

Course Guide

## **IBM FileNet P8 Platform Administration (V5.5.x)**

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# Course information

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## Course overview

This course teaches you the configuration and administration of an IBM FileNet P8 Platform 5.5.x system. It introduces you to the key concepts of IBM FileNet P8 Platform architecture and organizing the content across the enterprise. You will learn how to build content repositories, configure metadata, create storage areas, manage security, logging, and auditing, run bulk processing, use the sweep framework, extend the functionality with Events and Subscription, migrate and deploy FileNet P8 assets between environments, and configure content-based retrieval searches.

## Intended audience

This course is for administrators and users who are responsible for planning, administrating and configuring an IBM FileNet P8 Platform system.

## Course prerequisites

Participants should have knowledge of or taken the courses in the following areas:

- Familiarity with enterprise content management concepts.

## Topics covered

Topics covered in this course include:

- Introduction to IBM FileNet P8 Platform
- Architecture and domain structures
- Manage logging
- Configure auditing
- Manage storage areas
- Build an object store
- Create property templates and classes
- Modify classes and properties
- Use events to trigger actions
- Configure security for IBM FileNet P8 assets
- Use bulk operations
- Configure content-based retrieval searches
- Work with sweeps
- Move IBM FileNet P8 Platform applications between environments
- Introduction to IBM FileNet P8 content services containers
- Organize content across the enterprise

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- Self-paced training that fits your needs and schedule
- Comprehensive curricula and learning journeys that help you identify the courses that are right for you
- IBM Open badges program

For other resources that enhance your success, bookmark:

- IBM Analytics Skills Gateway (<https://www.ibm.com/services/learning/ites.wss/zz-en?pageType=page&c=C067650S63836C42>)
- IBM Cloud Skills Gateway (<https://www.ibm.com/services/learning/ites.wss/zz-en?pageType=page&c=O602980X82373O75>)
- IBM Knowledge Center: IBM FileNet P8 Platform V5.5.x documentation ([https://www.ibm.com/support/knowledgecenter/en/SSNW2F\\_5.5.0/com.ibm.p8toc.doc/welcome\\_p8.htm](https://www.ibm.com/support/knowledgecenter/en/SSNW2F_5.5.0/com.ibm.p8toc.doc/welcome_p8.htm))

# Introduction to IBM FileNet P8 Platform

In this section, you will learn about the Enterprise Content Management (ECM) concepts, IBM FileNet P8 Platform features, integration options, and components.

## What is Enterprise Content Management?

An ECM system captures, stores, and manages business-related digital assets. ECM is also about:

- Supporting business applications
- Providing users with access to the right information in the context of their application
- Governing information and ensuring you meet business or industry regulations
- Enabling businesses to support a wide-range of document-centric use cases

Enterprise Content Management software provides the following set of core capabilities:

- User interfaces for working with the content
- Metadata management to enable searching and categorizing
- Security to ensure that only people with the correct access can view, edit, or delete documents
- API and programming model for the development of custom solutions
- Event management to automate actions based on events, such as document or metadata creation or updates
- Workflow management to automate document approval
- Records and retention management to govern information and ensure that you can meet business and industry regulations
- Logging and reporting to provide required audit trails
- Tools with which to administer the ECM environment

## IBM FileNet P8 Platform features

IBM FileNet Content Manager is an Enterprise Content Management offering. IBM FileNet Content Manager is also included in other product offerings and is referred to as IBM FileNet P8 Platform. Content Platform Engine (CPE) is the core component of the IBM FileNet P8 Platform. This course uses both IBM FileNet P8 Platform and IBM FileNet Content Manager interchangeably.

IBM FileNet P8 Platform provides the enterprise-level capabilities that are required for solving critical business requirements. The platform contains the following features:

- **Content Management**

Repository services for capturing, managing, and storing your business-related digital assets form the core of the platform. Multiple repositories, called object stores, can be created and managed within a single system to serve your business requirements.

Object stores can be configured to store content in a database, a file system, cloud storage, or a fixed content device, or a combination of these options.

- **Business user environment**

IBM Content Navigator (ICN) is a web client that provides users with a console for working with content from multiple content servers, including content that is stored on Content Platform Engine object stores. ICN can be used with IBM Content Manager (CM8), IBM Content Manager OnDemand (CMOD), any CMIS-compliant repository, and Box.

- **Application environment**

IBM FileNet P8 Platform provides a rich set of APIs that enable you to build custom applications, as well as tailor the out of the box interface ICN.

- **System management**

It provides a complete set of system administration tools.

- **Workflow management**

You can create, modify, and manage business processes, or workflows in the IBM FileNet P8 Platform.

## IBM FileNet P8 Platform integration options

The IBM FileNet P8 Platform provides the baseline components, for enterprise content management (ECM) solutions, that address ECM and business process management requirements.

IBM FileNet P8 Platform is included in other product offerings.

The following components can be added to a system to enable additional capabilities:

- **IBM Datacap**

A data capture product that scans, classifies, recognizes, validates, verifies, and exports data and document images quickly, accurately and cost effectively.

Datacap can be used to automate the import of captured data and scanned documents from Datacap into the IBM FileNet P8 Platform repositories for storage and use in other business applications.

Datacap Navigator is integrated with IBM Content Navigator to give business users a consistent user interface in which to work.

- **IBM Enterprise Records**

IBM Enterprise Records creates and maintains accurate, secure, and reliable records for both electronic and physical information. These records help to place the documents under corporate control and to meet government regulations.

The IBM Enterprise Records administrative interface is integrated with IBM Content Navigator, and while the processing of documents as records can be automated, business users can also declare documents as records using the IBM Content Navigator interface.

- **IBM Business Automation Workflow**

IBM Business Automation Workflow (BAW) provides a platform to create workflow applications to improve productivity.

BAW provides:

- Tools that simplify designing and deploying business solutions
- A ready-to-use interface that is flexible and customizable
- An active-content infrastructure that manages the persisted case object model
- Rich analytics that provide several methods to track and measure workflow business performance
- Ability to identify and incorporate both structured and unstructured content into workflows

- **IBM FileNet Content Federation Services**

IBM FileNet Content Federation Services federate documents from multiple repositories. The documents remain in the source repository; but can be viewed as if they were native FileNet P8 documents.

Examples of supported source repositories include IBM Content Manager and Image Services.

For a complete list of supported repositories, refer to the IBM FileNet P8 Platform V5.5.x Knowledge Center.

## **IBM FileNet P8 Platform components**

The IBM FileNet P8 Platform includes the following components.

- **Content Platform Engine (CPE)**

CPE is the core component of IBM FileNet P8 Platform that provides both content and process services.

Throughout this course, you will be learning about CPE configuration.

- **IBM Content Navigator (ICN)**

ICN is the primary web interface for business users to work with content. Users can browse or search for content in the repositories, access their work items, and set up special team rooms to coordinate and collaborate on content-related activities. ICN is highly customizable. Both IBM Datacap and IBM Enterprise Records can be used through the ICN interface.

IBM Content Navigator also provides:

- A sync service to synchronize content on a business user's desktop and the CPE repository
- An edit service that enables business users to open content directly in the appropriate authoring application
- Role-based redaction to ensure sensitive information in a document is viewed only by the appropriate users
- An integration with Microsoft Office that enables users to access, add, and update content in the CPE repository from the Microsoft Office suite of products
- An integration with Microsoft SharePoint that enables SharePoint users to access content in the CPE repository and to automatically save content added to SharePoint in the CPE repository

- **Content Search Services (CSS)**

CSS provides full content indexing so that text searches can be performed on both document content and metadata.

- **System Dashboard**

The system dashboard can be used to monitor the performance of the servers hosting IBM FileNet P8 Platform components. It also provides a tool for tracking license usage.

## **IBM FileNet P8 Platform solutions**

IBM FileNet P8 Platform provides tools for building solutions and applications that address business needs and challenges in various industries such as banking, academia, and government agencies.

Usually, a solution includes the following elements:

- **Metadata**

Metadata is information about objects, whether they are documents or other kinds of business objects. The metadata classifies the information so that users can find objects, and so that appropriate automated actions can be taken as metadata values are updated.

- **Content storage**

The content of documents needs to be stored securely. The rules around where content should be stored, whether the content should be encrypted, and how long the content should be kept for can be configured easily. Tools are also provided that enable you to move content to different types of storage as part of managing the lifecycle of the document.

- **Searches**

Searches can have a considerable effect on system performance. When designing a solution, a solution builder needs to predict the kinds of searches that are going to be used and create searches to efficiently use the system resources.

- **Security**

There are two primary aspects to securing your system: authentication and authorization.

Authentication determines who has access to the system, while authorization determines what the user can do once they have accessed the system.

- **User interface options**

IBM Content Navigator (ICN) can be used as the start point for your user experience. ICN can be customized and extended by using plug-ins. You can also embed ICN within your own completely custom user interfaces.

- **Automation**

Take advantage of the capabilities within the platform to automate repetitive processes that do not need user interaction. Automation can also be used to trigger processes based on adding or updating content or metadata.

- **Integration**

The IBM FileNet P8 environment can be integrated with other business processes and applications.

## Review Questions

**Question 1:** How would you define an IBM FileNet P8 Platform solution? (Select one)

- A. An object store that contains folders and files
- B. A set of workflows
- C. A solution that addresses a business need
- D. A set of stored searches

**Answer 1:** C

IBM FileNet P8 Platform provides tools for building a solution or application that addresses a business need.

**Question 2:** IBM FileNet P8 Platform is commonly used by which industry? (Select one)

- A. Banking
- B. Academia
- C. Government agencies
- D. All of the above

**Answer 2:** D

IBM FileNet P8 Platform is used by many industries.

**Question 3:** What are the capabilities of an Enterprise Content Management system?  
(Select all that apply)

- A. Providing users with access to the right information
- B. Metadata management to enable searching
- C. Logging and reporting to provide required audit trail
- D. Document viewing

**Answer 3:** A, B, C, and D

An Enterprise Content Management system provides user access & metadata management, logging, auditing, and document viewing.

**Question 4:** Which IBM FileNet P8 Platform component provides the default client interface for business users to work with content? (Select one)

- A. IBM Content Navigator
- B. Content Search Services
- C. Content Platform Engine
- D. System Dashboard

**Answer 4:** A

IBM Content Navigator is the primary web interface for business users to work with content and it can connect to the IBM FileNet Content Manager repositories.

**Question 5:** IBM FileNet P8 Platform integrates with which of the following systems?  
(Select all that apply)

- A. IBM Datacap
- B. IBM Enterprise Records
- C. IBM Business Automation Workflow
- D. IBM FileNet Content Federation Services

**Answer 5:** A, B, C, and D

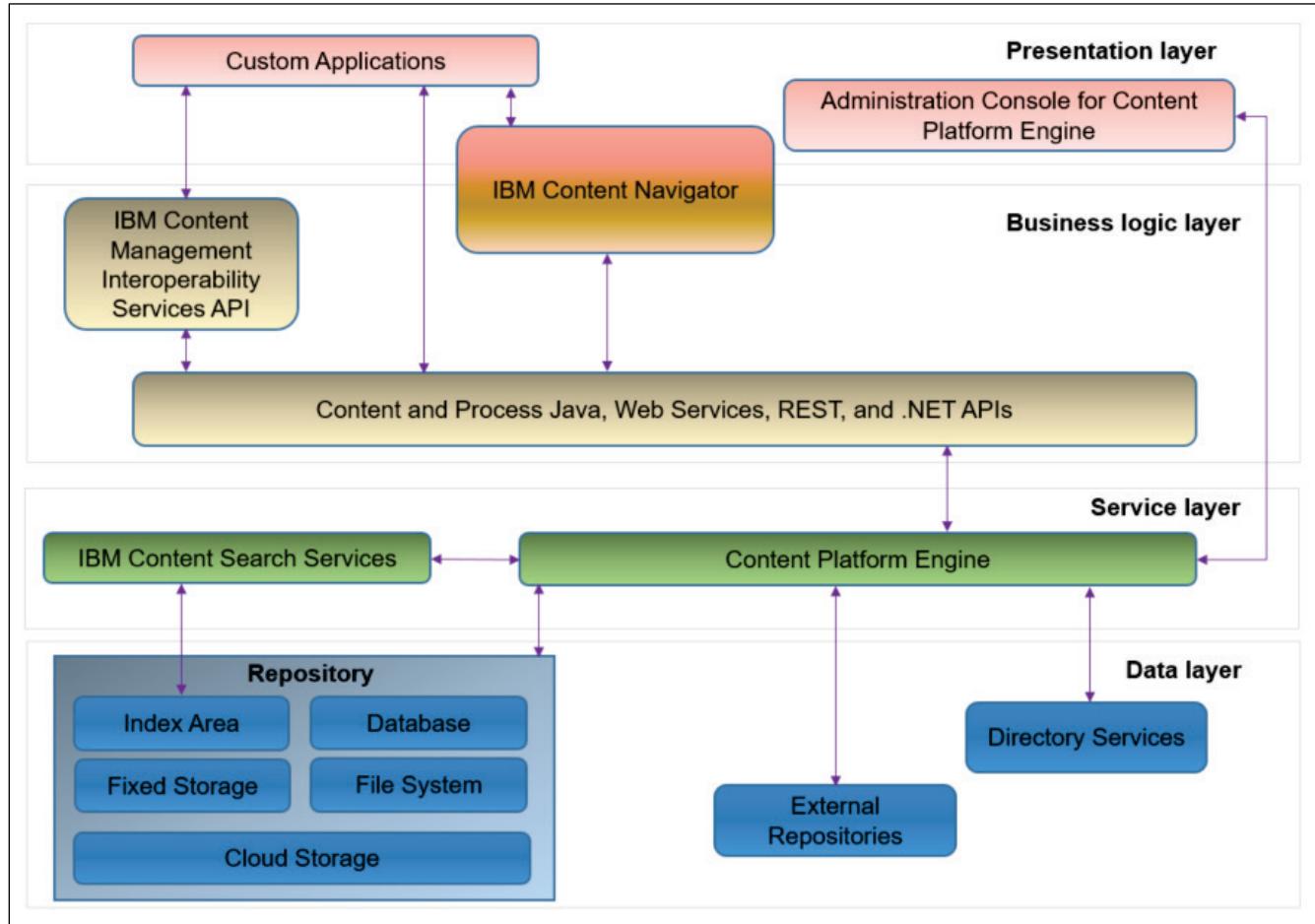
IBM FileNet P8 Platform integrates with IBM Datacap, IBM Enterprise Records, IBM Business Automation Workflow, and IBM FileNet Content Federation Services.

# Architecture and domain structures

In this section, you will learn about the IBM FileNet P8 Platform architecture, P8 domain, and objects present within the domain.

## IBM FileNet P8 Platform Architecture

The IBM FileNet P8 Platform includes back-end services, development tools, and applications that address enterprise content and process management requirements.



