"
    company="Open Market"
    area_code="781"
    zip_code="01803"
    city="Burlington"
    state="MA"
    country="USA"
    region="NE"
    email="jd@openmarket.com"
    total_sales="1000"
    transactions="4"
    lastvisit="981440130184"
    lastorder="981440130184"
    date_hour="Variables.date"
    last_update="Variables.date"/>

<CDM.WRITECOMMERCE DATA TABLENAME="orders"
    order_id="CS.UniqueID"
    order_num="0"
    order_total="100"
    order_taxes="6"
    order_shipping="4"
    order_cost="0"

```



```
order_status_id="1"  
shopper_id="CS.UniqueID"  
merchant_id="CS.UniqueID"  
date_hour="Variables.date"  
last_update="Variables.date"/>
```

```
<CDM.WRITECOMMERCEDATA TABLENAME="order_item"  
  orditem_id="CS.UniqueID"  
  order_id="CS.UniqueID"  
  product_id="CS.UniqueID"  
  orditem_cost="0"  
  orditem_total="100"  
  orditem_quantity="6"  
  shopper_id="CS.UniqueID"  
  merchant_id="CS.UniqueID"  
  date_hour="Variables.date"  
  last_update="Variables.date"/>
```

```
</FTCS>
```



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