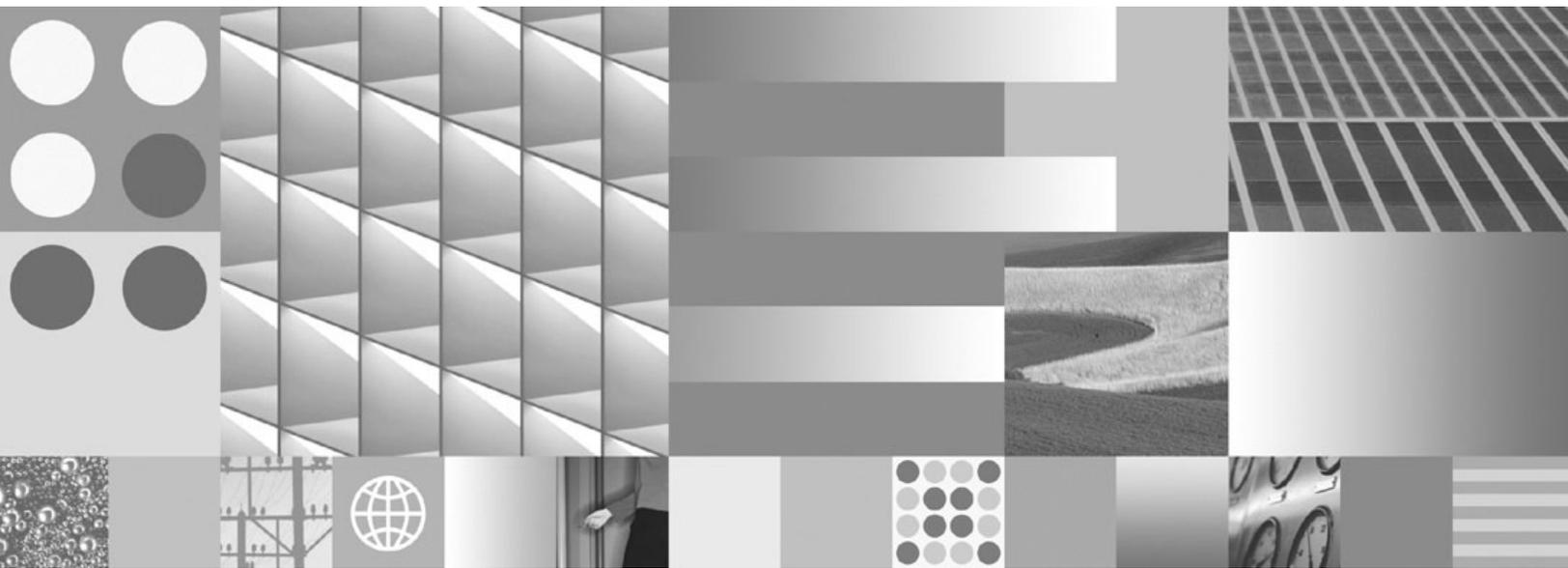


## Planning and Configuration Guide





## Planning and Configuration Guide

**Note**

Before using this information and the product it supports, read the information in "Notices" on page 49.

**This edition applies to version 4.5 of IBM FileNet Content Manager (program number 5724-R81), and to all subsequent releases and modifications until otherwise indicated in new editions.**

**© Copyright International Business Machines Corporation 2008.**

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

# Table of Contents

<b>Overview</b> .....	<b>5</b>
<b>Planning Your CFS-IS Configuration</b> .....	<b>7</b>
System Administrator Tasks .....	7
Strategy .....	7
CFS-IS User Account .....	8
Document Classes .....	8
Conversion from IS to CE .....	8
Exporting IS Properties for an Application .....	8
Update and Export .....	10
Domain Validation .....	10
Remote Admin Console .....	10
Relational Database Configuration .....	11
RDBMS Considerations .....	11
Upgrade Strategy .....	11
Compatibility .....	11
System Property Mapping .....	12
System Property Updating .....	12
Mapping Properties from CE to IS .....	13
Mapping Document Classes from CE to IS .....	13
Document Class Names .....	13
Launching Workflows .....	14
<b>Configuring CFS-IS</b> .....	<b>15</b>
CFS-IS Configuration Road Map .....	15
All Windows Servers (Both CE and IS) .....	16
Verify TCP/IP Parameter Settings on Windows Servers .....	16
Image Services System .....	18
Create a CFS-IS Administrative User .....	18
Create a Group for CFS Record Management .....	19
Configure Record Management Security .....	19
Define Document Classes for CFS-IS .....	20
Determine Document Property Mapping between IS and CE .....	20

Numeric Ranges . . . . .	22
Mapping Numeric Data Types . . . . .	22
Multi-valued CE Properties . . . . .	23
<b>Content Engine Server . . . . .</b>	<b>23</b>
Communication Between CE and IS . . . . .	23
IS Domain Names versus Server Names . . . . .	24
Creating a Four-Part NCH Service Name . . . . .	24
Modifying the Hosts File . . . . .	25
Using a Name Resolution Service Server . . . . .	25
Communicating Through a Firewall . . . . .	25
Verify the Connection Between CE and IS . . . . .	26
Launch Enterprise Manager . . . . .	26
Create an Object Store . . . . .	26
Create a Fixed Content Device in EM . . . . .	27
Default IS Document Class . . . . .	27
CFS Server for Image Services . . . . .	27
Complete the Create a Fixed Content Device Wizard . . . . .	27
Editing a Fixed Content Device . . . . .	28
Domain Root Properties . . . . .	28
Properties: General . . . . .	28
Properties: Site Settings . . . . .	28
Creating a Fixed Storage Area . . . . .	28
Specify a Site . . . . .	28
Name and Describe the Storage Area . . . . .	28
Specify the Storage Area Type . . . . .	29
Fixed Storage Area . . . . .	29
Select the Size Parameters of the Storage Area . . . . .	29
Specify Storage Policy . . . . .	29
Complete the Create a Storage Area Wizard . . . . .	29
Content Engine Service Shutdown Sequence . . . . .	30
<b>Property Mapping . . . . .</b>	<b>30</b>
Image Services . . . . .	30
Add/Edit External Class Mapping . . . . .	30
Add/Edit External Property Mapping . . . . .	31
Marking Set . . . . .	31
Create a Marking Set . . . . .	32
Create a Property Template . . . . .	33
Add the Property to a Document Class . . . . .	33
<b>Annotations . . . . .</b>	<b>34</b>
Configure the Annotation Export . . . . .	34
Exporting Annotations . . . . .	35
Annotation Security Mapping . . . . .	35
Mapping User and Group Security for Annotations . . . . .	36
Activating CFS-IS Annotation Security Mapping . . . . .	36
IS Users with Special Privileges . . . . .	37

Supported Actions on Annotations .....	38
CFS Connector - IS Catalog Export .....	38
Maximum DIR Size .....	38
Catalog Export for Newly Captured IS Documents .....	39
Configure a Document Class for Export .....	39
Catalog Export for Existing Documents and Annotations .....	39
Federation of active and closed documents .....	39
Configure a Document Class for Export .....	41
Export Log .....	41
Exporting Report Manager Document Properties .....	42
COLD Document Support .....	42
Remote Caching .....	42
Performance issues for remote caching .....	43
Configuration on a CFS-IS system .....	44
Configuration on a satellite CFS-IS system .....	44
Application Engine Configuration .....	44
Content Engine configuration .....	44
Test the CFS-IS Configuration .....	46
Tools .....	47
nslookup .....	47
ping .....	48
<b>Notices .....</b>	<b>49</b>
Trademarks .....	50
U.S. Patents Disclosure .....	51



## Overview

CFS-IS acts as a bridge that enables you to use FileNet P8 applications on Content Engine and Panagon applications on Image Services to store content on Image Services systems and subsequently retrieve and view that content on Content Engine servers using FileNet P8 applications such as Workplace. You can search, catalog, classify, secure, retain, comply, activate, update and delete content residing in numerous heterogeneous repositories across the enterprise.



# Planning Your CFS-IS Configuration

Before you install and configure a CFS-IS system, plan the system architecture and data flow.

## System Administrator Tasks

The following list summarizes the tasks the system administrator is responsible for completing before CFS-IS is configured.

- Determine document data flow for capture and retrieval of documents stored in IS. Include capturing documents on the IS system and capturing documents on the CE server. Include retrievals on both systems. Determine throughput requirements and the maximum volume and number of documents you expect to maintain online.
- Determine the hardware architecture needed to support processing requirements.
- Use IS Security Administration to define a CFS-IS user account in IS for each CE to IS connection, and make that account a member of all relevant groups in the IS security database. The CFS-IS user name is stored in the CE Global Configuration Database (GCD) when you use Enterprise Manager (EM) to define the Fixed Context Device.
- Use EM to define the corresponding Fixed Content Device for each CE to IS connection.
- Determine the document classes you will need on both CE and IS. For CE document classes, have one document class for all IS systems. Under that name, have a name for each related IS system. Under the name of each related IS system, have a document class corresponding to the document class in the associated IS system. Determine if document properties will be kept on both CE and IS systems or just on the CE system. Determine the property mapping between CE document properties and IS document properties.
- Use IS administration tools to define the necessary document class in IS to set the security and the destination IS family for each new FileNet P8 Platform application storing documents in IS.
- Determine the schedule of exporting the existing IS catalog entries, and then determine the schedule of exporting from the Panagon application to the corresponding FileNet P8 Platform application.
- Determine the grace period during which the entries in the IS catalog are kept.
- Use EM to put the CE to IS property and document class mappings into effect.

## Strategy

To protect the integrity of your data, carefully plan the configuration of the IS catalog and Panagon applications and the CE catalog and FileNet P8 Platform applications.

## CFS-IS User Account

For CFS-IS to operate, the IS system administrator needs to create a CFS-IS user account on the IS system. The CFS-IS user must be a member of all the appropriate IS security groups. After this user is created, the CFS-IS user name will be entered into the CE Global Configuration Database (GCD) automatically when you define the Fixed Content Device using EM.

## Document Classes

The document class is the basis of connecting CE to the IS content storage area. Documents created by FileNet P8 Platform applications will be assigned the security and the family (which determines the type of physical media) of the IS document class when mapped to the appropriate class on the IS system. Thus, the physical media on which the document content is stored is transparent to CE.

If you store content in IS using a FileNet P8 application that previously has not been stored content in IS, then the IS administrator needs to create a specific document class in IS for that application to use. Creating a separate document class for each application simplifies the task of organizing your data.