- The presentation layer and business logic layer, on the top, focus on the clients that connect to Content Platform Engine.  
IBM Content Navigator (ICN) is the primary web client to manage the content. You can customize and extend ICN and also create custom applications.  
Administration Console for Content Platform Engine is the web client to configure and administer Content Platform Engine.  
The business logic layer includes Content and Process Java, Web Services, REST, and .NET APIs.

- The services layer in the middle includes the core components that make up IBM FileNet P8 Platform.

The Content Platform Engine is the core engine providing both content and process services.

This layer also includes IBM Content Search Services.

- The data layer, which is the lowest layer, includes LDAP directory services, databases, and content storage.

## **Content Platform Engine architecture**

Content Platform Engine is an IBM FileNet P8 Platform component that manages enterprise-wide objects and documents by offering powerful and administration tools. Using these tools, an administrator can create and manage the classes, properties, storage, and metadata that form the foundation of an enterprise content management system.

The Content Platform Engine architecture includes the following aspects:

- **Object-oriented, extensible metadata model**

This model enables Content Platform Engine to provide complex and flexible data representation.

The model includes a rich event framework that provides the means to trigger actions in response to activities performed against Content Platform Engine objects.

- **Content Engine Application programming interfaces (APIs)**

The APIs provide an extensible platform for development.

A Java-based API provides a rich set of Java classes that maps to object store objects, such as Document, Folder, or Property Description.

A Web Service API enables users to author applications in a platform and language-independent manner that expose the object model in a few generic methods suitable for deployment in a web environment.

A Microsoft .NET framework-based API, functionally equivalent to the Java-based API, provides for development of applications that use the .NET framework.

- **Process Engine Application programming interfaces (APIs)**

A Java-based API provides a rich set of Java classes to customize the way that the application interfaces with user, data, and workflow services.

A Web Service API enables users to author applications in a platform and language-independent manner.

The REST Service enables lightweight client applications to access workflow system resources over HTTP and perform the fundamental workflow system operations.

- **Java EE-compliant application server**

Java Platform, Enterprise Edition (Java EE) offers reliability, scalability, and high availability features, and support for a wide range of operating system platforms, application servers, and database technologies.

The Content Platform Engine can be deployed to suit the demands of the enterprise. As the enterprise's needs change, you can reconfigure the system by replacing, adding, or removing servers or applications without bringing the system down. You can add members to web server clusters and Content Platform Engine server clusters at any time.

- **Directory server**

Each P8 domain is associated with one or more LDAP directory servers. The LDAP users and groups are used to define authentication and authorization rights.

- **Database server**

Each environment needs one or more database servers to host the tables that are used to define the P8 domain, the object stores, and workflow systems, as well as the configuration database used by IBM Content Navigator.

- **Content services**

These services are responsible for adding, retrieving, and deleting content and objects from an object store. In addition to servicing requests from enterprise content management (ECM) applications, the content services host various background tasks that maintain all the resources that are associated with each object store.

- **Process services**

These services manage all aspects of business processes (also called workflows).

## **Content Platform Engine resources (P8 Domain)**

The FileNet P8 domain represents a logical grouping of Content Platform Engine physical resources (such as object stores) and the Content Platform Engine servers that provide access to those resources.

Each resource and server belong to only one domain. A server can access any resource in the domain, but cannot access any resource that lies outside of the domain.

Each FileNet P8 Domain contains:

- A Global Configuration Database (GCD) that contains domain level configuration and properties.
- One or more object stores.

An object store is a repository for storing objects (such as documents, folders, and business objects) and the metadata that defines those objects.

Each object store contains:

- Business Objects

Documents, Folders, and custom business objects used by applications

- Metadata

Customizable definitions of business object classes and their properties

- Full Text Indexes

Indexes that allow rapidly searching across document content

- One or more storage areas.

A storage area is a container for content storage.

- Optional workflow system - A workflow system contains the queues, rosters, and event logs that are necessary to create and process workflows.

## **Content Platform Engine tools**

The Content Platform Engine provides the following tools to help with administration and maintenance:

- **Administration Console for Content Platform Engine (ACCE)**

ACCE is a web tool that is used to administer and configure a FileNet P8 Domain, as well as to define and manage object stores and workflow systems.

- **FileNet Configuration Manager**

FileNet Configuration Manager is a graphical user interface to configure and deploy Content Platform Engine instances on an application server. It is generally used during initial installation or when applying software upgrades.

- **FileNet Deployment Manager (FDM)**

FDM is a desktop tool used to move data from one object store to another. FDM is often used to move data from one environment to another. For example, from development to Quality Assurance, and to Production.

FDM can also be used to move workflow and Content Navigator-related information, as well as to reassign object stores to different P8 domains.

- **IBM Content Engine Bulk Import Tool**

Bulk Import Tool is a command-line tool that you can use to import large volumes of documents into a Content Platform Engine object store.

## Sites

A site is created to organize Content Platform Engine resources based on network topology. A site represents a geographical location where resources are connected through a local area network (LAN). Object stores, storage areas, content cache areas, index areas, and virtual servers are all associated with an individual site.

After you create a domain, the domain node contains one site that is named as Initial Site. This site is set as the default site for the domain. The default site contains the associated resources such as virtual servers, index areas, and object stores. Resources that are added to the domain are associated with the default site, unless otherwise specified.

You can create a new site and set it as the default site. You can have multiple sites in a single FileNet P8 domain but each site name must be unique within the domain.

## FileNet P8 component relationships

The components in a FileNet P8 environment are interdependent. Although most components do not require other components to be running to start successfully, the absence of some components can affect processing.

Generally, start the components and related servers in the following order. Reverse the order to shut down.

- Directory services
- Database servers
- Content Platform Engine servers

Content Platform Engine runs as an application within a Java EE application server.

- IBM Content Search Services servers
  - IBM Content Navigator
- IBM Content Navigator runs as application within a Java EE application server
- Other FileNet P8 components

# Activity: Prepare your system - Start IBM FileNet P8 Platform

The environment that is provided with this course requires that you start the IBM WebSphere Application Server that hosts the IBM FileNet P8 Platform components. The WebSphere Admin folder on the desktop includes the scripts that you need to run to start the components.

For this course, you will use a Windows Server 2012 R2 operating system, and the server name is VCLASSBASE.edu.ibm.com.

Complete the following tasks to ensure that your environment is ready and the services are running before working on other activities in the course.

## Log in to the system.

If the system is powered off, power the system on.

- Log in to the operating system by using the following credentials:
  - User: **p8admin**
  - Password: **FileNet1**

## Verify that the WebSphere Application Server deployment manager and node agent started.

- Click the **Services**  shortcut on the taskbar.
- If the **IBM WebSphere Application Server V9.0 - Dmgr01** service does not have the Running status, then start it by right-clicking the service and selecting **Start**.
- If the **IBM WebSphere Application Server V9.0 - Node01** service does not have the Running status, then start it by right-clicking the service and selecting **Start**.

## Start the WebSphere Application Server application servers.

Two application servers are needed: The *server1* application server runs Content Platform Engine (CPE) and the *ICNserver* application server runs IBM Content Navigator (ICN). Because ICN must be deployed in its own application server instance (deployed into a single JVM). Running ICN and CPE in the same JVM is not supported. CPE uses the port number 9080 and ICN uses 9081.

In this task, you will start *server1* first and then *ICNserver*. *Server1* usually starts in a couple of minutes and *ICNserver* can take longer.

- On the **Windows desktop**, open the **WebSphere Admin** folder.

- Right-click **\_1 Start server1.bat**, and then select **Run as administrator**.  
Click **Yes** if prompted to allow the program to make changes.  
Wait for the command window to close.
- Right-click **\_2 Start ICNserver.bat**, and then select **Run as administrator**.  
Click **Yes** if prompted to allow the program to make changes.  
Wait for the command window to close.

## Troubleshooting.

- If any of the clients are not coming up, verify that the following two services are running:
  - IBM WebSphere Application Server V9.0 - Dmgr01
  - IBM WebSphere Application Server V9.0 - Node01
- Stop and start the components  
In the WebSphere Admin folder, stop the two application servers and restart them.
  - Right-click **\_3 Stop ICNserver.bat** and then select **Run as administrator**.  
Wait for the command window to close.
  - Right-click **\_4 Stop server1.bat** and then select **Run as administrator**.  
Wait for the command window to close.
  - Right-click **\_1 Start server1.bat** and then select **Run as administrator**.  
Wait for the command window to close.
  - Right-click **\_2 Start ICNserver.bat** and then select **Run as administrator**.  
Wait for the command window to close.

Do not start the next script until the command window closes for the previous script.

# Activity: Explore the core IBM FileNet P8 Platform applications

In this activity, you will check the IBM FileNet P8 components are running and then you will use the WebSphere Integrated Solutions console to explore the core IBM FileNet P8 Platform applications in WebSphere Application Server.

In this activity, you will accomplish the following:

- Check the FileNet P8 system components are running.
- Examine the IBM FileNet P8 Platform applications.
- Explore the interdependencies between IBM Content Navigator and Content Platform Engine.

## Check the IBM FileNet P8 components are running.

In this activity, you will verify that all the components that are used in this course for the IBM FileNet P8 system are running. The IBM FileNet P8 system includes Content Platform Engine (CPE) with two primary services (content and process) and the IBM Content Navigator (ICN) client application. Because these two applications rely on more software, testing the two applications also ensures that the underlying software is also functioning properly within your system.

- Ensure that the IBM FileNet P8 Platform components are started.

If you have not started them, start the components by using the earlier activity: *Prepare your system - Start IBM FileNet P8 Platform*.

- In the **Mozilla Firefox** browser, click the **Bookmarks** menu and then select **System Health > CE Ping**

You can also enter the following URL for the ping page:  
<http://vclassbase:9080/FileNet/Engine>

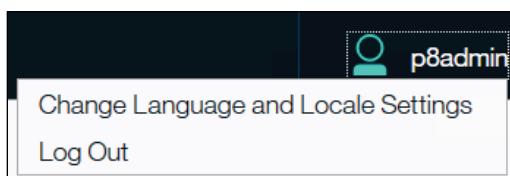
- Verify that the **Content Engine Startup Context (Ping Page)** is displayed to indicate that Content Platform Engine content services are functioning properly.

Content Engine Startup Context (Ping Page)	
Key	Value
Local Host	VCLASSBASE
Start Time	Mon Mar 11 16:33:30 EDT 2019
Product Name	P8 Content Platform Engine - 5.5.2.0

This page contains information about the IBM FileNet P8 system including the product name and version, and log files location.

- In the **Mozilla Firefox** browser, open a new tab, click the **Bookmarks** menu and then select **System Health > PE Ping**  
You can also enter the following URL for the ping page:  
<http://vclassbase:9080/peengine/IOR/ping>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **OK**.
- Verify that the **Process Engine Server Information (Ping Page)** is displayed to indicate that Content Platform Engine process services are functioning properly.  
This page contains information about the IBM FileNet P8 system including the product name and version, and log files location.
- In the **Mozilla Firefox** browser, open a new tab, click the **Bookmarks** menu and then select **System Health > FileNet P8 System Health**  
You can also enter the following URL: <http://vclassbase:9080/P8CE/Health>
- Verify that the **IBM FileNet Content Manager - CE System Health** page is displayed.  
This page includes information about P8 Domain (EDU\_P8), object stores, and other resources. Each item has a link to view more details. The green circle shows these resources are available.
- Click the **Object Stores** link under the **Resources** section and then verify that the available object stores are listed.
- In the **Mozilla Firefox** browser, open a new tab, click the **Bookmarks** menu and then select **System Health > ICN Ping**  
You can also enter the following URL for the ping page:  
<http://vclassbase:9081/navigator/ping.jsp>  
Takes a few seconds for the page to open.
- If prompted to log on, type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **OK**.
- Verify that the **IBM Content Navigator Ping Page** is displayed to indicate that IBM Content Navigator application is functioning properly.  
This page contains information about Content Navigator including the product name and version.
- In the **Mozilla Firefox** browser, open a new tab, click the **Sample Desktop** bookmark.  
You can also enter the following URL: <http://vclassbase:9081/navigator/>

- If prompted to login, type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Verify that the Content Navigator Desktop (called **Sample Desktop**) opens with the **Browse** view (indicated on the upper left).  
This desktop is configured to browse the LoanProcess object store by default (indicated on the upper right).
- In this view, you can browse to folders, view documents, and manage the content. If you get the Browse page, it indicates that the following components are running and communicating within your student system:
  - A database system  
Your student system uses the IBM DB2 database software. Every time a user logs in to the desktop, the desktop configuration is loaded from the DB2 database. This step demonstrates that the database used by the FileNet P8 Platform is functional.
  - An LDAP directory service to handle user authentication. Your student system uses Active Directory.
- Click the **head and shoulder icon** on the banner, select **Log Out** to log out of **IBM Content Navigator** and then close the browser.



In a business scenario, if an IBM FileNet P8 environment has multiple CPE and ICN servers, the ping page only indicates that the one server that is used in the ping URL is verified. This statement applies even if you use a load balancer URL. For a multi-server environment, ping each server to ensure the whole environment is up and running.

## **Examine the IBM FileNet P8 Platform applications.**

In this task, you will open the WebSphere Integrated Solutions Console and observe the IBM FileNet P8 Platform applications.

- In the **Mozilla Firefox** browser, click the **WAS** bookmark or enter the following URL: <https://vclassbase:9043/ibm/console/logon.jsp>
- Type **wasadmin** for the **User ID** field, **FileNet1** for the **Password** field, and then click **Log in**.

The console opens.

- On the left pane, expand the **Applications > Application Types** node and then click **WebSphere enterprise applications**.
- On the right pane, verify that the **Application Status** column shows a green arrow to indicate that the following two applications are running.
  - FileNetEngine** (Content Platform Engine)
  - navigator** (IBM Content Navigator)

Select	Name	Application Status
You can administer the following resources:		
<input type="checkbox"/>	<a href="#">DefaultApplication</a>	
<input type="checkbox"/>	<a href="#">FileNetEngine</a>	
<input type="checkbox"/>	<a href="#">navigator</a>	

These two key applications are required for IBM FileNet P8 Platform. You will not be using the DefaultApplication and starting it is not required.

- Click **FileNetEngine** to open it.  
It takes a few moments to open.  
You can also right-click FileNetEngine and select Open Link in New Tab.
- Under the **Modules** section, click **Manage Modules**.  
A list of modules are shown that make up the *FileNetEngine* application.  
The acce application is the Administration Console for Content Platform Engine tool.
- If you opened the **FileNetEngine** application in a separate tab, close the tab.

## Explore the interdependencies between IBM Content Navigator and Content Platform Engine.

In this task, you will stop the FileNetEngine application (Content Platform Engine) and open an IBM Content Navigator (ICN) desktop. ICN is the primary web client for business users to work with content and workflow tasks. ICN connects to the IBM FileNet Content Manager repositories and uses the repository for authentication.

- If it is not already open, from the left pane, click the **Applications > Application Types > WebSphere enterprise applications** node.
- On the right pane, select the box next to **FileNetEngine** and click **Stop**.
- Wait until a **red X** is shown to the right of **FileNetEngine** on the **Application Status** column.

- Log out of the **WebSphere Integrated Solutions Console** and close the browser.
- Open the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>.
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.

You get an error with the message that the repository is not available. IBM Content Navigator (ICN) attempts to load the desktop but it cannot load the desktop because FileNetEngine is not running and ICN cannot connect to the repository.

- Close the browser and reopen to log in to the **WebSphere Integrated Solutions Console (WAS)** again with the same user ID and password as above (**wasadmin/FileNet1**).
- On the left pane, expand the **Applications > Application Types** node and then click **WebSphere enterprise applications**.
- On the right pane, select the box next to **FileNetEngine** and click **Start**.
- Wait until a green check mark is shown to the right of FileNetEngine on the **Application Status** column.
- Click the **Refresh**  icon next to the **Application Status** column header to refresh the view.
- Log out of the **WebSphere Integrated Solutions Console** and close the browser.
- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>.
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.

- This time, the desktop opens without any errors and the **LoanProcess** Repository is listed in the **Browse** mode.

The screenshot shows the 'Sample Desktop' interface. On the left, there's a navigation bar with a folder icon labeled 'Browse'. Below it, a tree view shows the 'LoanProcess' repository expanded, containing 'CodeModules', 'Loan Entry Template', 'Loan Types', 'Loans', and 'Real Estate'. To the right of the tree view are three buttons: 'Refresh', 'Add Document', and 'New Folder'. Further down, a table titled 'LoanProcess' lists items under the 'Name' column, with 'CodeModules' and 'Loan Entry Templates' visible.

Name
CodeModules
Loan Entry Templates

- Logout of the ICN desktop and close the browser.

# Activity: Locate P8 domain structures

In this activity, you will use Administration Console for Content Platform Engine to locate P8 domain structures.

In this activity, you will accomplish the following:

- Log in to Administration Console for Content Platform Engine (ACCE)
- Explore the domain level properties.
- Locate the Global Configuration folder structure.
- Locate the Object Stores folder structure.
- Find specific objects in a FileNet P8 Domain (Optional)

## Log in to Administration Console for Content Platform Engine (ACCE).

Throughout this course, Administration Console for Content Platform Engine (ACCE) is also referred to as ACCE or the administration console.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: **http://vclassbase:9080/acce**
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.

This account is created on the student system and it has administrative rights on the FileNet P8 Domain.

Administration Console for Content Platform Engine (ACCE) opens.

On the right pane, there are a series of subtabs, with the General subtab selected.

## Explore the domain level properties.

In this task, you use ACCE to explore the domain level properties.

- On the right pane of ACCE, under the **General** subtab, notice the properties that are listed.

The screenshot shows the IBM Administative Console for Content Platform Engine interface. On the left, there's a navigation tree with 'EDU\_P8' selected. The main pane shows the 'General' subtab of the 'EDU\_P8' domain configuration. The properties listed are:

- Name: EDU\_P8
- Id: {1B6358E8-3B59-480C-BC26-F9F7AA7AA}
- Domain type: Standalone

Buttons for 'Save' and 'Refresh' are visible at the top of the main pane.

Name, ID, and type of the P8 domain are shown. The name of the domain for the student system is EDU\_P8.

- Select the **Properties** subtab, click the **Property Name** cell to sort the list alphabetically and then review the properties that are listed.  
The Default Site property has Initial Site as the value.
- Scroll down to the **Subsystem Configurations** property, and then click the blue down arrow to the right of that property.

The screenshot shows the 'Properties' subtab for the EDU\_P8 domain. The 'Subsystem Configurations' property is selected, and its dropdown menu is open, displaying a list of subsystem configurations:

- 10) Text Search Configuration
- 11) Auditing Configuration
- 12) Thread Pool Configuration
- 13) Sweep Configuration

Observe that a list of different subsystem configurations displays. When you select a subsystem, it opens as a separate tab and the configuration can be updated.

- If you opened any subsystem tabs, you can close them.

- In the **EDU\_P8** main tab, click the **Security** subtab.  
In the security tab is where you grant access to the entire domain.

The screenshot shows the 'EDU\_P8' main tab with the 'Security' subtab selected. At the top, there are 'Save' and 'Refresh' buttons. Below them, tabs include 'General', 'Properties', 'Security' (which is underlined), 'Directory Configuration', and 'Server Cache Subsyst'. A note says 'customize a predefined permission as needed. Learn more...'. Under 'Access Permissions', there are buttons for 'Add Permissions...', 'Edit...', and 'Remove'. It shows a table with 2 total rows:

	Name	Source	Permission Type	Permission Group	Apply To
<input type="checkbox"/>	#AUTHENTICATED-USERS	Direct	Allow	Custom	This object and children
<input type="checkbox"/>	p8admin	Direct	Allow	Full Control	This object and

In this domain (EDU\_P8), the p8admin user has full control on the domain and all its children. The default #AUTHENTICATED-USERS group has custom permission access for the domain and its immediate children.

- Click the **Directory Configuration** subtab.  
Notice that EDU\_AD is defined for the P8 domain. A FileNet P8 Domain can be configured to use multiple directory configurations.
- Click the **EDU\_AD** link in the **Name** column.  
The EDU\_AD tab opens.
- In the **EDU\_AD** tab, examine the properties that are displayed, such as **Directory Server Type** and then close the tab.  
The directory configuration is generally configured with the FileNet Configuration Manager. ACCE can be used to update the settings or just to view them.
- Click the **Server Cache Subsystem** tab and then review the properties.  
You optimize the efficiency of the server cache for improving the system performance.
- Optionally, click each of the subsequent tabs to review the properties.  
Click the forward arrow to access more tabs.

- Click the down arrow at the top right and select **SMTP Subsystem** tab.  
Click the SMTP Subsystem tab, if the content is not displayed. You can also click Refresh. In this tab, you can configure an SMTP mail server to set up email notifications. Mail services are not enabled on this domain for the student system.
- Click the **Workflow Subsystem** tab.  
In this tab, you enable Workflow and Case Analyzer and adjust tuning parameters.

## Explore the Global Configuration folder structure.

In this task, you explore the properties and objects that are located in the Global Configuration folder.

- On the left pane of the **EDU\_P8** tab, expand **Global Configuration > Administration > Sites > Initial Site (Default)**.  
This is the site that is created when you create a P8 domain. This site is set as the default site for the domain.  
You can create a new site and set it as the default site. You can have multiple sites in a single FileNet P8 domain.
- Observe that there are several nodes listed under the **Initial Site (Default)** node.  
The default site contains the associated resources such as virtual servers, index areas, and object stores.  
Any resources that are added to the domain are associated with the default site, unless otherwise specified.
- Select the **Initial Site (Default)** node on the left pane, explore the subtabs that are available for the **Initial Site (Default)** tab, and then close the tab.
- On the left pane of the **EDU\_P8** tab, expand **Global Configuration > Administration > Database Connections** and select **FNOSDS**.  
The FNOSDS tab opens.
- On the right pane, click the **Properties** subtab of the **FNOSDS** tab and then examine the data source properties and the database type.
- Click the **Object Stores** subtab.  
The object stores that use this database connection are listed.
- Click the **Sales** object store.  
A new tab opens for the Sales object store. You will explore the object store in the next task.

- Close the **Sales** tab by clicking the **X** on the tab, and then close the **FNOSDS** tab by clicking **Close**.
- From the **EDU\_P8** tab, on the left pane, collapse the **Administration** folder, expand the **Global Configuration > Data Design** and click the **Add-ons** folder.

On the right pane, object store add-ons are listed. When you create a new object store, you choose from this list of Add-ons. Each Add-on provides predefined metadata that extends the basic operation of IBM FileNet P8 Platform. For example, Thumbnail Extensions are required if your object store needs to support thumbnails.

- Close the **Add-ons** tab.
- On the left pane, notice the **Data Design > Marking Sets** folder.

Marking Sets are primarily used for records management. No Marking Sets are defined in this domain.

## **Explore the Object Stores folder structure.**

In this task, you explore the objects and properties that are located in the Object stores folder.

- On the left pane of the **EDU\_P8** tab, collapse the **Global Configuration** folder and expand the **Object Stores** folder.

A list of object stores that exist in the **EDU\_P8** domain are shown.

- Click the **Sales** object store.

The Sales tab opens.

- On the left pane, expand the **Administrative > Workflow system** and observe that there are nodes for **Connection Points** and **Isolated Regions**.

To learn more about how to configure a workflow system, refer to the *F231G: IBM Case Foundation 5.2.1 - Configure the workflow system* course.

- On the left pane, collapse **Administrative**, expand the **Browse** folder and then verify that there are two main nodes: **Root Folder** and **Unfiled Documents**.
- Expand **Root Folder** to view all the top-level folders that exist in this object store and then click **Orders** folder to open it.
- From the **Orders** tab > **Contents** subtab on the right, notice a list of documents that are filed in this folder.
- Open a document by clicking the link in the **Containment Name** column.

The document opens in a separate tab with the document name. You can access the properties and settings of the document.

- On the left pane, collapse the **Root Folder** and then click the **Unfiled Documents** node.

If any documents are added to this object store but not filed in a folder, they will be listed under this node.

- Close all open tabs on the right pane.
- On the left pane, collapse the **Browse** folder and expand the **Data Design** node.

Under this node, are objects that are used to define metadata such as property templates, classes, and choice lists.

- Expand **Classes > Document** to view all the document subclasses.
- Expand the **Order** subclass and notice that there are sub-classes that are called **ProductOrder** and **ServiceOrder**.
- Click **Order** to open the Order tab on the right pane.
- From the **Order** tab, click the **Property Definitions** subtab to access the property definitions that are defined for the **Order** class.

You will explore these property definitions in the following steps.

- Collapse the **Classes** node, expand the **Property Templates** folder and then scroll down to **customer\_name**.

You can type the name in the filter field to find it quickly.

This is one of the property definitions that you saw for the Order class in the prior step.

- Click **customer\_name** to open it and explore the subtabs under the **customer\_name** tab.
- Close all open tabs on the right.

## **Find specific objects in a FileNet P8 Domain.**

In this task, you will use Administration Console for Content Platform Engine (ACCE) to find specific objects in the FileNet P8 Domain. For more details, refer to the previous tasks.

- In **ACCE**, open the **Sales** object store, if it is not already opened.
- How many property definitions are defined for the **PriceQuote** document class?
- What are the names of the two workflows in the **Workflows** folder?

- Verify your answers:

The PriceQuote class has three property definitions: customer\_name, Description, and price.

The screenshot shows the 'Data Design' section on the left with a tree view of various templates and classes. The 'PriceQuote' class is selected and highlighted in blue. On the right, the 'Class Definition: PriceQuote' window is open, showing the 'Property Definitions' tab. This tab includes buttons for 'Add', 'Remove', and 'Propagate'. There are also checkboxes for 'Display inherited properties' and 'Display system properties'. A table lists the properties with their data types and 'Is Name' status:

Property	Data Type	Is Name
customer_name	String	
Description	String	
price	Float	

The names of the two workflows are: Sample Workflow, and Test Subscription Workflow.

The screenshot shows the 'Browse' section on the left with a tree view of various document and workflow folders. The 'Workflows' folder is selected and highlighted in blue. On the right, the 'Folder: Workflows' window is open, showing the 'Contents' tab. It includes buttons for 'Save', 'Refresh', 'Actions', and 'Close'. Below these are buttons for 'Refresh' and 'Actions'. A table lists the workflows:

Containment Name	Document Name
Sample Workflow	Sample Workflow
Test Subscription Workflow	Test Subscription Workflow

- Click the Head and Shoulder icon on the banner and select **Log out** to log out of the Administration Console for Content Platform Engine and then close the browser.

# Activity: Use IBM Content Navigator

IBM Content Navigator (ICN) is the primary web client for business users to work with content and workflow tasks. ICN client can be configured to connect to the IBM FileNet Content Manager repositories. Users can browse or search for content in the repositories, access their work items, and do many more content-related activities. In this activity, you will use the IBM Content Navigator Sample Desktop that is configured for the student system and explore a very simplified view of the application.

In this activity, you will accomplish the following:

- Log in to IBM Content Navigator desktop.
- Explore the repositories, folders, and documents.
- Add a folder and a document.

## Log in to IBM Content Navigator desktop.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.

The Content Navigator Desktop opens.

- Notice that the default page opened is **Browse**, as indicated in the upper left of the page and the default repository opened is **LoanProcess**.
- From the upper left, click the down arrow next to **Browse** and notice that the following features are listed: **Home**, **Browse**, **Search**, **Entry Template Manager**, **Work**, and **Administration**

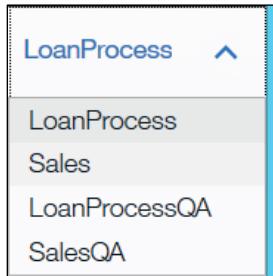
Each feature in an ICN desktop open as a page that contains a set of functionality and actions. For example, on the Browse feature page, you can browse the folders and documents, and you can perform actions associated with documents and folders.

Leave the Browse page in Content Navigator open for the next task.

## Explore the repositories, folders, and documents.

P8admin user has access to multiple repositories. The LoanProcess repository opens by default. In this task, you will access other repositories and check the folders, documents, and the details for the documents.

- To open a different repository, click the down arrow next to **LoanProcess** on the upper right of the page and then select any of the available repositories from the list to access the content of that repository.



All the repositories that are configured for this desktop are shown in the list.

- Select the **Sales** repository.

This is the repository that you explored in the Administration Console for Content Platform Engine (ACCE) tool in a previous activity.

On the left pane, under the Sales repository, a list of top-level folders, to which the user has access is shown.

- Click **Workflows** and then observe that there are two documents filed in this folder.

This is the folder that you explored in the ACCE tool in a previous activity.

The documents in the selected folder are shown on the right pane. If there are any subfolders, they will also displayed.

- On the left pane, click the **Orders** folder, select a document (for example, **PO 3411.tif**) by clicking the document title.

Single-click the document to view the properties on the lower right pane. A double-click opens the document in the Viewer (for the document mime types that are configured for this desktop).

Content Navigator provides a thumbnail view of the document on the upper right pane.

- Review the information that is shown in the **Properties** section on the right pane.

The document class is ProductOrder. It includes many custom properties that are specific to product order documents, such as `customer_id`, `customer_name`, `po_number`, and `product_ids`.

- Double-click the **PO 3411.tif** document title.

The document opens in the Viewer.

Notice that there are controls to magnify, rotate, and invert at the top. There are more controls on the left to add annotations to the image.

- Close the Viewer and leave Content Navigator open for the next task.

## Add a folder and a document.

In this task, you create a folder and a document in an object store using the IBM Content Navigator (ICN) desktop.

- From the Browse page, click the down arrow next to **Sales** on the upper right and select the **LoanProcess** repository.

You can also add folders and documents in any of the other repositories.