The best practice is to take advantage of the CE document class hierarchy. Using Enterprise Manager (EM), you can create a document class that will act as the parent for all document classes mapped to IS content storage areas. Under this document class, create one document class per IS system that is associated with the CE catalog. Under these document sub-classes, create one document class for each existing IS document class that is mapped to the CE catalog. For each mapped document class, you must map the properties that are to be exported from IS to CE.

## Conversion from IS to CE

You should plan to export the IS properties for documents created by one application at a time.

### *Exporting IS Properties for an Application*

To export IS properties for an application, you must export the properties for all document class(es) associated with that application. First, you need to identify all the document classes needed by the application. Then, for each document class, you need to identify the IS properties that need to be sent to the CE catalog. Using Enterprise Manager, you can create and map the CE versions of the properties and document classes to their IS counterparts.

After CFS-IS is fully configured, CFS-IS automatically propagates the catalog entries of new documents added to IS document classes that are mapped to CE document classes to the CE catalog.

You can copy the catalog entries of existing IS documents to the CE catalog by running the IS Catalog Export Tool on the IS Remote Admin Console.

If you do not have Panagon applications that need to access the documents, and once the IS document properties have been copied to the CE catalog, you can disable IS cataloging for the

document classes involved. To delete the IS document properties for those document classes, you can re-export the IS document properties and specify “delete after export.”

Prior to the conversion from Panagon applications to P8 Platform applications, you must still use the Panagon applications. Therefore, you must not disable cataloging for the document classes involved until all the relevant catalog entries have been copied to the CE catalog.

During the export of existing IS document properties, you can use a FileNet P8 Platform application. However, use the FileNet P8 Platform application in read-only mode prior to the conversion because property updates made through FileNet P8 Platform applications will not propagate back to the catalog entry in the IS catalog.

During the transition from Panagon applications to FileNet P8 Platform applications, CFS-IS operates as follows:

- New documents entered through CE that have content stored in IS will have a catalog entry only in CE.
- New documents entered through IS have a catalog entry in both IS and CE. Do not disable cataloging in the IS catalog for the affected document classes until the conversion has been complete for a reasonable length of time.
- If the properties in a catalog entry in the CE catalog are updated through FileNet P8 platform applications, the update is NOT propagated to the dual catalog entry in the IS catalog. The property values on CE and IS will be out of synchronization and this mismatch must be resolved by the system administrator.
- If the properties in a catalog entry in the IS catalog are updated through an application such as IDM Desktop or Image Services Toolkit, the update is automatically propagated to the dual catalog entry in the CE catalog.

However, if any of the mapped properties in the dual catalog entry in the CE catalog have been modified on the CE system by any means other than by the IS Import Agent, the update propagated from IS will fail and an error will be logged. The property values on CE and IS will be out of synchronization and this mismatch must be resolved by the system administrator.

- Document properties can be re-exported from IS to CE at any time by running the IS Catalog Export Tool on a RAC workstation. This is especially important if the property mapping has been changed.

However, if any of the mapped properties in the dual catalog entry in the CE catalog have been modified on CE by any means other than by the IS Import Agent, those modifications will be lost because the CE properties are overwritten by the IS properties.

- If the deletion of a document is initiated on IS, the delete propagates to the CE catalog. Thus, the document is automatically deleted on both systems.
- If the deletion of a document is initiated on CE, the delete propagates to the IS catalog. Thus, the document is automatically deleted on both systems.

## Update and Export

The distinction between “update” and “export” is subtle, but important. In both cases, document properties are copied from IS to CE. Updating involves a comparison of IS and CE properties, while exporting does not involve a comparison.

When mapped document properties are **updated** on IS through an application such as IDM Desktop or Image Services Toolkit, the IS and CE properties are compared with each other to make sure they are identical before the update is performed. If they are not identical, a mismatch error is reported on both CE and IS. The system administrator must resolve the difference.

When mapped document properties are first **exported** from IS to CE by means of the Catalog Export Tool on a RAC workstation, they are synchronized on both IS and CE. However, any subsequent changes made to CE properties by FileNet P8 applications are not sent back to IS. If later you re-export the properties from IS to CE, the Catalog Export Tool does not make any comparisons, the IS properties overwrite the CE properties, and any updates to those CE properties are lost.

To prevent the mapped CE properties from inadvertently being modified and becoming mismatched with the corresponding IS properties, create a Marking Set to protect the CE document class.

## Domain Validation

The Content Engine host and the Application Engine host should reside in the **same Windows domain**. The Content Engine’s Enterprise Manager must also be in the **same Windows domain** as the FileNet P8 domain servers.

If the FileNet P8 domain’s relational database is Microsoft® SQL Server, the database server should also be in the **same Windows domain**.

The Global Configuration Database (GCD) is located on the master GCD server where the FileNet P8 domain is first created. When you configure other Content Engine systems in a CE farm configuration, you must enter the name of the master GCD server.

When a satellite Content Engine system links to a main Content Federation Services system over a wide area network (WAN) and is also configured with an Image Services Application server with cache services linked to the Root server of the main Image Services system, the Content Engine system must be in the **same IS domain** as the Image Services system.

## Remote Admin Console

The Remote Admin Console is a Windows PC workstation that is linked to the Image Services system and is used to administer certain functions of Image Services.

- The Remote Admin Console requires Image Services Toolkit.
- The Remote Admin Console workstation should be located in a place that’s easily accessible by the CFS-IS administrator.
- The Remote Admin Console **can** be configured on the same Windows server as Content Engine 4.0 and higher.

The Remote Admin Console **cannot** be installed on a server with Image Services, such as an IS server or an Application Engine server.

## Relational Database Configuration

### RDBMS Considerations

- If you install the Content Engine and Image Services relational databases on the same remote server, install the databases as **separate instances**. If performance is an issue, place the databases on separate servers.
- Oracle instances must be the same base release, although the fourth digit of the release number can be different.
- A Microsoft SQL Server instance used by Image Services cannot be shared by the Content Engine server.
- A Microsoft SQL Server instance with **Windows Authentication** that is used by Content Engine servers must have a Content Engine Servers group with privileges for: System Administrators, Security Administrators, and Database Creators roles.

A Microsoft SQL Server instance with **SQL Server authentication** that is used by Content Engine servers must have a user (such as the SQL Login db user) with privileges for: System Administrators, Security Administrators, and Database Creators roles.

These privileges are needed to create an object store successfully.

- The Microsoft SQL database must be created with case sensitive sort order.

### Upgrade Strategy

Image Services and Content Engine can share relational database software that resides on a separate remote database server.

For example, instead of having the Content Engine catalog database and the Image Services catalog database on separate servers, you can have two separate instances of the RDBMS software on one remote database server.

**NOTE** Two separate instances (installations) of the relational database software would be required in the event that a future release of Image Services supported a different version of the RDBMS software than the Content Engine.

### Compatibility

The CE and IS systems can use different relational database management systems with one consideration: If document properties are going to be exported from an IS system using one RDBMS to a CE system using a different RDBMS, the Database Administrator needs to make sure the IS document properties are compatible with the RDBMS on the CE system.

- **String Properties:** Make sure the CE string property template is large enough to contain the maximum IS string size.
- **Numeric Properties:** Make sure the CE data type that is mapped to the IS Numeric data type is large enough to hold the value from the IS Index. CE integers are signed integers which have a range of -2,147,483,648 to 2,147,483,647. If the IS Numeric Index has values outside of this range, then you must use the CE Float data type; otherwise, the Import Agent will log the overflow error and terminate.

Note that floating point numbers that are not integers do not necessarily have an exact binary representation. Therefore, you could experience some loss of precision during the conversion process.

In addition, due to the floating point representation in the CE database, and implementation limitations, the maximum number of digits for an integer that can be represented is approximately 15. Integers with more than 15 digits will experience loss of precision.

- **Date Properties:** Invalid data in date fields can cause the CFS-IS service to terminate. For example, the earliest date Content Engine supports is 1/1/1753 00:00:00 UTC. You can either:
  - Use the defaults on the CE document class to populate the corresponding CE date field, rather than mapping the IS date field to the CE date field.
  - or -
  - Repair the date field on Image Services before exporting it by changing it manually, or by running SQL scripts or stored procedures.

Dates prior to 01/01/1601 cause the Import Agents to terminate due to an error from the MS date conversion routine. Dates between 01/01/1601 and 12/31/1752 are stored as 01/01/1753 by the CE database. Dates after 01/01/1753 are fully supported.

- **Menu Properties:** The CFS-IS transfers only the values in the IS catalog database to the Content Engine catalog database. Create choices and choice lists on the Content Engine that have corresponding menu property values and descriptions to ensure that applications continue to display similar choices to the user.

## ***System Property Mapping***

Map the Image Services document ID number to a floating point number on the Content Engine system. The IS document ID field can hold a value of up to 4,000,000,000. Because this is a much larger value than the 32-bit signed integer Content Engine property can hold, the Enterprise Manager allows the IS document ID to be mapped only to the Float data type.

## ***System Property Updating***

IS document properties that are mapped to CE properties can be updated on the Content Engine system, but the updates are not sent to the Image Services system.

## Mapping Properties from CE to IS

In both CE and IS systems, there is a global pool of properties defined. The first step in establishing the mapping between a CE object store and an IS system is to establish the global pool of properties on both systems.

Using Enterprise Manager running on CE, you must define a correspondence between CE properties and IS properties. In making this correspondence, the type of the properties being associated with each other must be equivalent. For example, there is no type conversion provided between numeric and string properties. In a pair of mapped properties, both must be numeric, or both must be string properties.

## Mapping Document Classes from CE to IS

In both CE and IS systems, the properties of a document class are drawn from the global pool of properties.

There are system defined properties, and user defined properties. System defined properties include document number or document ID, and entry date. User defined properties include account number, address, and so on.

## Document Class Names

Document class names in a CE object store are hierarchical names. Document class names in an IS catalog database are in a flat name space.

You can take advantage of the hierarchical nature of CE document class names as follows.

- Assuming some appropriate initial part of the name, make the second part of the document class name be a constant, such as "IS".
- Make the third part of the name the same as the domain name of the associated IS system.
- The last part of the name should be the associated document class name on the IS system.

In that way, the document class name correspondence is very clear and extensible.

For example, suppose you determine that an appropriate prefix for CE document class names in a particular object store is "/A/B". Then suppose that there are two associated IS systems whose domain names are "sunlamp" and "roadrunner." Suppose you want to map document classes "loan\_applications" and "termite\_reports" on sunlamp, and "ins\_policy" and "clients" on roadrunner. Then you would define the following four document classes in the CE object store:

```
/a/b/IS/sunlamp/loan_applications
```

```
/a/b/IS/sunlamp/termite_reports
```

```
/a/b/IS/roadrunner/ins_policy
```

```
/a/b/IS/roadrunner/clients
```

Now, the mapping between CE and IS document classes that you must accomplish with the FileNet P8 Platform application Enterprise Manager is very clear. You must map the CE document

class “/a/b/IS/sunlamp/loan\_applications” with the IS document class “loan\_applications” on the IS system whose domain is “sunlamp”.

In many cases there will be existing IS document classes that must be mapped to newly created CE document classes.

In addition, if there are new FileNet P8 Platform applications that have never run on IS and are going to use IS as a fixed storage area, then new document classes must be created on the IS system and mapped to the corresponding CE document classes. The new IS document classes must be created by the IS administrator to provide a place to store the access restrictions and the IS primary family of the documents that will be stored on the IS system by the FileNet P8 Platform applications.

## Launching Workflows

Follow the steps below to move an IS document class to the CE catalog when workflows are used.

- Define the associated CE document class so that no FileNet P8 workflows are launched when new documents are inserted.
- Start exporting catalog entries from the IS catalog to the CE catalog. Keep using the Panagon applications and the Panagon workflows until you export a critical mass of catalog entries from the IS catalog to the CE catalog.
- After you export a critical mass of catalog entries to the CE, switch from the IS catalog and Panagon applications to the CE catalog and FileNet P8 Platform applications. As part of the conversion, define the conditions on the CE document classes that result in launching workflows on the CE system, and stop workflows from being launched on the IS system.

## Configuring CFS-IS

When the Content Engine (CE), Image Services (IS), and Remote Admin Console (RAC) software has been successfully installed on the appropriate servers, you can begin configuring the IS-CE connection.

You'll need to:

- Create a document class on IS for each type of document you wish to catalog on CE.
- Define dedicated users on each IS and CE server.
- Configure a Fixed Content Device on CE for each IS server you wish to communicate with.
- Create a document class on CE for each type of document you wish to store on each IS system.

**NOTE** Before setting up CFS-IS in non-English FileNet P8 environments, see the *Installing FileNet P8 Platform in a Non-English Environment Technical Notice*. You can find this document on the IBM support page at [www.ibm.com/software/data/support](http://www.ibm.com/software/data/support).

**Caution** Currently, CFS-IS does not support committing documents from CE to Centera, SnapLock, or other NLS-based storage solutions on IS because the NLS software requires cataloging on the IS server and CE does not transfer catalog information to the IS server. However, documents entering through IS can be stored on NLS-based devices on the IS system and then cataloged on CE as long as they are also cataloged on IS as well.

## CFS-IS Configuration Road Map

The following table lists the general steps you need to follow to configure Content Federation Services for Image Services:

Steps	Refer to...
On the IS system:	
Create a CFS-IS Administrative User	"Create a CFS-IS Administrative User" on page 18
Create a Group for CFS Record Management	"Create a Group for CFS Record Management" on page 19
Define Document Classes for CFS-IS	"Define Document Classes for CFS-IS" on page 20
Determine the IS document properties that need to be mapped to CE properties.	"Determine Document Property Mapping between IS and CE" on page 20
Map Annotations Security	"Annotation Security Mapping" on page 35
On the CE server:	
Verify Communication between CE and IS	"Communication Between CE and IS" on page 23

Steps	Refer to...
Create an Object Store	FileNet P8 Documentation > FileNet P8 Administration > Content Engine Administration > Object Stores > How to... > Create Object Store
Create a Fixed Storage Area	FileNet P8 Documentation > FileNet P8 Administration > Content Engine Administration > Content Storage > Fixed Storage Areas > How to... > Create Fixed Content Device
Map IS and CE document properties	<a href="#">"Property Mapping" on page 30</a>
Create a Marking Set	<a href="#">"Marking Set" on page 31</a>
<b>On the RAC workstation:</b>	
Configure Annotations Export	<a href="#">"Configure the Annotation Export" on page 34</a>
Map Annotations Security	<a href="#">"Annotation Security Mapping" on page 35</a>
Configure Catalog Export from IS	<a href="#">"CFS Connector - IS Catalog Export" on page 38</a>
<b>On the entire CFS-IS system</b>	
Configure Remote Caching	<a href="#">"Remote Caching" on page 42</a>
Test the CFS-IS Configuration	<a href="#">"Test the CFS-IS Configuration" on page 46</a>

## All Windows Servers (Both CE and IS)

### Verify TCP/IP Parameter Settings on Windows Servers

**NOTE** These settings are not required on UNIX servers.

In this section, you'll verify the maximum number of available temporary ports and the length of time the server waits before reusing a closed socket ID. If either of these parameters do not yet exist, this section provides steps to define the parameters.

**NOTE** These modifications have been found to be favorable for optimal performance. Unless you have set these parameters differently for other system reasons, use these parameter settings.

- The **MaxUserPort** parameter determines the number of temporary ports that can be assigned on the server. These temporary ports are assigned by a server's IP stack from a designated range of ports for this purpose. When network traffic is very busy, it is possible to run out of temporary ports unless you increase the MaxUserPort setting.
- The **TcpTimedWaitDelay** parameter determines the length of time the server waits before reusing a closed ID socket. Although the default value is typically around 240 seconds (four minutes), this parameter can safely be reduced to as little as 30 seconds on high-speed networks.

- The **TcpNumConnections** parameter limits the maximum number of connections that TCP can have open simultaneously. If this parameter is not defined, the default value of 6,777,214 (0xFFFFFE) TCP connections is used.

1. From a Command Prompt window, enter the following command to open the Registry editor:

```
REGEDT32
```

**NOTE** You can also enter the above command in the task bar Run dialog box.

2. In the HKEY\_Local\_Machine on the Local Machine window, open the **System** folder and navigate to the Tcpip Parameters folder using this path:

```
SYSTEM > CurrentControlSet > Services > Tcpip > Parameters
```

3. Locate the **MaxUserPort** parameter.

If this parameter is already set to 65534 (decimal) or FFFE (hex), skip to [Step 4](#).

If this parameter is less than 65534 (decimal) or FFFE (hex), increase the value as follows:

- a. Double-click on the entry to open the DWORD Editor dialog box.
- b. In the DWORD Editor dialog box, set the Radix to decimal or hex, and change the value to 65534 (decimal) or FFFE (hex).
- c. Click **OK**, and skip to [Step 4](#).

If this parameter does not exist, define the parameter as follow.

- a. From the Registry Editor Edit menu, select **Add Value**.
- b. Enter **MaxUserPort** in the Value Name box, and select REG\_DWORD from the Data Type box drop-down list; then click **OK**.
- c. Set the Radix to decimal or hex, enter 65534 (decimal) or FFFE (hex) in the Data box, and click **OK**.

The Registry Editor now shows the new MaxUserPort entry in hex.

4. Locate the **TcpTimedWaitDelay** parameter.

If this parameter is already set to 30 seconds (decimal) or 1E (hex), skip to [Step 5 on page 18](#).

If this parameter is more than 30 seconds (decimal) or 1E (hex), reduce the value as follows.

- a. Double-click on the entry to open the DWORD Editor dialog box.
- b. In the DWORD Editor dialog box, set the Radix to decimal or hex, and change the value to 30 (decimal) or 1E (hex).
- c. Click **OK**, and skip to [Step 5 on page 18](#).

If this parameter does not exist, you need to define it.

- a. From the Registry Editor Edit menu, select **Add Value**.
- b. Enter **TcpTimedWaitDelay** in the Value Name box, and select REG\_DWORD from the Data Type box drop-down list; then click **OK**.

- c. Set the Radix to decimal or hex, enter 30 (decimal) or 1E (hex) in the Data box, and click **OK**. The Registry Editor now shows the new TcpTimedWaitDelay entry in hex.
5. Close the Registry Editor window. The new registry values will take effect the next time you restart the server.

## Image Services System

The following subsections describe the tasks needed to prepare the IS system for CFS.

These tasks are performed by the IS system administrator.

When the tasks on the IS system are finished, the IS system administrator will need to provide the CE system administrator with the following information:

- IP address of the IS server.
- Three-part Domain Name of the IS system.
- Server Name of the IS Root/Index server.
- CFS Administrative user name.
- CFS document class(es).
  - CFS document class index properties, if configured.

## Create a CFS-IS Administrative User

Create a new user to administer CFS-IS. You can select any user name, such as CFSuser01, ISadmin, or whatever you choose.

This is the user name that CE will use to log On to IS.

**NOTE** Make the user name unique, memorable, and simple. Do not use the underscore character in the user name. Although underscore characters are normally permitted in IS user names, CE does not allow them. Conversely, CE allows the following characters: # [ ] ! < > ? \* but IS does not.

If several CE servers will be accessing separate document classes on the same IS system, create a separate user ID for each CE server.

Add this user to any other IS security groups that have access to the IS document classes to be accessed by the CE user, such as **mgmt**.

For example, you could choose to create a document class named SPECS with these group permissions:

```
Read:  mgmt
Write: engr
App/Ex: sales
```

To have full access to the documents in this document class, the new user must be a member of all three groups—mgmt, engr, and sales.

An alternative would be to make this new CFS administrative user a member of the SysAdmin group. This would allow the CFS administrative user wider access, but might be considered a higher security risk.

## Create a Group for CFS Record Management

Create a new group to provide Record Management (RM) security for CFS-IS. You can select any group name, such as CFSgrp, RMsecurity, or whatever you choose.

Add **only** the CFS-IS administrative user to this group.

**NOTE** No other IS users should be made members of the RM group.

RM provides an additional level of security for IS index data that are going to be mapped to CE document properties.

**Caution** When using a CFS-IS system with Records Manager, do not set an expiration date on documents that are stored in Image Services. There is currently no automated way for the CFS-IS administrative user on the IS system to differentiate between Records Manager documents that are placed on hold and cannot be deleted and those that can be deleted.

## Configure Record Management Security

To configure RM security, make sure you're logged onto the IS root/index server as any member of the **fnadmin** group, such as **root** (UNIX) or **SysAdmin** (Windows).

**NOTE** For a complete description of the **SEC\_rm\_config** tool, see the *Image Services System Tools Reference Manual*. You can find this document on the IBM support page at [www.ibm.com/software/data/support](http://www.ibm.com/software/data/support).

1. Launch the RM configuration utility by entering:

```
SEC_rm_config
```

**Caution** After RM security has been established, it cannot be removed.

The command line options display.

- Enter **d** at the prompt to display the current settings. The first time you run the **SEC\_rm\_config** tool, the default settings display.
- Enter **e** to edit the current settings.