- Click **New Folder** from the toolbar.
- In the **New Folder** page, type **SampleFolder** for the **Folder Name** field.

Leave the default values for all the other fields. Observe the Folder class and security that is assigned to this folder.

- Click **Add**.
- Back on the **Browse** page, double-click **SampleFolder** to open the new folder, and then click **Add Document** from the toolbar.
- In the **Add Document** page, type **SampleDoc** for the **Document Title** field.
- For the **What do you want to save?** field, click **Browse**.
- On the **File Upload** page, select any file from the **C:\Training\F2810G\SampleDocs** folder and then click **Open**.

Back on the Add Document page, leave the default for all the other fields. Observe the Document class and security that is assigned to this document.

- Click **Add** and then back on the **Browse** page, verify that the new document is listed.
- Click the **head and shoulder icon** in the banner, select **Log Out** to log out of IBM Content Navigator and then close the browser.

Throughout this course, you will be using IBM Content Navigator desktop to add content and modify properties.

IBM Content Navigator (ICN) courses provide details on ICN administration and on using ICN to manage the IBM FileNet Content Manager repository content.

# Manage logging

The Content Platform Engine, which is the main component of IBM FileNet P8 Platform, provides logging capabilities for tracking functional issues and troubleshooting. In this section, you will learn how to monitor the system logs and configure trace logging for troubleshooting.

## Content Platform Engine System Logs

Content Platform Engine produces several log files during normal operation. Following are the primary troubleshooting tools for the administrator:

- p8\_server\_error.log
- pesvr\_system.log
- p8\_server\_trace.log

You must become familiar with normal log entries and monitor these log files to observe changes in behavior that might indicate a problem and to ensure that log files are managed. Keep the files to a reasonable size, roll over to new files and delete old ones when you no longer need them.

If the organization uses workflows, the following tools are available to monitor the workflow system:

- vwtool
- vwmmsg
- pelog
- peverify

The IBM Case Foundation administration courses will help you use these tools effectively.

## Default location of logs

By default the Content Platform Engine logs are stored in the following locations:

- WebSphere Application Server:  
`<install_root/profiles/profile_name/FileNet/server_instance_name>`  
Example:  
`C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\FileNet\server1`
- WebLogic Server:  
`bea/user_projects/domains/domain_name/FileNet/AdminServer`

You can change the location where the files are stored. The Content Engine Startup Content page (CE Ping page) shows the path configured for the log files. In a clustered environment, each server will contain its own Content Platform Engine log files. They are located in the `server_instance_name` under the current working directory of the deployed application.

## Web application server logs

When troubleshooting IBM FileNet P8 Platform, you will need to collect the logs from the Content Platform Engine as well as the logs from the web application server. IBM Content Navigator, which provides the user interface for IBM FileNet P8 Platform, logs errors and entries in the web application server's logs.

Each web application server generates its own logs.

The following list contains supported web application servers, default path for the log files, and the name of the log files in the order of importance.

### WebSphere

- Location: `install_root/profiles/profile_name/logs/server_name`
- Examples of log locations:

WebSphere (Windows): `C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\logs\server1`

WebSphere (Linux):

`/opt/ibm/WebSphere/AppServer/profiles/AppSrv01/logs/server1`

- Log files:

- `SystemOut.log`
- `SystemErr.log`
- `startServer.log`
- `stopServer.log`

### WebLogic

- Location: `oracle_home/admin/domain_name/aserver/servers/AdminServer/logs`
- Examples of log location:  
`C:\bea\user_projects\domains\base_domain\servers\AdminServer\logs`

- Log files:
  - AdminServer.log
  - access.log
  - Base\_domain.log

Note that the MustGather technote

(<https://www.ibm.com/support/docview.wss?uid=swg21308231>) provides suggestions for what data and logs to collect when reporting an issue with support. If your organization has a dedicated web application server administrator, you will need to collaborate to capture the requested web application server logs.

## Trace logs

Trace logs are used to troubleshoot specific issues. Trace logging is typically implemented to collect and record information about application failures in test or production environments. If you open a support call, the representative might request that you enable trace logging and reproduce the issue. In that situation, the representative recommends which subsystem flags to enable and what level of detail to collect.

You can configure trace logging at the domain level or the site level. The site-level configuration takes precedence over any domain level settings. Site level configuration is used in organizations that have servers and users in more than one geographical location. For details about Domain and Site, refer to the *Architecture and domain structures* section in this course.

Use Administration Console for Content Platform Engine to configure trace logging, including configuring the level of details for server trace logging and setting the location of the trace log file. The configuration is done on the Trace Subsystem tab of the domain properties. The default file name is p8\_server\_trace.log.

Disable trace logging when you no longer need it. Trace logs can grow quickly and impact system performance and disk space.

## Guidelines for monitoring log files

- Establish a baseline and know what to expect.

Part of detecting problems is being aware of what normal activity looks like. If you establish a baseline of activity and you are familiar with the normal error messages that your system generates, you can better detect anomalies, such as new or more frequent error messages.

- Monitor logs regularly.

Watch for new error messages and any change in error log size.

Example: If the size of a log file is normally 64 KB, and on one day it shows 100 KB

Log level sizes can be a clue that something is wrong. For instance, a single error might produce a new log entry every 5 minutes. This new log entry causes the log file to grow much more quickly, which you first detect by observing the change in the log file size.

Tools such as ECM System Monitor can be used to generate alerts when unusual activity occurs.

- Increase monitoring after any system changes.

Example: Patches applied

- Keep records of normal logs for comparison purposes.

If you keep a week of logs each month, you have comparison information to use in case of a change. If you keep more than that, you might be using more space than you need. If there no major changes to the log behavior after a year or so, you might decide to keep a week of logs for the whole year.

# Activity: View and archive system logs

In this activity, you locate the Content Platform Engine logs and the WebSphere Application Server logs. You shut down the web application server to archive the logs. You restart the web application server and examine the new logs created.

In this activity, you will accomplish the following:

- Locate the Content Platform Engine logs.
- Locate the WebSphere Application Server logs.
- Disable WebSphere Application Server trace logging.
- Archive old log files.
- Examine the new log files.

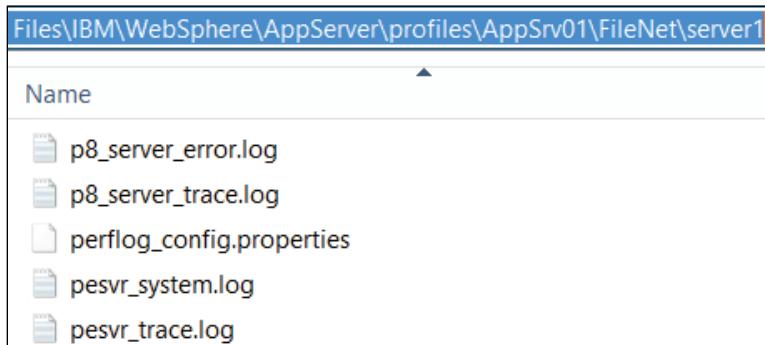
## Locate the Content Platform Engine logs.

- Ensure that the IBM FileNet P8 Platform components are started.  
If you have not started them earlier, start the components by using the earlier activity: *Prepare your system - Start IBM FileNet P8 Platform*.
- In the **Mozilla Firefox** browser, open **Content Engine Startup Context (Ping Page)**.
  - Use the bookmark in the **Bookmarks** menu > **System Health > CE Ping** or enter the following URL: <http://vclassbase:9080/FileNet/Engine>
- On the Ping page, scroll down and then note down the value for the **Log File Location** key.

<b>Log File Location</b>	C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\FileNet\server1
--------------------------	--

- In a **Windows Explorer** window, navigate to that folder path: **C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\FileNet\server1**  
You can copy the value from the Ping page and paste it on Windows Explorer.

- Notice that there are four log files:
  - p8\_server\_error.log
  - p8\_server\_trace.log
  - pesvr\_system.log
  - pesvr\_trace.log



- Minimize the Windows Explorer window.

## Locate the WebSphere Application Server logs.

- In a Windows Explorer window, navigate to the C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\logs\server1 folder and notice that there many log files:
  - SystemOut.log
  - SystemErr.log

These two files are most often referenced.

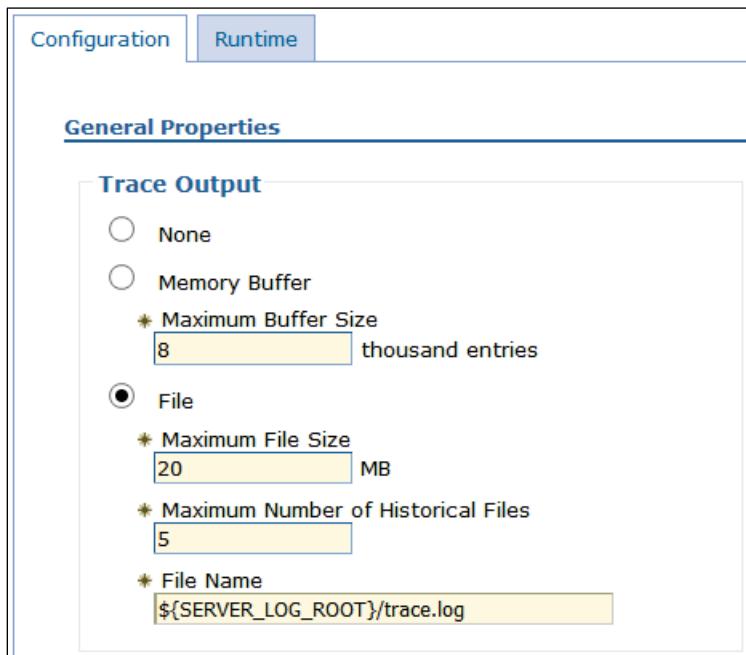
## Disable WebSphere Application Server trace logging.

In this task, you disable trace output for the WebSphere Application Server. The student system is configured with the trace output enabled.

- In the Mozilla Firefox browser, click the **WAS** bookmark or enter the following URL: <https://localhost:9043/ibm/console/>
- Type the following values for user ID and password and click **Log in**.
  - User name: **wasadmin**
  - Password: **FileNet1**
- On the left navigation pane, expand **Troubleshooting** and then click **Logs and trace**.
- On the right pane, click the **server1** link in the **Server** column.

- Click the **Diagnostic Trace** link under **General Properties** section.

On the Configuration tab of the Diagnostic trace service page, notice that you can control the Maximum File Size, Maximum Number of Historical Files to keep before overwriting, File Name, and location of the trace log.



- On the **Configuration** tab, select **None** to disable the trace output and then click **OK** at the end of the page.
  - In the **Messages** section, click **Save** to save the configuration.
  - Log out of the **WebSphere Integrated Solutions Console** and close the browser.
- The change does not take effect until WebSphere Application Server is restarted. You restart WebSphere Application Server in the next task.

## Archive old log files.

In this task, you stop the server and archive the WebSphere Application Server and Content Platform Engine logs.

- Open the **WebSphere Admin** folder on the desktop, right-click the **\_4 Stop server1.bat** file, and then select **Run as administrator** from the list.
  - Click **Yes** when you are prompted with the **User Account Control** dialog box to allow the program to run.
- Wait for the operation to complete (the command window closes).
- Minimize the **WebSphere Admin** folder window.

- Maximize the **Windows Explorer** window where you viewed the Content Platform Engine log files earlier: **C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\FileNet\server1**.
- Create a folder that is called **Archived\_CPE\_Logs** (this name is not critical) in this directory to store the archived Content Platform Engine logs and then move all the four \*.log files to the new folder.
- On the **File Access Denied** dialog box, select the **Do this for all current items** option and then click **Continue** to move the files.
- Minimize the **Windows Explorer** window.  
Maximize the Windows Explorer window where you viewed the WebSphere Application Server log files earlier: **C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\logs\server1** folder.
- Create a folder that is called **Archived\_WAS\_Logs** (this name is not critical) in this directory to store the archived WebSphere Application Server logs and move the **SystemOut.log**, **startServer.log**, and **SystemErr.log** files to the new folder.
- On the **File Access Denied** dialog box, select the **Do this for all current items** option and then click **Continue** to move the files.
- Minimize the **Windows Explorer** window.
- Open the **WebSphere Admin** folder on the desktop, right-click the **\_1 Start server1.bat** file, and then select **Run as administrator** from the list.
- Click **Yes** when you are prompted with the **User Account Control** dialog box to allow the program to run.  
Wait for the operation to complete (the command window closes).
- Minimize the **WebSphere Admin** folder window.

## Examine the new log files

If no log files exist, the Content Platform Engine (CPE) and the WebSphere Application Server create new logs at startup.

- Maximize the **Windows Explorer** window where you viewed the CPE log files earlier: **C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\FileNet\server1**.
- Notice the four log files that are created with the current date and time.

- Right-click the **p8\_server\_error.log** file, select **Edit with Notepad++**, and examine the log entries that are created during startup.  
Cancel any prompts to update to the Notepad++ version.  
Normally, there are no errors and only INFO entries are found on the page.
- Maximize the **Windows Explorer** window where you viewed the WebSphere Application Server log files earlier: **C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\logs\server1** folder.
- Notice that the log files (that were archived) are created with the current date and time.
- Open **SystemOut.log** with **Notepad++** and examine the log entries that are created during startup.
- Scroll down the log file to the text **P8 Content Platform Engine Startup: 5.5.2.0** as shown in the following screen capture.

You can also search for the text: P8 Content Platform Engine Startup

```
o [Perf Log] No interval found. Auditor disabled.
o -----
o P8 Content Platform Engine Startup: 5.5.2.0 dap552.1260 Copyright IBM Corp. 2003, 2018 All rights reserved
o -----
```

This text indicates the Content Platform Engine startup.

Errors are logged as Java stack traces. There are a couple of errors such as the following one:

"ResourceMgrIm E WSVR0017E: Error encountered binding the J2EE resource, CNMailSession, as mail/CNMailSession"

These errors can be ignored because the components are not being used. However, it is important that you monitor your organization's log files regularly and learn to recognize errors that might indicate a serious issue.

- Open **SystemErr.log** with **Notepad++** and then examine the log entries that are created during startup.  
Notice that this log file does not have as many entries as the SystemOut.log.
- Open **startServer.log** with **Notepad++** and examine the log entries.  
Notice the last entry that includes the text: *Server 1 open for e-business*.  
This log entry indicates that the WebSphere Application Server started successfully.
- When you are done examining the log files, click **File > Close All** and then exit **Notepad++**.
- Minimize the Windows Explorer windows.

# Activity: Configure trace logging

Trace logging options can be set on the domain or at the site level. If the settings are configured on the site, they override the settings on the domain.

In this activity, you configure trace logging on the Content Platform Engine at the domain level and site level. You log in to an IBM Content Navigator desktop to create security entries in the trace log and then examine the entries in the trace log.

In this activity, you will accomplish the following:

- View and configure initial trace configuration.
- Configure trace logging on the domain.
- Configure trace logging at the site level.
- Inspect the trace log files.
- Create trace log entries.
- Disable trace logging.