The default setting for Record Level Security is **READ\_ONLY**, this highest level of security. The three levels of security are:

- **READ\_ONLY** - Any user who is not a member of the SysAdminG group and who already has at least Read privileges to the documents can only view the documents
- **APPEND\_ONLY** (includes Read permission) - Any user who is not a member of the SysAdminG group and who already has at least Read and Append/Execute privileges to the documents can only view the documents and add new annotations.
- **NO\_CHANGE** - No additional security is applied. The same security settings as currently exist in the IS index database will be in effect.

1. Enter the letter of one of the lower levels of security, or press Return to accept READ\_ONLY security.

The first time you run the **SEC\_rm\_config** tool, the Group name is undefined. Enter the name of the special purpose group you created for the CFS-IS administrative user, such as RMsec.

2. Next you can choose either minimal or verbose activity logging. The default setting is MINIMAL. You can change this setting to VERBOSE or just press Return to accept the default.
  - When you have finished editing the RM configuration parameters, enter **s** at the prompt to save your changes.
  - Enter **d** at the prompt to display the new settings.
3. To exit the RM Configuration Utility, enter **q** at the prompt.

## Define Document Classes for CFS-IS

Use Database Maintenance to create one or more new document classes for CE documents.

**NOTE** Define a new media family for new CFS documents. This is optional, but you could find it helpful for organizing your data and keeping track of the CE document classes.

**Caution** If you assign a mapped IS document class to a different media family, **you must restart all the CE Services on CE** so it will recognize the new assignment. CE gathers information about the IS system only when it's restarted.

- If the documents that will be stored in this document class are going to be captured by the CE server, be sure to set the **enable cataloging** option to **No**. No index properties need to be configured for this document class; the documents will not be retrievable from IS.
- If the documents that will be stored in this document class are going to be captured on the IS system, you have two choices:
  - If you want to be able to retrieve the documents from only the CE server, be sure to set the **enable cataloging** option to **No**. Index properties still need to be configured for this document class so they can be exported to CE; but the documents will not be retrievable from IS. If you change the **enable cataloging** option to **yes**, contact IBM Customer Support for assistance.
  - If you want to be able to retrieve the documents from **both** CE and IS, set the **enable cataloging** option to **Yes**. Index properties for this document class are then cataloged on both CE and IS.

**NOTE** Documents that are not cataloged on the IS system cannot be retrieved by IS applications.

## Determine Document Property Mapping between IS and CE

If the documents in the document classes you define on CE are also going to be cataloged on IS system, the index properties you define for the CE document classes must equate to index properties defined for the corresponding document classes on IS.

Use the following tables for each supported relational database type to help you define the index properties for your CFS system.

**Table 1: Oracle Data Types**

Image Service Data Type	Display Mask	Content Engine Data Type
Numeric	#####	Long Integer
Numeric	#####	Float
Numeric	###	Float
String	<any>	String
Date	<any>	Date
Menu*	<any>	String (as choice list)

**Table 2: DB2 Data Types**

Image Service Data Type	Display Mask	Content Engine Data Type
Numeric	#####	Float or Integer
Numeric	#####	Float
Numeric	###	Float
String	<any>	String (its length must be greater than the IS string)
Date	<any>	Date
Menu*	<any>	String (as choice list)

\* An IS menu cannot have more entries than the corresponding CE choice list.

In addition to the user-defined index properties that are defined on the IS system specifically for each document class, the following IS system properties, which are generated for all IS documents, can also be mapped to CE properties:

- F\_ARCHIVEDATE, integer(4)
- F\_DELETEDATE, integer(4)
- F\_DOCCLASSNUMBER, integer(4)
- F\_DOCFORMAT, varchar(239)
- F\_DOCLOCATION, varchar(239)
- F\_DOCNUMBER, decimal(10,0)
- F\_DOCTYPE, char(1)
- F\_ENTRYDATE, integer(4)

- F\_PAGES, integer(4)
- F\_RETENTOFFSET, integer(4)

**Caution** If you export index properties from an IS document class to a CE document class that has one or more **required** properties that have not been mapped, the CFS-IS Import Agents stop and no index properties are imported to the CE document class. Such documents will not be federated and **will not be available to the P8 user**.

There are two solutions. Either:

- Make sure **all** the CE properties that are defined as **required** have been mapped to IS index properties in the appropriate Document Class.
- or -
- Delete the unmapped CE property from the CE document class.

Then restart the CFS Service. Note that the document that failed might not be processed immediately after the CFS Service restarts – there could be a short delay.

## ***Numeric Ranges***

When mapping numeric values, be sure to consider the following limits:

### **Oracle**

Number: The numeric range for a number variable is:

1.0E-130 to 9.99E+125

### **DB2**

DOUBLE: The largest positive value is +1.79769E+308 and the largest negative value that a double can hold is "-1.79769E+308".

The smallest positive value a DOUBLE can have is +2.225E-307 and the smallest negative value is -2.225E-307.

### **SQL Server**

Float: The numeric range for a float variable is:

-1.79E+308 to 1.79E+308

## ***Mapping Numeric Data Types***

IS numeric fields can hold numbers with more digits than CE fields of data type integer or data type float, so mappings between IS numeric fields and CE fields of type integer and type float require special consideration.

For example, if an IS numeric field is mapped to a CE field of type integer, and an IS user enters a number on a specific document that is larger than the CE integer field can hold, then that specific document will not be federated and **will not be available to the P8 user**.

However, if an IS numeric field is mapped to a CE field of type float, and an IS user enters a number on a specific document that is larger than the CE type float field can hold, then that specific document will be federated, but with a loss of precision in this property.

Therefore, to prevent either of these situations, store your numeric data in a string index on IS when dealing with very large numbers or numbers with high precision. The data can then be mapped to a string property on CE, thus ensuring the numeric data is federated correctly.

## ***Multi-valued CE Properties***

CFS-IS does not currently support multi-valued CE properties.

# **Content Engine Server**

The CE system administrator needs to know the following information about the IS system:

- IP address of the IS server.
- Three-part Domain Name of the IS system.
- Server Name of the IS Root/Index server.
- ISCE user name.
- ISCE document class(es).
  - ISCE document class index properties, if configured.

## **Communication Between CE and IS**

Because CE and IS are on separate servers, the first responsibility of CFS-IS is to discover the IP (Internet Protocol) address of the IS system's Root/Index server. One component of the IS Root/Index server is the Network Clearinghouse (NCH) service. NCH is a FileNet proprietary component that keeps track of the network resources and their IP addresses. As IS can be consolidated onto a single platform, or distributed across many platforms, the NCH service knows where everything is, including the IP address of the Root/Index server.

All IS components, including CFS-IS, try to discover the NCH service in the following four ways and in this order:

1. See if the NCH service is on the current system.
2. Look in the current system local **hosts** file for an NCH service entry.
3. Use a Name Resolution Service server, which has an NCH service entry.
4. Perform a broadcast to discover the NCH service.

In CFS-IS configurations, Step 1 will never succeed because CE is always on a separate platform from IS. Step 2 and Step 3 requires proper configuration. Also, if the Name Resolution Service resolution in Step 3 is not successful, and if broadcasts are enabled, the system will go to Step 4 and try broadcasts to resolve the NCH service name to an IP address. But broadcasts are frequently disabled at sites due to system bandwidth concerns.

Additionally, broadcasts only work if the systems are on the same IP segment. As a result, Step 4 is frequently not an option.

This leaves two ways the CE server can locate the address of the IS system:

- Name resolution through the local **hosts** file as in Step 2.

This method is straightforward because it doesn't require privileges on a domain name system, but the system administrator needs to make sure the **hosts** files on ALL CE servers are updated.

- Name resolution through a Name Resolution Service as in Step 3.

This method is easier because the domain name and the IP address of the IS system need to be updated in only one place, but it requires privileges on a centralized Name Resolution Service system.

## *IS Domain Names versus Server Names*

Whether the CE server uses a Name Resolution Service or the **hosts** file, it is important to refer to the IS system appropriately.

The system administrator of the IS system has already defined the three-part IS name when the IS software was installed and configured. The three-part name is constructed like this:

<IS\_name>:<IS\_domain\_name>:<IS\_organization>

In most cases <IS\_name> is DefaultIMS, and <IS\_organization> is your company name. The <IS\_domain\_name> is the name of the entire IS domain.

For example:

DefaultIMS:Senna:YourCo

**Caution** Often the <IS\_domain\_name> is the same as the server name of the IS Root/Index server. But this is not always true. In the example above, the IS domain name could be **senna** while the IS Root/Index server name might be **ayrton**. The system administrator of the IS system knows if these two names are different.

The **server name** is defined when the operating system is initially configured, while the **IS domain name** is configured during the IS system configuration.

## *Creating a Four-Part NCH Service Name*

Construct a four-part NCH service name by making the following changes to the IS domain:organization name:

- Convert all characters to lower case.
- Eliminate all characters except for ASCII alphanumeric characters and hyphens.
- Insert a hyphen between the domain and organization names.
- Append "-nch-server" to the end of the string.

For example:

IS Domain name: **AccountsPayable:YourCo**

NCH Service name: **accountspayable-yourco-nch-server**

## Modifying the Hosts File

The **hosts** file must contain the four-part NCH service name for each IS domain that will participate in CFS-IS. Each CE server's **hosts** file must include this entry.

**NOTE** The location of the **hosts** file depends on where the Windows software is installed.

The general format of a **hosts** file entry is:

```
<IP_address_of_IS_Domain> <IS_server> <NCH_four_part_service_name>
```

For example:

IS Root/Index server IP address: **10.14.80.97**

IS Root/Index server name: **senna**

IS Domain name: **AccountsPayable:Yourco**

The **hosts** file entry looks like this:

```
10.14.80.97 senna accountspayable-yourco-nch-server
```

**Caution** If you have separate CE servers for Object Store Services (OSS) and File Storage Services (FSS), be sure to make the same entry in the **hosts** file on each CE server.

## Using a Name Resolution Service Server

If a Name Resolution Service (such as Domain Name Service [DNS], Network Information Service [NIS], and so on) is configured, an alias entry for the IS Root/Index server must include the four-part NCH service name.

For example,

IS Domain name: **AccountsPayable:YourCo**

IS Root/Index server name: **senna**

Add an alias to the entry for server senna:

```
Alias name= accountspayable-yourco-nch-server
```

## Communicating Through a Firewall

IS uses the following port assignments to enable network communication through firewalls. On UNIX platforms, these port assignments are made in the `/etc/services` file.

```
tms      32768/tcp
cor      32769/tcp
nch      32770/udp
```

- The **tms** port is used by `TM_daemon`, which runs on IS servers, to get the status of other IS servers in the same IS domain. It is not used on CE.

- The **cor** port is essential on both IS and CE for remote procedure calls (RPCs) to work.
- The **nch** port is only necessary if the client is locating the Image Services NCH host by broadcasting. Many system administrators prefer not to use the UDP protocol and block it.

## Verify the Connection Between CE and IS

When a CFS application wants to communicate with an IS system, it must first locate the correct server. You can test the connection between the CE server and the IS server with the nslookup and ping tools, which are described in the CFS help.

## Launch Enterprise Manager

To begin the configuration of CFS-IS on the CE server, you need to launch the Enterprise Manager (EM).

1. Launch EM on a Windows workstation. Select Start > Programs > FileNet P8 Platform > Enterprise Manager SnapIn.
2. At the logon screen, enter the appropriate user name and password. When you click **OK**, the EM screen displays.

## Create an Object Store

Be sure to create an object store before you configure a fixed file storage area for CFS-IS. If the object store already exists, you can skip to the next section, [“Create a Fixed Content Device in EM” on page 27](#). For information on creating an object store, see Help on FileNet P8 Documentation > FileNet P8 Administration > Content Engine Administration > Object Stores > How to... > Create Object Store.

**Caution** If you create the object store **after** you have created the IS-based file storage area, a problem could occur when you create the object store and override the IS document class to be something other than the default for the IS Fixed Device.

Note that this will not cause a problem if the IS based file storage area is created for an **existing** object store; it only occurs during creation of a new object store, and only if the IS document class is overridden.

The result is that non-federated content created in the file storage area is sent to the document class of the Fixed Device, and not to the document class selected to override that value during object store creation.

To work around the problem, use EM to alter the file storage area.

- On the Fixed tab of the file storage area, change the IS document class listed at the bottom of the dialog to some other class and press **Apply**.
- Then change the IS document class back to the desired value and press **Apply** again.

At this point the data is fixed, but is still cached. Restart all File Storage Services to fully apply the fix.

## Create a Fixed Content Device in EM

For information on creating a Fixed Content Device, see Help in FileNet P8 Documentation > FileNet P8 Administration > Content Engine Administration > Content Storage > Fixed Storage Areas > How to... > Create Fixed Content Device.

### Vendor and Configuration Parameters

When this screen displays, make sure **Image Services** is selected from the pulldown Type list. The Vendor is **FileNet**.

In the Configuration Parameters area, enter the following information:

- **IS Domain:** The domain name was assigned when the IS system was first installed. (For example, if the three-part domain name were DefaultIMS:senna:yourco, you would enter senna.)
- **IS Organization:** This should be your company name, such as yourco, bigcorp, and so on.
- **User Name:** The name of the ISCE user that was created earlier on the IS system. This user must already exist on the IS server.
- **Password:** Enter the password for this ISCE User.
- **Confirm Password:** Retype the same password.
- **Cancel Open Seconds:** The default is 60 seconds.

Click the **Test Connection...** button to make sure the CE server can locate and log on successfully to the IS server. A popup window displays the message:

Connection successful

If you do not see this message, use the connection tools described in [“Tools” on page 47](#) to troubleshoot the connection.

### Default IS Document Class

**NOTE** The document class you're going to select must already exist on the IS system; otherwise, it won't appear on the list of available document classes.

On the Default IS Document Class screen, select a default document class from the pulldown list. Notice that **every** document class on the IS system is listed. Select the document class that you specifically created for CFS-IS.

### CFS Server for Image Services

On the CFS Server for Image Services screen, parameters can be left at their default settings, or you can adjust them to suit your business processing needs.

### Complete the Create a Fixed Content Device Wizard

On the Complete the Create a Fixed Content Device screen, verify that all the information you entered is correct.

## Editing a Fixed Content Device

### *Domain Root Properties*

Right-click the fixed content device you want to modify, and select Properties from the context list.

### *Properties: General*

You can edit any of the fields that are not grayed out. Click **Help** for more information about modifying these attributes.

### *Properties: Site Settings*

The Site Settings tab allows you to view and edit site-specific settings. Use this tab to configure the CSM cache name for Image Services.

- **Site:** The site name.
- **CSM cache name:** The three part name of the Image Services CSM cache that is nearer to the site than the default cache.
- **Add:** Click this button to open the Site Setting dialog box to configure a new site setting for this fixed content device.
- **Edit:** Click this button to open the Site Setting dialog box to change a site setting that has already been configured. This button is disabled if no site setting is selected.
- **Delete:** Click this button to delete the currently selected site setting. A confirmation dialog box displays to ensure you want to delete the selected item.

## Creating a Fixed Storage Area

The CE system administrator is responsible for creating the Fixed File Storage area.

**NOTE** For more information on creating a fixed storage area, see Help on Enterprise Manager Administration tool > Content Storage > File Storage Areas > How to... > Create Storage Area.

1. In the left pane of EM, expand Object Stores, open the object store you created earlier, and right-click Storage Areas.
2. On the popup menu, choose **New Storage Area**. The Create a Storage Area Wizard begins.

### *Specify a Site*

Select the appropriate site from those displayed.

### *Name and Describe the Storage Area*

Follow the instructions on the screen to enter a unique file storage area name, such as senna\_docs.

The name you enter also displays in the Description field. You can type additional description comments, if you choose.

## ***Specify the Storage Area Type***

Click the Fixed File Storage radio button.

### ***Fixed Storage Area***

In the Fixed Content Device field, select the appropriate device, such as sun04\_FCD, from the drop down list.

Make sure the folder in the Staging Area Path field has already been created.

The default IS document class for this Fixed Content Device displays In the Fixed Content Device default field. To change this, click the Selected below radio button and choose a different IS document class from the drop down list.

### ***Select the Size Parameters of the Storage Area***

In the Storage Area Size panel, type the Maximum Size and Maximum Number of Elements.

In the Delete Method field, the default is Standard. You can select a different delete method from the drop down list, if you choose.

### ***Specify Storage Policy***

Click the appropriate radio button to:

- **Create Storage Policy** - Select this option to create a new storage policy specifically for this storage area. You can name the new storage policy anything you choose.
- **Map storage area to existing Storage Policies** - Select this option to use any of several existing storage policies.
- **Do not create a new storage policy** - Select this option if you do not want to create a new storage policy at this time.

**NOTE** As stated on this screen, the storage area will NOT be used until it is mapped to a storage policy.

### ***Complete the Create a Storage Area Wizard***

On the Completing the Create a Storage Area Wizard screen, verify that all the information you entered is correct.

## Content Engine Service Shutdown Sequence

The following shutdown sequence is necessary due to internal retry logic from the CFS-IS Import Agents.

1. Shutdown the Content Federation Services for Image Services.
2. Shutdown WebLogic or WebSphere®.

## Property Mapping

**NOTE** You only need to map document classes if the documents originate on the IS system. There is no need to map document classes in which the documents originate on the CE server.

1. In the left pane of the EM window, expand the **Document Class** folder and locate the document class you're going to map to the IS document class.
2. Right-click the document class name and right-click Properties.
3. On the Properties window, select the Content Federation tab.

## Image Services

On the Content Federation tab, you can map additional IS document classes and edit existing document class mappings.

Click the **Add/Edit...** button. The Add/Edit External Class Mapping screen displays.

## Add/Edit External Class Mapping

Each IS document class can be mapped to one or more CE document classes. You can map a single IS document class to one or more CE document classes as long as each CE document class is in a different object store. However, only one CE document class can be the default for high volume capture and post-committal indexing.

On the Add/Edit External Class Mapping screen, select the IS fixed content device you want to map to from the pulldown menu in the External Repository pane.

**NOTE** Every document class defined on the IS system displays in the pane below.

In the Content Engine pane, select the appropriate CE document class. When you click the **Add** button, the new mapping displays in the Current Class Mappings pane at the bottom of the window.

To remove a class mapping, select the mapping in the Current Class Mappings pane and click **Remove**.

To map the index properties between the two document classes, click the Map Properties... button.

## Add/Edit External Property Mapping

On the Add/Edit External Property Mapping screen, you can see the currently defined index property mappings for the IS-CE document class, if any.

To create a new mapping, select one property in the External Repository pane and one property in the Content Engine pane and click **Add**. The new mapping is displayed in the Current Property Mappings pane at the bottom of the window.

**NOTE** Refer to the tables in the section, [“Determine Document Property Mapping between IS and CE” on page 20](#) for mapping recommendations.

To remove a property mapping, select the mapping in the Current Property Mappings pane and click **Remove**.

Click **OK** to continue.

After you finish mapping properties, restart CFS-IS by going to the Services Console, locating the “FileNet CFS Service,” and restarting this service.

Repeat the steps in this section for each Image Services system you want to include in the Content Federation Services for IS environment.

## Marking Set

To prevent FileNet P8 Platform applications from updating catalog properties of documents in document classes whose properties are being exported from IS to CE, create a temporary FileNet P8 marking set for the CE document class.

**NOTE** For more information on creating a marking set, see [Help for FileNet P8 Documentation > FileNet P8 Administration > Content Engine Administration > Content Engine Wizard Help > Create Marking Set](#).

Markings and marking sets are CE objects, each with a class description:

- Markings are objects that combine metadata behavior with access control behavior in a way that allows an object's access control to change by changing a property value.
- Marking sets are containers for markings and are associated with a Property Template that can then be used to add a property to one or more classes.

Markings enable you to control access to objects based on specific property values. When a marking is applied to an object, the resulting access permissions for the object are a combination of the settings of its original access permissions and the settings of the marking's Constraint Mask for each marking that is applied to it. The result of this combination is the effective security mask.

For CFS-IS, you can define a character string property with a specific value and add this property to each CE document class whose other properties are being imported from IS.

This character string property does not need to be mapped to any IS property. This property acts as an anchor for a marking set that will prevent any updates to the CE document class that might conflict with the IS document class.

After all the IS properties have been imported to CE and the mapping to the IS document class is no longer needed, you can remove this string property from the CE document class. When this property has been removed from all CE document classes, you can delete the marking set.

**Caution** While this temporary marking set is in place, Records Manager (RM) cannot declare any documents in the document class as records. (To declare a document as a record, RM needs to update certain ownership and security properties.) When the marking set has been removed, RM can then successfully declare the documents as records.

For more information on markings and marking sets in general, see the FileNet P8 Enterprise-wide Administration help for Security.

## Create a Marking Set

1. In the **Enterprise Manager** tree, right-click Marking Sets and select **New Marking Set** to launch the Create a Marking Set Wizard.