## Configure trace logging on the domain.

In this task, you will first view the trace log file before enabling the trace logging. You will configure trace logging at the domain level, and then configure the site to inherit these settings.

- Maximize the **Windows Explorer** window where you viewed the Content Platform Engine log files earlier: **C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\FileNet\server1**.
- Right-click the **p8\_server\_trace.log** file, select **Edit with Notepad++**, and examine the initial log entries.

Since the trace logging is not yet enabled, there may not be much text.

- Close the **p8\_server\_trace.log** file.
- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or enter the following URL: **http://vclassbase:9080/acce**
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the right pane, from the **EDU\_P8** tab, select the **Trace Subsystem** subtab. Use the forward arrow on the right to scroll to find the tab. You can also use the down arrow to select the subtab from the list.

If the contents of the tab is displayed, click the tab or click Refresh and the content will be refreshed.

- On the **Trace Subsystem** subtab, select the **Enable trace logging** option.
- For the **Log file location** field, select the **Use default** option.

The trace log is saved in the same folder as the Content Platform Engine log files.

Trace logging generates detailed diagnostic information about server and client activity. and select the subsystems to be logged.

Enable trace logging 

Log file location :  Use default   Other location: 

- Scroll down to the **Subsystems** section and select the **Detail** level trace options for the following subsystems:
  - Error Trace Flags**
  - Search Trace Flags**

Moderate and Summary levels are automatically selected.

Name	<input type="checkbox"/> Detail 	<input type="checkbox"/> Moderate 	<input type="checkbox"/> Summary 
Error Trace Flags	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Search Trace Flags	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Log files at the Detail level grow quickly. Enable only the subsystems that you need. Remember to disable trace logging when you no longer need it.

- Click **Save** to save the **EDU\_P8** domain configuration and then click **Refresh**.
- On the left navigation pane, expand the **Global Configuration > Administration > Sites** node and select **Initial Site (Default)**.
- From the **Initial Site** tab on the right pane, select the **Trace Subsystem** subtab and verify that **EDU\_P8 (server hierarchy object)** as the **Configuration source**.
- If it is not already selected, select the option, click **Save**, and then click **Refresh**. Ensure that Enable trace logging is selected.
- Log out of the administration console and close the browser.

- Maximize the **Windows Explorer** window where you viewed the Content Platform Engine log files earlier: **C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\FileNet\server1**.
- Open the **p8\_server\_trace.log** file in **Notepad++** and then verify that the file contains a few of **DEBUG** level entries at the end of the file.

The Debug value is on the Sev column of the log file.

If the entries are not listed, close the file, refresh on the Windows Explorer window and then open again.

```
2019-03-05T05:23:29.359 7BB6685F SRCH FNRCE0000D - DEBUG Search for: "SELECT * FROM CmSweep WITH
2019-03-05T05:23:29.374 B89708D5 SRCH FNRCE0000D - DEBUG Search for: "SELECT * FROM CmSweep WITH
2019-03-05T05:23:29.374 B6C44D59 SRCH FNRCE0000D - DEBUG Search for: "SELECT * FROM CmSweep WITH
2019-03-05T05:23:29.374 92B9B375 SRCH FNRCE0000D - DEBUG Search for: "SELECT * FROM CmSweep WITH
2019-03-05T05:23:29.374 7BB6685F SRCH FNRCE0000D - DEBUG Server query time = 5.378 milliseconds
```

- Close the trace log file and minimize the Notepad++ window.

## **Configure trace logging at the site level.**

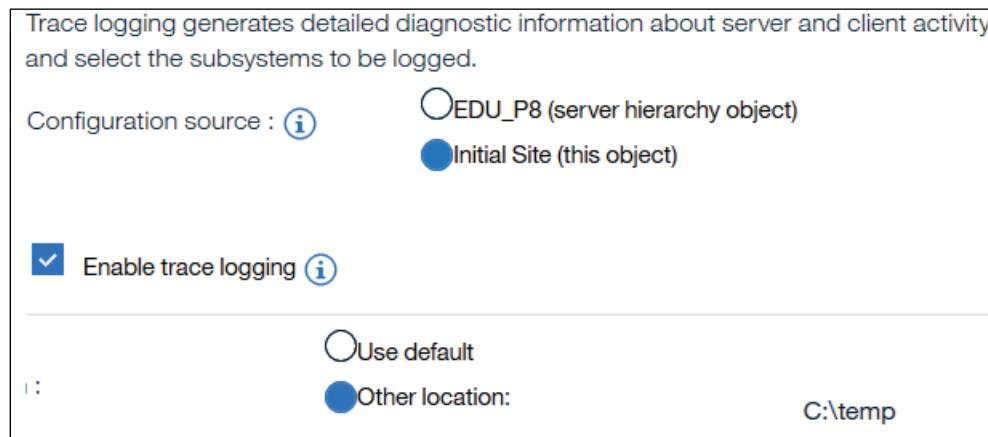
In the previous task, you enabled trace logging at the domain level. In this task, you configure the trace logging at the site level and it will override the domain settings.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- In the **ACCE**, on the left navigation pane, expand the **Global Configuration > Administration > Sites** folder and click **Initial Site (Default)**.
- From the **Initial Site** tab on the right, select the **Trace Subsystem** subtab and then select **Initial Site (this object)** for the **Configuration source** field.
- When you are prompted with a dialog box **Selecting this option means...**, click **OK** and then verify that **Enable trace logging** is selected.

The parent (domain) configuration values that apply to child objects will not apply to this node (site). Since the settings are configured on the site, it will override the settings on the domain, and so domain configurations values will not apply.

- For the **Log file location** field, select the **Other location** option and then type **C:\temp**.

The trace log will be saved to this new folder.



- Click **Save** and then click **Refresh**.
  - From the **Trace Subsystem** subtab, scroll down to the **Subsystems** section, select the **Detail** level trace options for the **Security trace flags** subsystem. If you are unable to select, log out of the administration console to clear the cache and log back in.
- The Error Trace Flags and Search Trace Flags entries are already selected because of the previous configuration. For the site level, you can modify them.
- Click **Save**, click **Refresh**, and then click **Close** to close the **Initial Site** tab.
  - Log out of the administration console and close the browser.
  - In **Windows Explorer**, navigate to the folder location (**C:\temp**) that you specified for the trace log and verify that the **p8\_server\_trace.log** file generated.
  - Refresh the display and then open the file in **Notepad++** and verify that the file contains **DEBUG** level entries.
  - Close the file.

## Create trace log entries.

You enabled security trace logging. You will log in to IBM Content Navigator as Olivia and then check the trace log file for this entry.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>.
- Type **Olivia** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.

- In **Windows Explorer**, navigate to the **C:\temp** folder and open the **p8\_server\_trace.log** file again in **Notepad++**.
- Search for the word **Olivia** and review the log entry.  
Some log entries show Olivia's login event.
- Close the trace log file and then exit **Notepad++**.
- Log out of the **IBM Content Navigator desktop** and close the browser.

## **Disable trace logging.**

Trace logging affects system performance and uses disk space. It is a good practice not to leave trace logging enabled for long periods of time.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the **EDU\_P8** tab, open the **Trace Subsystem** subtab.
- Clear the **Enable trace logging** option, click **Save**, and then click **Refresh**.  
Even if you configured trace logging at the Site level and those settings override any global (domain) settings, you still have to disable trace at the domain level.
- On the left navigation pane, expand the **Global Configuration > Administration > Sites** folder and click **Initial Site (Default)**.
- From the **Initial Site** tab on the right pane, select the **Trace Subsystem** subtab and then clear the **Enable trace logging** option.
- Click **Save**, and then click **Refresh**.
- Log out of the administration console and close the browser.  
Optionally, you can repeat the earlier *Create trace log entries* task with a different user (Oscar, FileNet1) and check the trace log file. You will not find any entries for Oscar since you disabled the trace logging.
- Close all the open Windows Explorer windows.

# Configure auditing

The Content Platform Engine, which is the main component of IBM FileNet P8 Platform, provides auditing capabilities for tracking additions, changes, and deletes to the object store content. In this section, you will learn how to configure auditing.

## What is auditing?

Auditing is the automatic logging of actions that are performed on a FileNet P8 object or a class.

- You can audit custom or system events that occur for objects so that you can track critical activities.
- Most events on FileNet P8 classes can be audited including the events for security, content management, and business transactions.
- The automatic logging of an event creates an audit entry in the audit log (in the database Event table).
- Audit entries can be programmatically created by custom applications.

For example, you can configure an audit definition for a document class to automatically log audit entries whenever documents of that class are checked in. Checking in a document is the initiating action that causes the CheckinEvent event to fire, which in turn causes an audit entry to be logged.

The following representation shows the sequence of cause and effect:

Initiating action (Checking in) => Event fired on source object (CheckinEvent) => audit entry created in the audit log

## Reasons for auditing

You configure auditing to gain information about objects:

- How often was this document accessed?
- When did this property value change?
- Which user made the change?
- Who deleted that document?

With auditing, you can record every time a document is opened, any changes to this document, and every time something was filed in a folder. You can also monitor if a user tries to open a document while lacking read access (denial of access).

## About Audit Definitions

An audit definition describes how to audit an event. It includes the event to audit and the following options:

- Record the modified post-event object and the original pre-event object in the audit record.
- Apply a filter expression to the source object of the event.  
The filter expression determines whether the event is audited. For example, a filter expression can test if a property on the source object is changed; if not, the event is not audited.
- Name an audit definition to associate it with a particular audit processing client or client function.
- Disable an audit definition.

For a complete list of auditable events, please refer to FileNet P8 Platform V5.5.x Knowledge Center:

[https://www.ibm.com/support/knowledgecenter/SSNW2F\\_5.5.0/com.ibm.p8.ce.admin.tasks.doc/p8pcc197.htm](https://www.ibm.com/support/knowledgecenter/SSNW2F_5.5.0/com.ibm.p8.ce.admin.tasks.doc/p8pcc197.htm)

## Audit entries

When an audit event occurs, audit entries are created in an audit log that is stored in the Event table of the object store database. Audit entries are instances of one of the subclasses of the Event class. For example, CheckinEvent is an Event subclass.

They can be searched for, viewed, and exported for reporting purposes.

Audit entries contain the following information or properties:

- Event, method, or action that occurred and any applicable parameters
- Name of the user who performed the action
- Date and time of the event
- Class and ID of the associated object
- Success or failure of the event
- Names of any changed properties, depending on the object state recording level
- Text of the query (for queries)
- Statement that the permissions were modified (for security updates)
- Ownership of the audit entry

## Audit history and audit log

You can view the audit entries for an object by viewing the object properties (audit history) or by querying the audit log.

You can query the audit log with an object store search. You search for objects that belong to the Event class and its subclasses (Example: object change event). You can enter criteria to further limit the search results returned.

## Pruning audit entries

Each event object that is created by auditing is stored as a row in the Event table in the object store database. You can delete audit entries that you no longer need by using manual or automatic pruning to control the size of audit log.

- The *audit subsystem* controls the pruning of audit events from the audit log. You can specify a schedule and configure parameters that control how the audit pruning process is run.
- An *audit disposition policy* specifies the criteria for identifying audit entries for disposition. You can define one or more audit disposition policies at the object store level.
- In *automatic pruning*, audit entries in the audit log are pruned in accordance with audit disposition policies.
- The audit entries for a deleted object are not automatically deleted from the audit log.
- In *manual pruning*, you can manage the size of the audit log by using a query to retrieve and delete audit entries.

If an audit disposition policy is enabled for an audit log, do not manage the size of the log manually.

## Audit processing bookmarks

When you manage audit logs with automatic pruning, your custom audit processing applications can partly control the pruning of audit events by setting bookmarks.

Bookmarks prevent the subsystem task from deleting those audit events that are still needed.

- A bookmark is a leave-off point in the audit log, which indicates the last record that is processed by the audit processing client.
- When an audit processing client ends a session, it sets its bookmark with an audit sequence number; when it later starts a new session, it retrieves its bookmark and resumes processing at the next audit sequence number.

- There can be multiple bookmarks, each reflecting a different audit processing client.
- The audit disposition subsystem does not delete any records that have audit sequence numbers greater than the lowest-valued bookmark, with the intention of deleting only audited events that were previously processed by clients.
- Applications can use the Content Engine API to set bookmarks.
- You can edit or delete audit disposition bookmarks by using the Administration Console for Content Platform Engine.

---

# Activity: Create audit definitions

---

In this activity, you enable auditing for an object store and create an audit definition to a custom document class. You update a document and then observe the audit history. You must be the administrator for the object store with full control access to configure items for auditing.

In this activity, you will accomplish the following:

- Enable auditing on the Sales object store.
- Create audit definitions.
- Create audit entries.
- View the audit history.
- Create more audit entries.
- Query the audit log.

## **Enable auditing on the Sales object store.**

You can enable and disable auditing at the object store level. Auditing is disabled by default.

- Ensure that the IBM FileNet P8 Platform components are started.  
If you have not started them earlier, start the components by using the earlier activity: *Prepare your system - Start IBM FileNet P8 Platform*.
- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and then click the **Sales** object store.

- On the **Sales** tab > **General** subtab, scroll down and then select **Yes** from the list for the **Enable auditing** field (third row from the bottom of the page).

Compress database tables and indexes : 	No
* Enable auditing :	
* Default checkout type : 	Exclusive
Advanced storage deletion delay : 	600

- Click **Save** and then click **Refresh**.

## Create audit definitions.

In this task, you create audit definitions on the Order document subclass. The Order class has two subclasses. These are custom classes that are created for this course on the student system.

- On the left pane for the **Sales** object store tab, navigate to **Data Design > Classes > Document** and select **Order**.
- From the **Order** tab on the right pane, select the **Audit Definitions** subtab.

Use the down arrow on the right to select the subtab from the list. You can also use the forward and backward arrows to scroll to find the subtab.

If the contents of the tab is not displayed, click *Refresh* or click the tab and the content will be refreshed.

- On the **Audit Definitions** subtab, click **New**.
- On the **New Audit Definition** page, type or select the following values for the fields listed below:
  - Display name: **Audit Updates**
  - Event: **Update Event**
  - Object state recording level: **Modified object only**
  - Audit type: **Success**
  - Apply to subclasses: **Selected**
  - Is Enabled: **Selected**

Leave the default for the other fields that are not mentioned here.

The completed page contains the values you entered:

New Audit Definition

Audit definitions represent information that describes how to audit an event. [Learn more...](#)

Display name : [i](#)

\* Event : [i](#)

\* Object state recording level : [i](#)

\* Audit type : [i](#)

Filter expression : [i](#)

Filter property name : [i](#)

Options : [i](#)

**Audit Updates**

Update Event [▼](#)

Modified object only [▼](#)

Success

Failure

Apply to subclasses

Is Enabled

**OK** **Cancel**

- Click **OK** to create the Audit Definition.
- Verify that your Audit Definition is listed on the **Audit Definitions** subtab of the **Order** tab and then click **Save** to save your work.
- Use the following values and repeat the steps to create another audit definition.
  - Display name: **Audit Deletions**
  - Event: **Deletion Event**
  - Object State Recording Level: **None**
  - Audit type: **Success**
  - Apply to subclasses: **Selected**
  - Is Enabled: **Selected**
- Click **Save** to save the changes to the **Order** class definition and then click **Refresh**.