On the **Welcome** screen, click **Next** to continue.

2. On the **Select the Markings Set Type** screen, keep the default setting and click **Next** to continue.
3. On the **Add Markings** screen, enter a name for this marking set. You can choose any name you wish.
4. On the **Create New Marking** screen, enter a Marking Value name, such as NoUp, in the Marking Value field. You can choose any value you wish, but the value needs to match the value of the property that will be added to the document class. Choose a value that is as concise as possible.
5. Click the **Constraint Mask** tab. On the **Constraint Mask** tab, click the **Deselect All** button to remove the check marks from all the boxes. The only two boxes you need to check are **Modify all properties** and **Create instance**. All the other boxes should be empty.
6. Next click the **Security** tab.

On the **Security** tab, click the **Add** button. From the list of users and groups, select the #AUTHENTICATED-USERS group.

- In the **Type** area, click the Allow radio button.
- In the **Level** area, click Custom.
- In the **Rights** area, remove the check marks from all three boxes.

Click the **Add** button again.

7. From the list of users and groups, select the Administrator user.
  - In the **Type** area, click the Allow button.
  - In the **Level** area, click Custom.
  - In the **Rights** area, remove the check mark from only the Use Marked Objects box.

Now click the **OK** button.

8. You return to the **Add Markings** screen where the marking value displays. There are no other markings to add to this marking set, so finish the Wizard.

Now you need to create the property that will anchor the marking set in the document class.

## Create a Property Template

1. In the **Enterprise Manager** tree, expand the **Object Stores** node.
2. Expand the appropriate object store in the left pane.
3. Right-click **Create Property Templates** and select **New Property Template**.  
Enter a name for the new property template in the Name field.
4. On the **Select the Data Type** screen, select **String**.  
Marking sets can only be linked to string data types, so select **String** and click **Next** to continue.
5. On the **Select a Choice List** screen, click **Assign marking set**, and from the drop down list, select the marking set you created in the previous section.  
Click **Next** to continue.
6. On the **Single or Multi-Value** screen, click **Single**, and then click **More** to set the property's default value.  
Since this property is not going to be mapped to an Image Services document class, this property needs to have a **Default Value**.  
Enter the Marking Value you previously created in **Default Value**. Note that the default value is case sensitive.
7. Set the **Maximum String Length** to the number of characters in the marking value you created. If the marking value is NoUp, as in the example, set the Maximum String Length to 4.  
**NOTE** The value is always required, so make sure the **Value Required** box is also checked. (Leave all the other selections at their default values.) Then click **OK** to continue.
8. Finish the Wizard.

So far, you have created the marking set and the property template. All that remains is to add the property to the document class.

## Add the Property to a Document Class

1. Locate the Document Class that is mapped to IS.
2. Right-click on a class and select **Add Properties to a Class**.
3. On the **Select Properties** screen, locate the CFSNoUpdate property you just defined. Click **Add** to add it to the document class.
4. Finish the Wizard.

Now that the property is included in the document class, the marking set will prevent any updates that would not be propagated to the Image Services document class.

## Annotations

Beginning with the IS 4.0 SP5 / P8 4.0 releases, IS annotations can be copied to CE automatically when the IS catalog data is exported.

Annotations created on the CE system remain on the CE system. They cannot be copied to the Image Services system and are not viewable by the Image Services system.

Annotations created on the IS system are automatically copied to the CE system.

- When the document properties are exported from IS to CE, any associated annotations are automatically copied to the CE system.
- Any annotations that are added on the IS system later are automatically copied to the CE system.
- Annotations to documents whose properties were exported to CE prior to P8 4.0 can be copied to the CE system separately.

**NOTE** When viewing annotations in P8 Workplace, the entire annotation might not be visible. Right-click the annotation and expand the border.

If Workplace won't let you right-click or if right-clicking doesn't work, another solution is to change the 'filenetAlwaysRubberband' option in <WorkplaceInstallDirectory>\UI-INF\jsp\ui\WcmJavaViewer.jsp to FALSE. The next time you log onto Workplace, the full annotation should be visible.

## Configure the Annotation Export

The automatic transfer of annotations from IS to CE is supported in IS 4.0 SP5 and higher, and CE 4.0 and higher. When both IS and CE systems have been updated to this level, the IS System Administrator can activate annotation export using the IS System Configuration Edition, **fn\_edit**.

1. As a user with **root** privileges, launch **fn\_edit** on the IS Root/Index server.
2. Select the System Appl. Services tab.
3. Select the Others sub-tab.
4. Scroll to the extreme right and click the Export Annotations box so it's check-marked **Yes**.
5. Exit from **fn\_edit** and save the change.
6. Restart IS to rebuild the system configuration files and put the change into effect.

Annotations can now be copied directly from IS to CE.

**NOTE** The original IS annotation always remains in the IS system.

## Exporting Annotations

After the Export Annotations option has been set in **fn\_edit**, annotations are automatically copied to the CE system whenever the associated document properties are exported from IS or when annotations to an already mapped IS document class are added or modified. IS annotations can also be copied separately if the catalog data has already been exported to CE, as described in the previous chapter.

The annotations being exported are copied to the `annot_log` table in the MKF permanent database on the IS document locator server. (In an IS system, the document locator server is a storage library server that includes the complete MKF permanent database.)

Annotation Import Agents on the CE server monitor the `annot_log` file on the IS system and retrieve any annotations they find.

### Note

IS annotation content is stored on IS in binary format; on CE the annotation content is stored in XML format.

On CE, annotations are usually stored in a class named `Annotation`. The Import Agents store the annotations from IS in a sub-class of the `Annotation` class called `ISAnnotation`.

## Annotation Security Mapping

Security mapping for IS annotations is managed on the IS system.

- Without security mapping, the access permissions (read,write,append/execute) for annotations exported to CE are `ANYONE/ANYONE/ANYONE` regardless of the actual annotation security.

**NOTE** The IS group `ANYONE` corresponds to the CE group `#AUTHENTICATED-USERS`.

- With security mapping, the same access permissions in effect on an IS annotation will carry over to the CE server.

Activating annotation security mapping is a two step process:

1. Use the **SEC\_map** tool on the Image Services server to map the IS users and groups to CE distinguished names. The mapping is stored in the MKF Security database on the IS server.
2. Use the Application Executive (**Xapex**) Security Administration (**Xsec\_admin**) to turn off the CFS-IS No Annotation Security Mapping option.

These two processes are described in the following sections.

**NOTE** Security mapping takes place when the annotations are federated; that is, when they're copied from IS to CE. Turning on Annotation Security does not affect any annotations that have already been federated. Those annotations must be re-copied from IS for Annotation Security to take effect.

## Mapping User and Group Security for Annotations

After you have created the document class mapping in EM on CE, you can use the **SEC\_map** tool on the IS system to map the user and group security for annotations.

1. Launch the SEC\_map tool from a command prompt:

```
SEC_map
```

2. Export the users and groups:

```
SEC_map> export_all
```

3. Answer the prompts to log on, select the LDAP type, and select a suffix for the distinguished name.

SEC\_map reads the MKF security database and creates the user.txt and group.txt files in the current directory. The IS user and group names are converted to CE distinguished names based on your answers to the previous prompts.

4. When the export is finished, exit from SEC\_map.
5. Now use your preferred text editor, such as **vi**, to view these two files and make sure all the IS users and groups are mapped correctly to the appropriate CE distinguished names. Make any changes as needed, and save the files.

**NOTE** If necessary, you can delete the two files, and run **export\_all** again.

6. When you are sure the user.txt and the group.txt are correct, launch SEC\_map again and import them into the MKF security database:

```
SEC_map> import
```

7. Follow the prompts to import the user.txt file, then the group.txt file. SEC\_map validates each distinguished name before storing it in the MKF Security database on the IS Root server.

After an entry is stored in the MKF security database, the corresponding entry is deleted from the user.txt or group.txt file. If an entry cannot be validated, it is not removed from the file.

If all the distinguished names are valid and the user.txt and group.txt files are empty, SEC\_map deletes them. If any invalid entries remain, you can exit from SEC\_map, re-edit the files, and re-run the import.

**NOTE** For more information about SEC\_map, see the *Image Services System Tools Reference Manual*. You can find this document on the IBM support page at [www.ibm.com/software/data/support](http://www.ibm.com/software/data/support).

## Activating CFS-IS Annotation Security Mapping

After the IS user and group names have been mapped to CE distinguished names with the SEC\_map tool, the IS System Administrator can activate annotation security mapping using the IS Application Executive, **Xapex**.

1. Start Xapex by double-clicking the icon in the FileNet Image Services Server Application program group or by entering **Xapex** at the command prompt.
2. Choose Security Administration from the Application Executive's Applications menu.

3. Select Default Security Settings from the System menu to display the Update Default Security Settings dialog box.
4. To activate annotation security mapping, remove the check mark from the box next to CFS-IS No Annotation Security Mapping.
5. Click **OK** to accept your changes and close the dialog box.
6. The change will go into effect the next time you restart IS.

The following table illustrates how IS access permissions correspond to CE access permissions:

IS Read Access	IS Write Access	IS Append/Execute Access	IS Capabilities	CE Access Rights
✓	—	—	<ul style="list-style-type: none"> <li>• View</li> </ul>	<ul style="list-style-type: none"> <li>• View all properties</li> <li>• View content</li> <li>• Read permissions</li> </ul>
✓	✓	—	<ul style="list-style-type: none"> <li>• View</li> <li>• Modify</li> </ul>	<ul style="list-style-type: none"> <li>• View all properties</li> <li>• View content</li> <li>• Read permissions</li> <li>• Modify all properties</li> <li>• Modify permissions</li> </ul>
✓	✓	✓	<ul style="list-style-type: none"> <li>• View</li> <li>• Modify</li> <li>• Delete</li> </ul>	<ul style="list-style-type: none"> <li>• View all properties</li> <li>• View content</li> <li>• Read permissions</li> <li>• Modify all properties</li> <li>• Modify permissions</li> <li>• Delete</li> </ul>

## IS Users with Special Privileges

The following IS users have special privileges to view the annotation content, and to view and update annotation permissions. When security mapping is turned on, these privileges are also propagated to the CE server along with the annotation security.