Verify that your audit definitions are listed on the **Audit Definitions** subtab of the **Order** tab with the values that you selected.

<input type="checkbox"/>	Display Name	Event	Is Enabled	Apply To Subclasses	Success Audit Type	Failure Audit Type	Object State Recording
<input type="checkbox"/>	Audit Updates	Update Event	True	True	True	False	Modified object only
<input type="checkbox"/>	Audit Deletions	Deletion Event	True	True	True	False	None

- Log out of the administration console and close the browser.

## Create audit entries.

In this task, you create audit entries by updating values for properties of the Order document class.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.

The Content Navigator Desktop opens with the Browse view as indicated on the upper left of the page.

- From the upper right, click the down arrow next to **LoanProcess** and select **Sales** from the list.
- On the left pane, from the **Sales** object store, click the **Orders** folder.
- On the right pane, right-click a document (Example: **Order Basic A**), and then select **Properties**.
- In the **Properties** tab, change the value (Example: **100**) for the **Amount\_due** property and then click **Save**.
- Log out of IBM Content Navigator and then close the browser.

## View the audit history.

When auditing is enabled, you can view the audit history of an object to check which audited events took place. The audit log entries include when the change was made, and the user that made the change.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and then click the **Sales** object store.
- On the left pane of the **Sales** tab, expand **Browse > Root Folder** and then click **Orders**.
- Click the link to open the document that you changed in the previous task (Example: **Order Basic A**).
- From the **Order Basic A** tab, open the **Audit History** subtab.  
Use the down arrow on the right and select the tab name from the list.
- Click **Refresh** and then verify that there is at least one audit log entry.

Audit history					
Event	Date Created	Event Status	Creator	Id	
Update	February 2, 2019 at 8:32:57 AM GMT-05:00	Succeeded	p8admin	{8069AE68-0000-C92C-A9BC-78B5AC5A7C53}	

- To examine the information that is provided in the audit entry, click the **Update** link.
- From the **Update** tab, under the **General** subtab, examine the values in the fields.

Modified properties :	LastModifier = p8admin amount_due = 100.0 DateLastModified = February 2, 2019 at 8:32:57 AM GMT-05:00
-----------------------	---

The properties that you modified are shown.

- Click **Close** on the **Update** tab, log out of the administration console, and then close the browser.

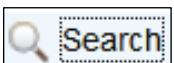
## Create more audit entries.

In this task, you use IBM Content Navigator to check out and download a document to save a local copy. Then you delete the same document from the object store.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- From the upper right, click the down arrow next to **LoanProcess** and select **Sales** from the list.
- On the left pane, from the **Sales** object store, click the **Orders** folder.
- On the right pane, right-click a document (Example: **PO 3411.tif**) and then select **Check Out > Check Out and Download**.
- In the **Opening ...** dialog box, select **Save File** and then click **OK**.  
The file is saved in the Downloads folder.
- Right-click the same document and select **Cancel Check Out**.
- Right-click the same document, select **Delete** and then confirm the Delete.
- Log out of the IBM Content Navigator desktop and then close the browser.

## Query the audit log.

In this task, you use the administration console Search page to find audit log entries.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and then click the **Sales** object store.
- On the left pane for the **Sales** object store tab, click the **Search**  icon.
- From the **Saved Searches** tab on the right pane, click **New Object Store Search** to create a new search.

- In the **New Object Store Search** tab > **Simple View** subtab, select the values for the following fields:
  - Class: Object Change Event**
  - Column A: Date Created**
  - Condition: Less than**
  - Value: Tomorrow's date and any time**

The Completed New Object Store Search contains the class and date that you entered.

Search: New Object Store Search

Simple View    SQL View    Bulk Actions (Disabled)

Construct or edit a query step-by-step by entering search criteria. You can optionally switch to the SQL View tab after you begin query construction here. You can also specify bulk actions to automatically apply to the query results, such as updating security.

Class : [Object Change Event](#)

Criteria [Object Change Event](#)

Property	Condition	Value
A Date Created	Less Than	2/3/2019 12:00 AM

You can also search for the *Event* parent class (instead of *Object Change Event*) which will return more results.

- Scroll down and in the **Search Result Display** section, select **Audit Sequence** for the **Order By** field.

Order by : [Audit Sequence](#)

Ascending     Descending

- Click **Run** on the toolbar to execute the search.

- In the **Search Results** tab, review the results and verify that there are two types of audit entries: **Update Event** and **Deletion Event**.

Actions	ID	Class Description	Audit Sequence
<input type="checkbox"/>	{8069AE68-0000-C92C-A9BC-78B5AC5A7C53}	Update Event	2
<input type="checkbox"/>	{507BAE68-0000-C96E-9522-6C2645CD6DFC}	Update Event	3
<input type="checkbox"/>	{207CAE68-0000-CC54-81B6-F82E4B880DEF}	Deletion Event	4
<input type="checkbox"/>	{507CAE68-0000-CC58-84D2-205BAA1E4248}	Deletion Event	5

- Click **Save As** on the toolbar to save the Search.
- In the **Save Query** window, type **Object Change Event Query** for the **Document Title** field, and click **OK**.  
Note that what name you provide is not critical.
- Click **Close** the new search tab and click **Yes** in the message window to save the changes.
- In the **Saved Searches** tab, click **Refresh**.  
Your saved search is listed and can be used for future use.
- Log out of the administration console and close the browser window.

# Activity: Prune audit entries

Audit logs can grow quickly and use up storage space. You can export the audit entries to a file (for example, XML) to cut down the storage space used. Then, you can prune the audit logs manually by using a search template, or automatically by using an audit disposition policy. In this activity, you create an audit disposition policy.

In this activity, you will accomplish the following:

- Create an audit disposition policy.
- Configure the audit subsystem.
- Verify that the audit logs are deleted.
- Configure an audit disposition schedule.
- Create some audit entries.
- Disable auditing on the Sales object store.

## Create an audit disposition policy.

In this task, you create an audit disposition policy that deletes audit entries that are older than 10 minutes.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: **http://vclassbase:9080/acce**
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and then click the **Sales** object store.
- On the left pane for the **Sales** object store tab, expand the **Administrative > Audit Disposition** node and then click **Audit Disposition Policies**.
- From the **Audit Disposition Policies** tab on the right pane, click **New**.
- Use the following data to complete the wizard and click **Next** to move to the next page of the wizard:
  - Name: **Prune Audit Logs**
  - Disposition rule: **DateCreated < Now () - TimeSpan(10, 'Minutes')**
  - Duration between completed sweeps: **300 seconds**
  - Enable audit disposition policy: **Selected**

Disposition rule includes an expression to identify the audited records to delete from the Event table and it must be a fragment of an SQL WHERE-clause expression. If the expression evaluates to true, the audited event is deleted.

With the value you provided, the audit disposition policy will delete the audit logs that are older than 10 minutes.

The screenshot shows a configuration interface for an audit disposition policy. At the top, there are tabs for Sales, Audit Dispo..., and New Audit D... (which is active). Below the tabs are buttons for < Back, Next >, Finish, and Cancel. The main area is titled "Set the Audit Disposition Policy parameters". It contains two sections: one for the Disposition rule and one for the Duration between completed sweeps. The Disposition rule section has a placeholder text: "DateCreated < Now () - TimeSpan(10, 'Minutes')". The Duration section shows a value of 300 seconds. A checked checkbox labeled "Enable audit disposition policy" is also present.

- On the **Summary** page, verify the values that you entered, click **Finish**, and then on the **Success** page, click **Close**.
- In the **Audit Disposition Policies** tab, click **Refresh**. Verify that your new audit disposition policy is listed.
- Close the **Audit Disposition Policies** and **Sales** tabs and leave the administration console open for the next task.

## Configure the audit subsystem.

The audit subsystem controls the pruning of the audit entries from the audit log. In this task, you enable the audit subsystem so that the auto disposition policy that you defined in the previous task can run.

- In ACCE, from the **EDU\_P8** tab, select the **Audit Subsystem** subtab on the right pane. Use the down arrow on the right to select the tab.
- Click **Refresh** if the content on the tab is not displayed.

- On the **Audit Subsystem** subtab, select the **Enable audit pruning** option.

The screenshot shows the 'Audit Subsystem' configuration page for the 'EDU\_P8' object store. At the top, there are 'Save' and 'Refresh' buttons. Below them, three tabs are visible: 'Cache Subsystem', 'Audit Subsystem' (which is underlined, indicating it is selected), and 'Content Subsystem'. Under the 'Audit Subsystem' tab, there is a button labeled 'Import Settings...'. A note below states: 'For this server hierarchy level and object, optimize the efficiency of the audit subsystem' with a link 'Learn more...'. At the bottom, there is a checkbox labeled 'Enable audit pruning' which is checked, with an information icon next to it.

- Click **Save** and then click **Refresh**.

## Verify that the audit logs are deleted.

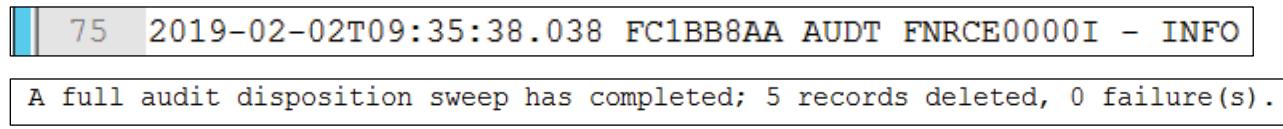
In the previous tasks, you enabled the audit subsystem and configured the audit disposition policy to delete audit logs that are older than 10 minutes. In this task, you verify that the audit entries are deleted from the audit log.

- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and then click the **Sales** object store.
- On the left pane for the **Sales** object store tab, click the **Search** icon.
- From the **Saved Searches** tab, click the **Object Change Event Query** link (the search that you saved earlier).
- In the **Object Change Event Query** tab, click **Run**.
- Verify that the search returns zero results this time.

The screenshot shows the 'Object Change Event Query' search results page. At the top, it displays 'Search: Object Change Event Query, Version: 1.0, Status: Released'. Below that is a 'Description' field with a long line of text. The main interface includes tabs for 'Simple View', 'SQL View', 'Bulk Actions (Disabled)', and 'Search Results' (which is underlined). An 'Actions' dropdown menu is also present. The search results area shows 'Search Result Count : 0' and the message 'Query returned no object'.

Recall that in the previous activity, the same search returned results. Since you deleted the audit entries by using an audit disposition policy, the search returns zero results.

- Close the **Object Change Event Query**, **Saved Searches**, and **Sales** tabs.
- In **Windows Explorer**, navigate to the folder that contains the Content Platform Engine server logs: **C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\FileNet\server1**
- Open the **p8\_server\_error.log** file in **Notepad++**, scroll to the end of the file, and then verify that a full audit disposition sweep was completed.



75 2019-02-02T09:35:38.038 FC1BB8AA AUDT FNRCE0000I - INFO  
A full audit disposition sweep has completed; 5 records deleted, 0 failure(s).

Note: A single line on the log file is shown in two screen captures.

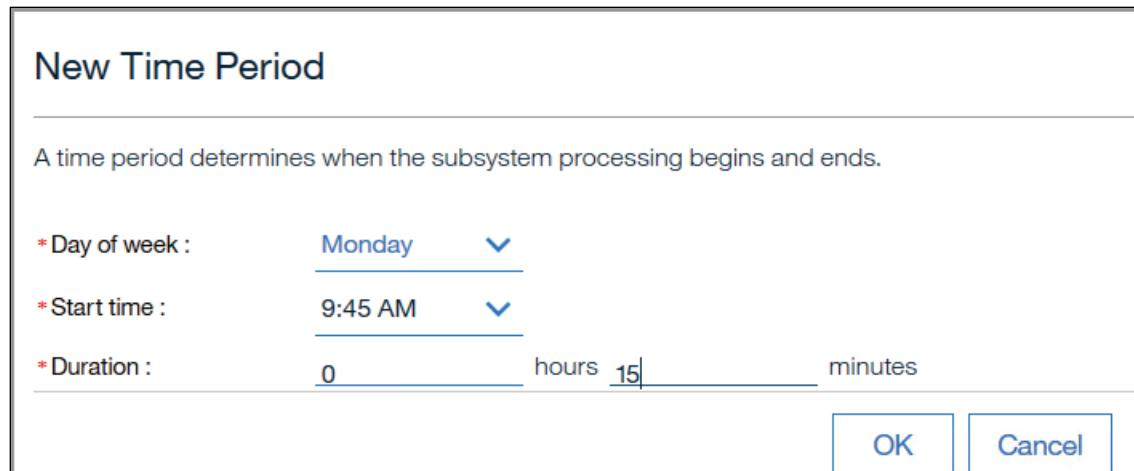
- Close the file, minimize the **Notepad++** and the **Windows Explorer** windows.

## Configure an audit disposition schedule.

In this task, you create a schedule for the audit subsystem so that the audit disposition policy runs every 5 minutes, one day a week.

- In the **ACCE**, from the **EDU\_P8** tab, select the **Audit Subsystem** subtab.
- On the **Audit Subsystem** subtab, scroll down to the **Schedule** area and click **New**.
- Use the following values for the fields to configure on the **New Time Period** dialog box:
  - Day of week: **Today's day of the week**
  - Start time: **Current system time plus 5 minutes**
  - Duration: **0 hours 15 minutes**

For the Start time field, select closest time slot that is listed, then edit the value.



**New Time Period**

A time period determines when the subsystem processing begins and ends.

* Day of week :	Monday
* Start time :	9:45 AM
* Duration :	0 hours 15 minutes

**OK**    **Cancel**

- Click **OK** on the dialog box and then click **Save** on the **EDU\_P8** tab.
- Log out of the administration console and close the browsers.

## Create some audit entries.

In this task, you use IBM Content Navigator to update property values for documents.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- From the upper right, click the down arrow next to **LoanProcess** and select **Sales** from the list.
- On the left pane, from the **Sales** object store, click the **Orders** folder.
- On the right pane, right-click a document (Example: **Order Basic A**) and then select **Properties**.
- On the **Properties** tab, change the value (Example: **150**) for the **Amount\_due** property and then click **Save**.
- Repeat the previous steps in this task to change the value for the **Amount\_due** property on a couple of the documents.

If any of the documents do not have a value for this property, type a value.