- The IS user whose ID is **SEC\_SYSADMIN\_USR\_ID**. This is typically the SysAdmin user.
- Any IS user whose primary group ID is **SEC\_SYSADMIN\_GRP\_ID**. This is typically the SysAdminG group.
- Any IS users whose extended membership list includes **SEC\_SYSADMIN\_GRP\_ID**

## Supported Actions on Annotations

Depending on which system an action occurs, the results are slightly different. The following tables summarize the effects of actions initiated from either system:

	Initiated from IS
<b>Insert</b>	Federate new IS annotations to CE Content stored on both IS and CE
<b>Export</b>	Federate legacy IS annotation to CE Content stored on both IS and CE
<b>Update</b>	Update CFS-IS annotation content and permissions on CE Content updated on both IS and CE
<b>Delete</b>	Delete CFS-IS annotation content. Content deleted from both IS and CE.

	Initiated from CE
<b>Create</b>	Create new P8 annotations (not CFS-IS annotations) Content stored on CE only
<b>Update</b>	Update P8 annotations Content updated on CE only Not allowed to update CFS-IS annotations
<b>Delete</b>	Delete P8 annotations Content deleted on CE only. Not allowed to delete CFS-IS annotations.

## CFS Connector - IS Catalog Export

### Maximum DIR Size

The index properties exported from IS to CE are sent in the form of a Document Index Record (DIR). Each DIR contains the index properties for a single document. The maximum supported DIR data size is 1988 bytes, which represents the sum of all index data plus four bytes overhead for each index column. The DIR limit does not apply to the actual table size, but rather to the data stored in the columns. For instance, a string index can be defined as 239 bytes in size (varchar 239, for example), but it might never actually hold more than 10 bytes. This index would be counted as 14, including the four byte overhead.

The Database Administrator can examine the layout of DOCTABA and determine the sizes based on the data stored in the index columns.

## Catalog Export for Newly Captured IS Documents

The index properties for newly captured IS documents can automatically be exported to the CE system.

### *Configure a Document Class for Export*

1. At a Remote Admin Console (RAC) workstation, select Start > Programs > FileNet > IS Remote Admin Console.
2. Enter the appropriate IS User ID and Password.
3. On the main **Remote Admin Console** screen, select **IS Catalog Export Tool** from the Applications pulldown menu.
4. From the **CE Configured IS Doc Classes** pulldown menu, select the IS document class whose index properties you want to export to CE.
5. From the **Available CE Object Store Mappings** pane, select the CE domain and object store you want to export to.

The **Default Mappings** between IS document classes and CE domains and object stores appear in the lower pane.

6. Click **OK** to continue.

## Catalog Export for Existing Documents and Annotations

Existing documents, images, annotations, and other content that are already cataloged on the IS system can also be cataloged on a CE server.

Using the RAC, you can export catalog information and annotations for existing IS documents to CE.

### *Federation of active and closed documents*

The IS Catalog Export Tool always exports the catalog information and annotations for active documents, but it does not do so for documents whose retention is considered closed. If you want to federate only active documents, skip to [“Configure a Document Class for Export” on page 39](#).

To export the catalog information for closed documents, as well as active documents, follow these steps to create a trigger file:

1. As the FileNet software user, such as **fns**, stop the IS software.

2. Create an empty trigger file. The presence of this file will alert the Catalog Export tool to export the index properties of both active and closed documents.

On UNIX servers, use the **touch** command to create the following file:

```
/fnsw/local/trigger/INX_ce_export_all
```

On Windows servers, use Notepad to create the following file:

```
\\fnsw_loc\trigger\INX_ce_export_all
```

The file does not need to contain any data.

3. Start the IS software.
4. View the event log file (elog) to verify that INX\_ce\_export\_all has been enabled.
5. Run the Catalog Export Tool as described in the next section.

If you have already exported the catalog information for a document class that contains some closed documents, run the Catalog Export tool again for that document class, but do not select the Re-Export option. The Catalog Export tool will skip the active documents that have already been federated and federate only the closed documents.

Use the IS Catalog Export Tool, run from the Remote Admin Console (RAC), to export existing document properties from Image Services to the Content Engine.

When you use the export document properties from an existing document class to a demonstration system for testing purposes, do not check the box to delete properties from the Image Services catalog database. If you do, there will be no document properties to export when you want to re-export them to your production system later.

If you export the same document properties a second or third time, be sure to select the **Re-export** option. Otherwise, the catalog entry will be ignored.

If you re-export the same catalog entries to more than one Content Engine object store, only the mapped CE properties in the most recent object store are updated when an IS catalog entry is updated.

**Caution DO NOT** check the **Delete After Export** box unless you're absolutely sure you want to remove the catalog entries from the IS catalog database.

The documents associated with the deleted catalog data will no longer be retrievable by Image Services applications. Although a locator record still exists in the permanent database, the document property information is permanently deleted from the catalog database.

When you initially configure your Content Federation Services environment to export document properties from Image Services, test the export with a small number of catalog entries before you export an entire document class. After you determine the document properties you want to export, try exporting several small groups of catalog entries to measure the timing. You can fine tune the options in Enterprise Manager on the Content Engine to adjust the No Work Delay, Batch Delay, and Documents per Batch.

## Configure a Document Class for Export

1. At a RAC workstation, select Start > Programs > FileNet > IS Remote Admin Console.
2. Enter the appropriate Image Services User ID and Password.
3. Select **IS Catalog Export Tool** from the Applications pulldown menu.
4. Click the **Catalog Export** tab.
5. Select the document class whose index data and annotations you want to export.
6. Then select the CE domain and CE object store you want to export the index data to.
7. Specify the range of documents you want to export.

- **Delete After Export:** Check this box to remove index data from the index database on the IS server after it has been exported to the CE server.

**CAUTION DO NOT** check this box for documents stored on EMC Centera, NetApp Snaplock, IBM DR550, and so on. These NLS-based devices require entries in the Image Services index database.

The documents associated with the deleted index data will no longer be retrievable by Image Services. Although a locator record still exists in the permanent database, the index information is permanently deleted from the index database.

- **Re-export:** Check this box to export index data that has already been exported, for instance, to a development system.
  - **Annotations Only:** Check this box if you want to export only the annotations associated with documents in this class. This option is useful if you've already exported the document properties to CE in an earlier release.
8. Click the **Add** button. The parameters you've just selected display in the Export List pane.  
To remove a row from the Export List, select the row and click **Delete**.
  9. Click **Export Now** to export the index information and annotations immediately. Clicking this button launches the catalog export process on the IS server and a status box displays to indicate that the process was either successfully started or encountered an error

**NOTE** When you export index data, the content always remains in the IS system. All associated annotations are copied to the CE server in their entirety, so the annotations always reside on both systems.

10. Click **Save** to write the configuration list to the export file on the IS Index server without exporting.
11. Click **OK**.

## Export Log

The parameters you specify in the Export List are stored in the Export Log on the IS server.

Meanwhile, the IS import agents on the CE server are constantly monitoring the Export Log to see if there's catalog information they need to import.

## Exporting Report Manager Document Properties

If your IS system contains FileNet Report Manager documents, the index properties for these documents are not exported to CE unless you specifically want them to be.

To export the index properties for Report Manager documents, you need to create a system environment variable on the IS Root/Index server:

```
INX_RM_FILTER_OFF
```

Only the presence or absence of this variable is checked—its value is not checked.

- If this variable is present, Report Manager document properties are exported along with other Image Services document properties.
- If this variable is not present, Report Manager document properties are not exported to CE.

In the future, if you decide you do not want to continue exporting Report Manager document properties to CE, simply delete this environment variable.

## COLD Document Support

When exporting catalog entries of COLD documents, also export the catalog entries of their associated templates to the Content Engine system so the viewer can display the documents correctly.

**Caution** When you export the catalog entries for COLD templates, DO NOT delete them from the IS index database. Future COLD documents, even though they are cataloged on CE, need to reference the template information in the IS index database.

## Remote Caching

Many businesses have a main office where most of their business is conducted and satellite offices spread around the world. A company might have its home office in, say, Chicago, and satellite offices in Seattle, Los Angeles, Houston, Atlanta, and New York. A FileNet CFS-IS system in Chicago can be configured to communicate across a Wide Area Network (WAN) with CE servers in any of the satellite locations.

To maximize CFS performance when a CFS system and satellite CE servers communicate across a WAN, CFS incorporates a remote caching capability that is both efficient and robust. Consider the following scenarios:

### Scenario 1 – Remote caching

The IS system is remote from the CE server, and an IS cache is collocated on a CE server or is configured on the same local network.

The IS CSM cache and CE can be installed on the same server or separate servers that are located at the same physical site. This configuration has been well tested and is the preferred configuration whenever the IS system is located in a physically remote site. There are significant savings in avoiding round trips across the WAN for repeated queries.

## Scenario 2 – Local caching

When the IS system and the CE server are on the same local area network, collocating an IS cache on the CE server does not have the same advantage that it does with remote caching.

If the IS CSM cache is configured either on a separate server from the CE or collocated with one of the CE servers, the savings would only apply to the particular CE server collocated with the IS CSM cache. Other CE servers in the cluster would need to access the CSM cache on that separate server, and so would not reap the same benefit as the collocated CE server.