- Log out of IBM Content Navigator and close the browser.
- In **Windows Explorer**, navigate to the folder that contains the Content Platform Engine server logs: **C:\Program Files\IBM\WebSphere\AppServerprofiles\AppSrv01\FileNet\server1**
- Open the **p8\_server\_error.log** file in **Notepad++**, scroll to the end of the file, and then verify that there are a series of delay entries, one for each object store.

```
2019-02-02T09:59:01.978 9C2645FB ENG FNRCE0000I - INFO ScheduledPoolExecutor: AuditDisposition:  
2019-02-02T09:59:01.978 9C2645FB ENG FNRCE0000I - INFO ScheduledPoolExecutor: AuditDisposition:  
2019-02-02T09:59:01.978 9C2645FB ENG FNRCE0000I - INFO ScheduledPoolExecutor: AuditDisposition:  
2019-02-02T09:59:01.978 9C2645FB ENG FNRCE0000I - INFO ScheduledPoolExecutor: AuditDisposition:
```

```
AuditDisposition:LoanProcessQA serial=27 added to the delay queue true size of the delay queue 48  
AuditDisposition:SalesQA serial=47 added to the delay queue true size of the delay queue 48  
AuditDisposition:Sales serial=37 added to the delay queue true size of the delay queue 48  
AuditDisposition:LoanProcess serial=17 added to the delay queue true size of the delay queue 48
```

Lengthy lines on the log file are shown in two screen captures.

The Audit Disposition subsystem is delaying until the time that you scheduled as the start time. If the start time is reached, there will not be any delay queues, instead there will be an entry with a full audit disposition sweep that is completed.

- Check the **p8\_server\_error.log** again after **5 minutes** and then keep checking the log until after the **15-minute** duration time expires.
- In **Notepad++**, right-click the tab with file name and select reload to refresh the entries in the file.

Notice that after the duration time expires, there are no more entries that are logged for a full audit disposition sweep. The next audit disposition sweep will run one week from today, starting with the scheduled start time.

One of the entries should show a number of records that are deleted, corresponding to the number of documents that you updated.

```
ScheduledPoolExecutor: AuditDisposition:Sales serial=37 added to the delay queue
ScheduledPoolExecutor: AuditDisposition:SalesQA serial=47 added to the delay queue
A full audit disposition sweep has completed; 0 records deleted, 0 failure(s).
A full audit disposition sweep has completed; 0 records deleted, 0 failure(s).
A full audit disposition sweep has completed; 5 records deleted, 0 failure(s).
```

If the entries are not shown at the expected time, close the file and reopen.

- Close the **p8\_server\_error.log** file and then minimize the **Notepad++** window.

## **Disable auditing on the Sales object store.**

Since the audit logs can grow quickly and use up storage space, you will disable auditing for the object store that you enabled earlier.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and then click the **Sales** object store.
- On the **Sales** tab > **General** subtab, scroll down and select **No** from the list for the **Enable auditing** field (third row from the bottom of the page).
- Click **Save** and then click **Refresh**.
- Log out of the administration console and then close the browser window.

# Manage storage areas

## What is a storage area?

A storage area is a container where Content Platform Engine (CPE) stores content. CPE can be configured for file storage, fixed storage, database storage, or advanced storage. These storage options can be used individually or together.

When you create an object store, the wizard prompts you to specify the default content storage and the selection determines which content store serves as your default store when you add documents to the object store.

## Types of storage areas

- **Database storage area**

This is the database that is used for the object store. CPE stores both the objects and the content for those objects in the same database. Database storage areas are used for a smaller number and size of documents. For larger number of documents, other storage options are preferred.

- **File storage area**

This is a storage area that contains document content in a directory tree (a hierarchy of folders) on a local or shared network drive. The disk drive can be a Windows NTFS volume, a UNIX file system, or an IBM General Parallel File System (GPFS). You cannot create a file storage area on an encrypted NTFS volume.

Content Platform Engine server must have full access to the folders and the shared network drive that is used for storage.

A many-to-many relationship exists between CPE servers and file storage areas. Many servers can manage one file storage area and a single server can manage multiple file storage areas.

File storage area contains the following directory structure:

Base directory - It is the user-named parent directory for one or more file storage areas.

Root directory - It is the user-named top-level directory for a specific file storage area. Contains a stakefile which is a system file.

Content directory tree –The directories at the lowest level of the content directory tree store the committed content element files. The Storage Area wizard creates the tree.

- **Fixed storage area**

This file storage area is an external (non-FileNet P8) fixed content system that provides more storage and data retention. It consists of a file storage staging area on the FileNet P8 system and a separate content device.

- **Advanced storage areas**

An advanced storage area supports heterogeneous storage devices. OpenStack cloud storage and file system storage, as well as IBM Cloud Object Storage (ICOS). Amazon S3, and Dell Elastic Cloud Storage can be used as advanced storage areas. Advanced storage areas provide high availability content storage and disaster recovery through the use of replication and replica repair.

If you use advanced storage areas for your object stores, you need to choose a replication model that best suits your storage requirements. Replicas are storage area devices with identical content. Advanced storage areas are designed to be flexible enough to support a wide variety of replication models. An advanced storage area replicates synchronously to a designated number of storage devices in a designated priority order. You can set up both synchronous and asynchronous replication.

## **Support for S3 advanced storage devices**

The Content Platform Engine S3 connector provides the ability to store and retrieve documents to and from an S3-compatible object storage solution that is deployed either on premise or in a private or public cloud. The connector uses the CPE Advanced Storage Area interface that is specially designed for object and cloud connectivity.

You can use the connector with a number of devices, including:

- IBM Cloud Object Storage device
- Amazon Simple Storage Service (S3) storage device
- Dell Elastic Cloud Storage

CPE integrates with the S3 REST API and supports basic object operations such as adding, retrieving, and deleting objects in an S3 storage repository.

For more details on the supported storage solutions, review the Software Product Compatibility report for IBM FileNet Content Manager. The information is provided on the Hardware tab of the report. Reports can be generated here:

<http://www.ibm.com/software/reports/compatibility/clarity/index.html>

FileNet fix pack compatibility matrices are available here:

<http://www.ibm.com/support/docview.wss?rs=3278&uid=swg27014734>

## Storage area options

Content Platform Engine(CPE) offers the following options to store the content:

- **Encryption**

CPE encrypts and decrypts content by using AES in Counter mode, a Federal Information Processing Standard (FIPS) 140-compliant algorithm.

Encryption:

- protects the confidentiality of content that you add to a storage area.
- incurs a performance cost for content upload and retrieval.

The retrieval of encrypted content relies upon information that is stored in the object store database. If that information is lost, the content cannot be retrieved. To avoid such problems, regularly back up the object store database.

- **Duplication suppression**

The suppression of duplicate content potentially reduces the storage space that is required to store content. CPE checks the existing content before adding new content to the storage area. If identical content exists, the new content is not stored separately from the existing content.

Content duplication suppression:

- incurs a performance cost for uploading content.
- does not apply to fixed content storage areas.

- **Compression**

Content that is uploaded to a storage area is compressed if content compression is enabled and if the content can be compressed below the content compression threshold.

Content compression:

- reduces storage space that is required for content storage.
- can affect overall performance.

If both compression and encryption are enabled, compression is applied before encryption. Each compressed block is encrypted independently.

- **Content Caching options**

Content caching provides faster access to content across sites by temporarily storing remote content locally.

- To reduce network traffic, content can be cached on the file system that is local to the Content Platform Engine (CPE) server.
- A content cache area is an area that contains frequently accessed document content that is duplicated from the original content in storage areas.
- The following content caching options are available:
  - Not Allowed: Storage area content caching is disabled.
  - Cross-site Only: Caching of storage area content is available only when the storage area does not belong to the same site as the server that accesses the content.
  - Allowed: Storage area content can be cached to any cache area.

Note that if encryption is enabled, the content will be encrypted in the content cache as well as in the storage area.

- **Storage level hold for Hitachi devices**

Support has been added for implementing storage level holds on content stored on Hitachi HCL storage devices.

This is an aligned mode feature:

Both the CPE software and the Hitachi storage hardware set the storage hold. CPE controls the storage hold and determines when to set and clear the storage hold on the Hitachi storage device. When a storage hold is set, content cannot be deleted until the storage hold is removed.

The storage hold capability is enabled through the Administration Console for Content Platform Engine. When enabled, all new content that is stored on Hitachi storage has a hold placed on it. When the content is to be deleted, CPE removes the hold prior to deleting the content on Hitachi storage.

Storage level hold applies to content that is ingested after the capability is enabled. You cannot apply storage holds to existing content.

Storage level holds can be applied whether the Hitachi storage device is configured in aligned or unaligned mode.

## Resource statuses of File Storage Area

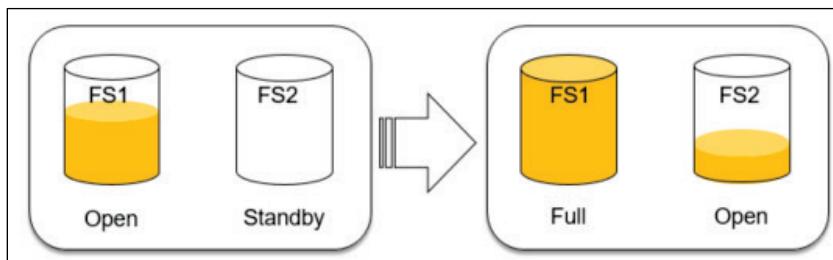
A resource status is a status associated with a storage area that determines, in combination with the storage area configuration, the permissible content operations for that storage area.

You can configure a storage area to disable the following content operations:

- Create content and Append content
- Delete content

Resource status changes occur in the following ways.

- **Automatically:** Content Platform Engine sets the resource status to Open for newly created storage areas, and also for storage areas with a status of Standby (in some circumstances). CPE changes the resource status from Open to some other status when detecting a particular storage area condition. For example, as shown in the following diagram, if FS1 reaches the maximum size and FS2 is on Standby, then FS1 switches from Open to Full, while FS2 switches from Standby to Open.



- **Indirectly:** You indirectly change the resource status when you set a storage area to be online or offline. For example, enabling the storage area to be online causes the resource status to be Open, and disabling the storage area causes the resource status to be Closed.
- **Directly:** You can directly change the resource status for a storage area.

## What is storage policy?

A storage policy provides mapping to specific physical storage areas and is used to specify where content is stored for a class or object with content (for example, a document). Each storage policy can have one or more storage areas as its assigned content storage target.

## Storage area farms

A storage area farm is a group of storage areas (a subset of the available storage areas) acting as a single logical target for content storage. Through this farming, Content Platform Engine provides load-balancing capabilities for content storage by transparently spreading the content elements across multiple storage areas.

The storage policy functions as both the mechanism for defining the membership of a storage area farm, and the means for assigning documents to that farm.

You can specify a single default content storage location for a document class. If you want to use storage farm capabilities, you need to use storage policies to manage the content delivery to the different storage areas.

For more information on storage management and best practices, refer to the article:

<https://www.ibm.com/developerworks/data/library/techarticle/dm-1003filenetstoragemanagement/index.html>

# Activity: Create a file storage area

In this activity, you create a file storage area, set it as the default storage area for the Document class, and then test it by adding a document.

In this activity, you will accomplish the following:

- Examine the default storage area.
- Examine an existing storage directory.
- Create a subdirectory for the file storage area.
- Create a file storage area.
- Verify the storage area directory structure.
- Set default storage for the content of Document class.
- Edit your storage area.
- Add a document to verify the configuration.

## Examine the default storage area.

In this task, you will add a document to an object store to check its default storage option for the Document class. You will also verify the default storage area statistics before and after adding a document.

- Ensure that the IBM FileNet P8 Platform components are started.  
If you have not started them earlier, start the components by using the earlier activity: *Prepare your system - Start IBM FileNet P8 Platform*.
- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and then click the **LoanProcessQA** object store.
- From the **LoanProcessQA** tab, on the left pane, expand to **LoanProcessQA > Administrative > Storage > Storage Areas** and then select **Default Database Storage Area**.
- From the **Default Database Storage Area** tab on the right pane, open the **Statistics** subtab and then click **Refresh**.

- Verify that the value for the **Total files** field is **0** (zero) and then close the tab.

The screenshot shows a software window titled "LoanProcess...". At the top, there are buttons for "Save", "Refresh", "Actions", and "Close". Below the title bar, it says "Database Storage Area: Default Database Storage Area". There are tabs for "General", "Properties", "Configuration", "Statistics" (which is selected), and "Storage Policies". Under the "Statistics" tab, there is a note: "Set parameters to define the capacity of the storage area. You can also view when the storage area is full." Two fields are shown: "Total files : 0" and "Total file size : 0".

- On the left pane, collapse the **Administrative** node and then expand **Browse**.
- Right-click **Root Folder** and then select **New Folder** to create a folder.
- From the **New Folder** tab on the right pane, type **Test** for the **Folder name** field and then click **Next**.
- Leave the defaults, click **Next** one more time, and then on the **Summary** page, click **Finish**.
- Click **Close** on the **Success** page and then click **Refresh** on the **LoanProcessQA** tab.
- On the left pane, expand **Browse > Root Folder**, right-click the **Test** folder, and click **New Document** to add a document.
- From the **New Document** tab on the right pane, type **TestDoc** for the **Document title** field, select the **With content** option, and then click **Next**.
- On the **Document Content Source** page, under the **Content Elements** section click **Add**.
- On the **Add Content Element** dialog box, click **Browse**.
- On the **File Upload** window, select a document (Example: **SampleDoc1.docx**) from the **C:\Training\F2810G\SampleDocs** folder and then click **Open**.
- On the **Add Content Element** dialog box, click **Add Content**.
- Click **Next** four more times (On the **Document Content Source**, **Object Properties**, **Document Content and Version**, **Specify Settings for Retaining Objects** pages).

- On the **Advanced Features** page, verify that **Default Database Storage Policy** is selected and then click **Next**.

The screenshot shows a software interface titled "LoanProcess...". At the top, there are tabs for "New Document..." and "Advanced Features". Below the tabs are buttons for "< Back", "Next >" (which is highlighted in blue), "Finish", and "Cancel". The main content area is titled "Advanced Features" and contains the instruction: "Specify additional options that you can assign to the document you are adding to the object store." Under this, there are two fields: "Storage area : [\(i\)](#)" and "Storage policy : [\(i\)](#)". To the right of the "Storage policy" field is a link "Default Database Storage Policy".

This default policy is associated with the default storage area. After you add this document, there will be a change in the total number of files for the default storage area.

You will work with Storage policy in the following activity.

- On the **Summary** page, click **Finish** and then click **Close** on the **Success** page.
- View the default storage area statistics again:
- On the left pane, navigate to **Administrative > Storage > Storage Areas** and click **Default Database Storage Area**.
- From the **Default Database Storage Area** tab on the right pane, open the **Statistics** subtab and click **Refresh**.
- Verify that the **Total files** field now has a value: **1 (one)**.

The screenshot shows a table titled "Database Storage Area: Default Database Storage Area". The table has tabs for "General", "Properties", "Configuration", "Statistics" (which is underlined to indicate it is active), and "Storage Policies". Below the tabs, there is a note: "Set parameters to define the capacity of the storage area. You can also view when the storage". Under the "Statistics" tab, there are two rows: "Total files : [\(i\)](#)" with the value "1" and "Total file size : [\(i\)](#)" with the value "0".