## Performance issues for remote caching

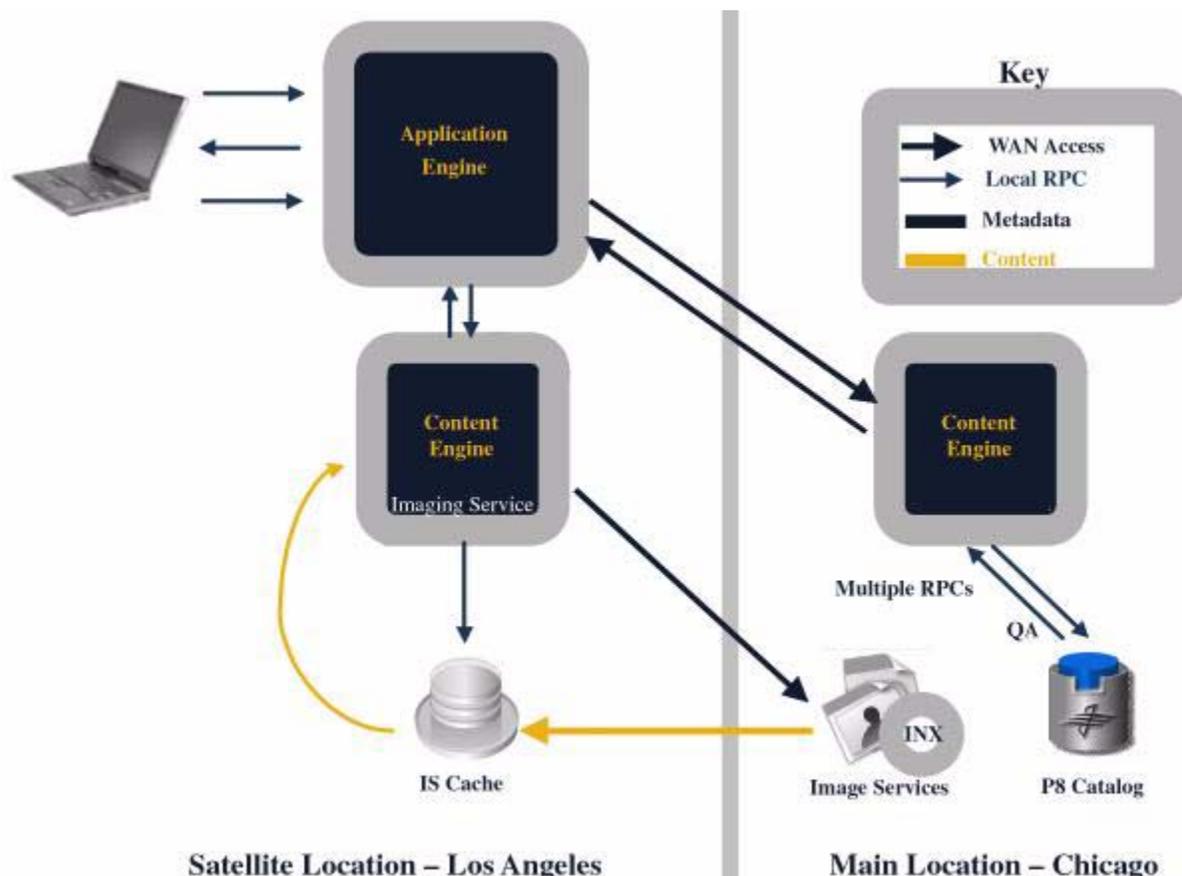
There are two performance issues when sending data over a WAN:

- Increased time delays. A large number of data requests and retrievals over a long distance can add up to a noticeable time lag.

The CFS solution is to send only one Remote Procedure Call (RPC) over the WAN per operation. Any bursts of RPC's are done over the Local Area Network (LAN).

- Decreased bandwidth. The rate of data transmission over a WAN is less than that over a LAN.

The CFS-IS solution sends large data objects over the WAN only once, on the first read access, and caches them locally on the satellite CE server. For remote entry, if the cache is local, there is no network delay when retrieving an object that has just been committed.



## Configuration on a CFS-IS system

For the local Image Services Cache Service Manager (CSM) caches on the Content Engine Server:

- CE software is installed as usual.
- IS software is installed as usual and is configured as an Application server to the main Image Services system.

**Caution** When you install the IS software on the CE server, be sure to configure the Application Server in the same NCH domain as the main IS Root/Index server. Although the CE software and the IS software can be installed on the same server, they are configured in two different kinds of domains—an IS domain, and a CE domain.

## Configuration on a satellite CFS-IS system

### *Application Engine Configuration*

When you installed the Application Engine (AE) software, the installer's "Content Engine Java™ API configuration" panel prompted you for these three URLs to use for sending and receiving data to and from the CFS system:

```
RemoteServerUrl  
RemoteServerUploadUrl  
RemoteServerDownloadUrl
```

These three values have a text box next to them containing the following default paths:

```
RemoteServerUrl  
= http://ceserver.example.com:8008/ApplicationEngine/xcmisasoap.dll  
RemoteServerUploadUrl  
= http://ceserver.example.com:8008/ApplicationEngine/doccontent.dll  
RemoteServerDownloadUrl  
= http://ceserver.example.com:8008/ApplicationEngine/doccontent.dll
```

At each prompt, change **ceserver.example.com** to the name of the Content Engine you wish to use.

For example, you set RemoteServerUrl to the address of the CE server in the main CFS system, and set RemoteServerUploadUrl and RemoteServerDownloadUrl to the address of the CE server in the local (satellite) FileNet P8 system where the IS CSM cache is located.

The three values were automatically updated in the WcmAPIConfig.properties file later during the installation procedure.

### *Content Engine configuration*

For the local CSM caches, the IS server software (which includes CSM) is installed the usual way; the CE software is installed as usual; CFS-IS is installed as usual.

## Create a CSM cache (recommended)

**NOTE** CSM can support larger caches than CE file cache, which improves system performance. In addition, CE file cache is not a write cache, so you could experience a delay if you attempt to read a document shortly after committing it. CSM cache is both a read and write cache, so there is no delay when reading a document right after it has been committed. CSM cache is optimized for best performance with IS content.

If you do not create a CSM cache local to the CE server, the system needs to get the data across the WAN. uses the standard CE file-based cache instead.

1. Install the base IS software on the CE server, or on another server in the satellite system, and follow the instructions in the *Image Services Installation and Configuration Procedures* for the appropriate CE platform to configure a cache-only IS Application server. Add the new Application server to the same IS domain as the remote IS system.

**NOTE** You cannot install Process Engine (PE) software on the same server as the remote IS Application server with Cache services.

If the CE server is linked to several remote IS systems, you need to configure several physical IS Application servers, each assigned to the appropriate IS domain. (Only one instance of Image Services can be configured on a single server.) Because they are all on the same local network as the CE server, each IS Application server will be able to provide CE with CSM services for its own IS domain.

2. Install IS on the Application server(s) you configured by following the instructions in the `sp_is_readme.htm` file on the IS software CD.

## Local CSM caches

One additional step is necessary for CFS-IS to make the satellite CE system aware of the local CSM caches, if any.

When there is one or more local IS CSM cache on the CE server, you need to create a plain text file that contains the NCH three-part names of the local CSM caches, one name per line. This text file is located on the local (satellite) CE server.

Use your preferred text editor to create a text file called **local\_CSM\_caches.txt** in the CFS-IS **fnsw/client/config** directory.

On a UNIX server, for example:

- If CFS-IS is installed in /fnsw:

**/fnsw/client/config/local\_CSM\_caches.txt**

On a Windows server, for example:

- If CFS-IS is installed in C:\fnsw:

**C:\fnsw\client\config\local\_CSM\_caches.txt**

- If CFS-IS is installed in the default directory C:\Program Files\FileNet\fnsw:

**C:\Program Files\FileNet\fnsw\client\config\local\_CSM\_caches.txt**

In this file, list the three-part NCH names of the local CSM caches for the remote IS Application Server systems that are local to CE. For example, if the satellite CE system is connected to an IS system in Chicago named lakemich, your configuration file might look like this:

```
page_cache2:lakemich:BigCorp
```

The three-part name consists of the local CSM cache name, the remote Image Services domain name, and the customer's company name, each separated by colons. There can be only one entry for each IS domain. There must be only one name per line, and no leading, trailing, or embedded blanks.

The exact page cache name depends on how many page caches there are on the IS system. The "page\_cache1" is normally the name of the default page cache and is in the main Image Services system. Subsequent page caches would be named "page\_cache2," "page\_cache3," and so on. These names are automatically generated by IS when the caches are created.

All remote page caches for a CFS domain must be in the same domain as the IS system. Only the object name (page\_cache2, for example) can be different.

## Test the CFS-IS Configuration

After you have verified that the conversion is complete and the applications have been successfully switched from Panagon applications to FileNet P8 Platform applications, the IS catalog entries are no longer necessary. When the FileNet P8 Platform applications have been running successfully for a period of time, IS cataloging can be disabled for the relevant IS document classes and the existing catalog entries for those document classes can be deleted. At that point, the catalog export is permanent.

**Caution** Do not federate production documents for test purposes. After documents have been federated, it is not possible to unfederate them.

If you plan to export existing catalog information from IS to CE, **DO NOT** click the **Delete after export** checkbox until you are sure the catalog information is no longer needed.

**NOTE** When FileNet P8 applications query the CE catalog, matches for documents that reside on the IS system could display a size of 0 KB and owner information that indicates the source of the data, such as CFS-IS Import Service.

## Tools

Before you put your CFS-IS system into production, you can test the system by capturing a small number of documents and retrieving them from the CE or IS system or both, depending on your configuration.

Because of the way CFS-IS stores documents and index properties, the behaviors of some standard IS tools could be slightly different than expected when used in a CFS-IS environment. Be sure to read the FileNet Image Services *System Tools Reference Manual* for the latest information on using the following IS tools: .

- dbverify
- ddexim
- deldocs
- INX\_export
- INX\_tool
- ixdbstat
- odrecover
- remove\_docs\_ref
- stdoccopy
- stdocimp
- WRT\_clean

### *nslookup*

#### Description

The **nslookup** command is an operating system tool. It verifies that the domain controller is able to resolve IS server names and NCH\_service names. You might find **nslookup** useful when configuring your network environment.

```
nslookup <IS_server_name>
```

```
nslookup <four-part_NCH_service_name>
```

where:

<IS\_server\_name> is the name of the Image Services Root/Index server, such as ayrton.

<four-part\_NCH\_service\_name> is the four-part NCH domain name of the Image services server, such as senna-filenet-nch-server.

#### Example

```
nslookup ayrton
nslookup senna-yourco-nch-server
```

The nslookup command returns the IP address of the Image Services server.

## *ping*

### Description

The **ping** command is an operating system tool. It verifies that this Content Engine server is able to locate an Image Services server using either the local **hosts** file or the DNS server. You can use these variations of **ping**:

```
ping <IS_server_name>  
ping <IS_server_IP_address>  
ping <nch_service_name>
```

where:

<IS\_server\_name> is the name of the Image Services Root/Index server, such as ayrton.

<IS\_server\_IP\_address> is the IP address, such as 10.14.80.97.

<NCH\_service\_name> is the four-part NCH service name, such as senna-yourco-nch-server.

## Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing  
IBM Corporation  
North Castle Drive Armonk, NY 10504-1785  
U.S.A.

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

IBM World Trade Asia Corporation  
Licensing  
2-31 Roppongi 3-chome, Minato-ku  
Tokyo 106-0032, Japan

**The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:** INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs

(including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation  
J46A/G4  
555 Bailey Avenue  
San Jose, CA 95141-1003  
U.S.A.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

#### COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs.

## Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark

symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at “Copyright and trademark information” at [www.ibm.com/legal/copytrade.shtml](http://www.ibm.com/legal/copytrade.shtml).

Microsoft and Windows are trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product, and service names may be trademarks or service marks of others.

## U.S. Patents Disclosure

This product incorporates technology covered by one or more of the following patents: U.S. Patent Numbers: 6,094,505; 5,768,416; 5,625,465; 5,369,508; 5,258,855.







Program Number: 5724-R81

Printed in USA

SC19-2705-00