- Log out of the administration console and close the browser.

## Examine an existing storage directory.

In this task, you will view the existing file storage directories.

- In **Windows Explorer**, navigate to **C:\filenet**.

The student system uses this folder as the base directory for file storage.

- Open the **filenet** folder and observe that there are several folders: **BulkMoveFS**, **file\_stores**, **file\_stores2**, and **PurchaseOrderFS**.

These folders are the root directories for file storage on the student system.

You can use any string value for the base and root directory names. You can select any location in your local or distributed file system for the base directory. Content Platform Engine should have full access permission to these folders.

- Open the **file\_stores\content** folder and verify that there are **23** folders that are named **FN0** to **FN22**.

These directories store the committed content element files. The Storage Area wizard creates these content folders.

- Open the **FN0** (or any one of the 23 folders) folder and verify that each of them contains a set **23** folders that are named **FN0** to **FN22**.

- Open the **file\_stores\inbound** folder and verify that there are several folders.

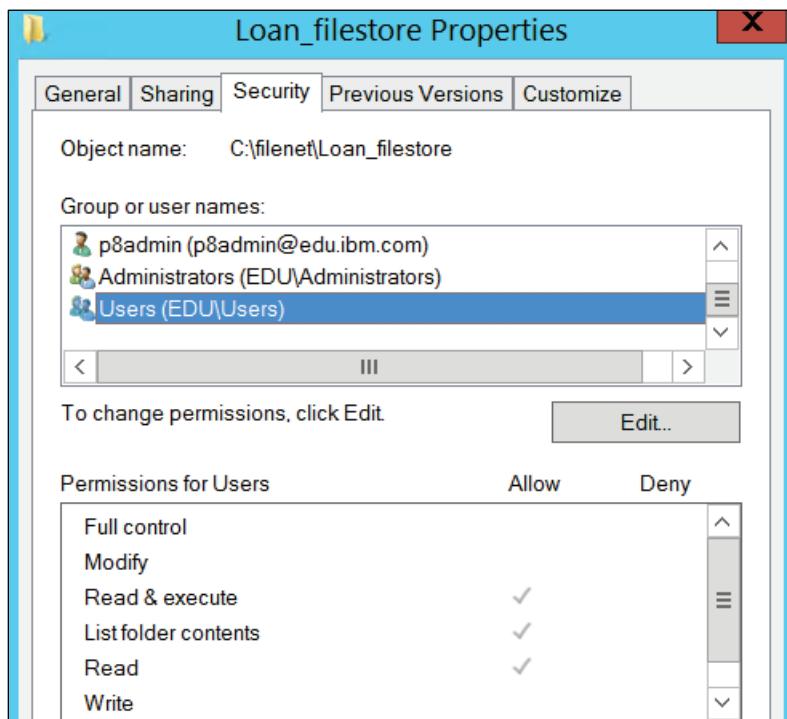
The inbound folder is the working area for uploading new content.

## Create a subdirectory for the file storage area.

In this task, you will create a subfolder to use it as a root directory for the new file storage area.

- In **Windows Explorer**, navigate to the **C:\filenet** folder and then create a folder with a name: **Loan\_filestore**
- Right-click the **Loan\_filestore** folder and select **Properties**.

- In the **Properties** window, click the **Security** tab and then verify that the permission for the non-admin users (Example: **EDU\Users**) is **read-only** to the folder.



Only the system admin user must be able delete and write files in the file store directories.

- Click **Cancel** and then close the **Windows Explorer**.

## Create a file storage area.

In this task, you will create a file storage area in Administration Console for Content Platform Engine (ACCE).

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane, expand the **Object Stores** folder and then click the **LoanProcessQA** object store.
- From the **LoanProcessQA** tab, on the left pane, expand to **LoanProcessQA > Administrative > Storage** and click **Storage Areas**.
- From the **Storage Areas** tab on the right pane, click **New**.
- On the **New Storage Area** tab, select **File** for the **Storage area type** field and click **Next**.

- Type **Loan Storage Area** for the **Display name** field, scroll down to verify that **Initial Site** is selected for the **Site** field, and then click **Next**.
- Configure the Storage Area with the following data:
  - Root directory: **C:\filenet\Loan\_filestore**  
This is the directory that you created in the previous task.
  - Directory structure size: **Small**  
Small structure will create two levels with a total of 529 directories. Similar to the one that you inspected in the earlier task.
  - Maximum number of elements: **Unlimited**
  - Maximum size: **Maximum allowed on device**
  - Delete method: **Destroy**
  - Encrypt content: **Disabled**
  - **Options:**
    - **Suppress duplicate content elements:** Cleared (Not selected)
    - **Compress content:** Selected

The completed page contains the values that you entered:

The screenshot shows the 'Configure the Storage Area' page. At the top, there are navigation buttons: '< Back', 'Next >', 'Finish', and 'Cancel'. The title 'Configure the Storage Area' is displayed. Below the title, there are several configuration fields:

- \* Root directory :** C:\filenet\Loan\_filestore
- Directory structure size :** Small
- \* Maximum number of elements :**
  - Unlimited
  - 25000
- \* Maximum size :**
  - Maximum allowed on device
  - 5000
- Deletion method :** Destroy
- \* Encryption method :** Disabled
- Options :**
  - Suppress duplicate content elements
  - Compress content
- Compression threshold (percentage) :** 80
- \* Standby activation priority :** 0

- For all other fields, leave the defaults and click **Next**.  
Click the information icon next to each field name to get more details about that field.
- For **Select a Storage Policy for this Storage Area**, leave the defaults (not selected) and click **Next**.  
You will create a storage policy in the next activity.
- Click **OK** to close the message about mapping the storage area to a storage policy.
- On the **Summary** page, review the details and click **Finish**.

- On the **Success** page, click **Close** to close the tab.
- On the **Storage Areas** tab, click **Refresh** and then verify that the **Loan Storage Area** is listed.
- Notice that **Loan Storage Area** has the **Type** that you assigned (**File Storage Area**) and the **Total Files** column has zero (**0**) as the value.

	Display Name	Type	Status	Total Files	Total File Size
	Default Database Storage Area	Database Storage Area	Open	1	11.1 KB
	Loan Storage Area	File Storage Area	Open	0	0.0 KB

- Log out of the administration console and close the browser.
- Close the **Storage Areas** tab and any other tabs that are not used.

## Verify the storage area directory structure.

- In **Windows Explorer**, navigate to the **C:\filenet\ Loan\_filestore** folder.
- Open the **Loan\_filestore** folder and observe the structure.  
Verify that *content* and *inbound* directories are created. The wizard also creates a folder that is called *system* and an *xml* file with the name: *fn\_stakefile.xml*
- Expand the **content** folder and verify that there are **23** folders that are named **FN0** to **FN22**.
- Open the **FN0** (or any one of the 23 folders) folder and verify that each of them contains a set of 23 folders that are named **FN0** to **FN22**.
- Open the **C:\filenet\ Loan\_filestore\inbound** folder and verify that there are several folders.
- Close **Windows Explorer**.

## Set default storage for the content of Document class.

In this task, you configure the new file storage area as the default storage container for the Document class.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and then click the **LoanProcessQA** object store.
- From the **LoanProcessQA** object store tab, expand **Data Design > Classes** on the left pane and click **Document**.
- From the **Document** tab > **General** subtab, scroll down and then for the **Default storage area** field, select **Loan Storage Area** from the list.
- Select **<None>** from the list for the **Default storage policy** field.

Default storage area : <a href="#">(i)</a>	<a href="#">Loan Storage Area</a>
Default storage policy : <a href="#">(i)</a>	<a href="#">&lt;None&gt;</a>

Ensure that **<None>** is selected for the Default storage policy. By selecting these values, you are removing the previous choice of Default Database Storage Policy. You will now be able to test your storage area.

- Click **Save** on the toolbar and then when prompted, click **Cancel** on the **Propagate Metadata Changes** dialog box.  
Depending on the configuration on this page, it affects the subclasses of the Document.
- Close the **Document** tab.
- Click **Refresh** on the **LoanProcessQA** object store tab.

## Edit your storage area.

This task demonstrates how you can edit an existing storage area. You will edit the Loan Storage Area that you created earlier to modify the properties and update the Statistics tab.

- From the **LoanProcessQA** tab, on the left pane, expand **Administrative > Storage > Storage Areas** and then click **Loan Storage Area**.

- From the **Loan Storage Area** tab on the right pane, click the **Configuration** subtab and then edit the following fields.
  - Content Caching: **Not Allowed**
  - Delete method: **Purge**

* Content caching :	Not allowed
* Deletion method :	Purge

- From the **Loan Storage Area** tab, open the **Statistics** subtab.
- In the **Storage Area Maximums** section, change **Maximum Size** to **10 MB**. Click the circle beside the field and change the value.

Maximum size :	<input type="radio"/> Maximum allowed on device
	<input checked="" type="radio"/> 10

- In the **Storage Policies** subtab, observe that the Storage Area is not yet mapped to any Storage Policies.  
You will create a policy in the next task.
- Click **Save** to save your changes to the storage area properties.
- Leave the **Loan Storage Area** tab open for the next task.
- From the **LoanProcessQA** tab, click **Refresh**.

## Add a document to verify the configuration.

In this task, you will verify that adding a document (of Document class) to the system adds the content to the new file storage area. You will also verify the default storage area statistics before and after adding a document.

The **Loan Storage Area** tab is opened from the previous task. If it is not open, open it by using the following step.

- From the **LoanProcessQA** tab, expand **Administrative > Storage > Storage Areas** and click **Loan Storage Area** tab.

- On the **Loan Storage Area** tab, click **Refresh**, open the **Statistics** subtab, and verify that there are zero files.

File Storage Area: Loan Storage Area

General	Properties	Configuration	<b>Statistics</b>	Storage Policies
Set parameters to define the capacity of the storage area. You can also view when the storage area is full.				
Total files :	(i)	0		
Total file size :	(i)	0		

- Expand **Browse > Root Folder**, right-click the **Test** folder, and then select **New Document**.
- From the **New Document** tab, type the name for the document: **Storage Area Test**
- Confirm that **Document** is selected for the **Class** field and the **With Content** option is selected.
- Click **Next** and then on the **Document Content Source** page, click **Add**.
- On the **Add Content Element** dialog box, click **Browse**.
- On the **File Upload** window, select a document (Example: **SampleTextDoc2.txt**) from the **C:\Training\F2810G\SampleDocs** folder and then click **Open**.
- On the **Add Content Element** dialog box, click **Add Content**.
- Click **Next** four more times (On the **Document Content Source**, **Object Properties**, **Document Content and Version**, **Specify Settings for Retaining Objects** pages).
- On the **Advanced Features** page, confirm that **Loan Storage Area** is selected and then click **Next**.
- On the **Summary** page, click **Finish** and then click **Close** on the **Success** page.
- On the left pane, click the **Test** folder under **Browse > Root Folder**.
- From the **Test** tab on the right pane, click **Refresh**, verify that your new document (**Storage Area Test**) is listed, and then click **Close**.
- On the **Loan Storage Area** tab, click **Refresh**, select the **Statistics** subtab, and then confirm that the Loan Storage area now contains one file.  
The value for the Total files field shows 1 (one).
- Log out of the administration console and close the browser.

# Activity: Create a storage policy

In this activity, you will create two file storage areas to represent a storage area farm. You will also create a storage policy that includes both of these storage areas and assign it to the Document class. The storage policy uses the load-balancing capabilities of the Content Platform Engine to distribute content within a storage area farm. You will then add some documents to the object store and observe the file count information in the storage areas.

In this activity, you will accomplish the following:

- Create storage area farms.
- Configure a new storage policy.
- Assign the storage policy to the Document class.
- Verify that storage area farming is working.

## Create storage area farms.

In this task, you create two subdirectories for storage area farms and then create two storage areas.

- In **Windows Explorer**, navigate to **C:\filenet** folder, create two folders with the following names: **FS\_Farm1** and **FS\_Farm2**, and close the Windows Explorer.
- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: **http://vclassbase:9080/acce**
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane, expand the **Object Stores** folder and then click the **LoanProcessQA** object store.
- From the **LoanProcessQA** tab, on the left tab, expand **Administrative > Storage**, and click the **Storage Areas** node.
- From the **Storage Areas** tab on the right pane, click **New**.
- On the **New Storage Area** tab, configure the Storage Area by using the following data:
  - Storage area type: **File**
  - Display name: **FS1**
  - Site: **Initial Site**

- Root directory: **C:\filenet\FS\_Farm1**
- Directory structure size: **Small**
- Maximum number of elements: **Unlimited**
- Maximum size: **20 MB**
- Delete method: **Clear**
- Encrypt content: **Disabled**
- Suppress duplicate content elements: **Cleared** (Not selected)
- Compress content: **Selected**

For the fields that are not listed here, leave the defaults.

For more step-by-step instructions, refer to the *Create a file storage area* task in the previous activity.

- In the **Storage Areas** tab, click **Refresh** and then verify that the **FS1** Storage Area is listed and it has **0** for the **Total Files** field.
- From the **LoanProcessQA** tab, click **Refresh**.
- Create a second File Storage area by repeating the above steps and by using the following values:
  - Storage area type: **File**
  - Display name: **FS2**
  - Site: **Initial Site**
  - Root directory: **C:\filenet\FS\_Farm2**
  - Directory structure size: **Small**
  - Maximum number of elements: **Unlimited**
  - Maximum size: **20 MB**
  - Delete method: **Clear**
  - Encrypt content: **Disabled**
  - Suppress duplicate content elements: **Cleared** (Not selected)
  - Compress content: **Selected**

For the fields that are not listed here, leave the defaults.

- In the **Storage Areas** tab, click **Refresh** and then verify that the **FS2** Storage Area is listed and it has **0** for the **Total Files**.

	Display Name	Type	Status	Total Files
	Default Database Storage Area	Database Storage Area	Open	1
	Loan Storage Area	File Storage Area	Open	1
	FS1	File Storage Area	Open	0
	FS2	File Storage Area	Open	0

- Close the **Storage Areas** tab and then from the **LoanProcessQA** tab, click **Refresh**.

## Configure a new storage policy.

In this task, you create a New Storage Policy and configure it.

- From the **LoanProcessQA** tab, expand **Administrative > Storage** and click **Storage Policies** on the left pane.
- From the **Storage Policies** tab on the right, click **New**.
- On the **New Storage Policy** tab, type **Farm Storage Policy** for the **Display name** field and then click **Next**.
- On the **Select the Content Storage Method** page, choose the **Select the storage Areas from a list** option and then click **Next**.
- For the **Storage areas** field, select **FS1** and **FS2** from the list and then click **Next**.
- On the **Summary** page, review the information, click **Finish**, and then click **Close** on the **Success** page.
- On the **Storage Policies** tab, click **Refresh** and then verify that your Storage Policy is listed.
- From the **LoanProcessQA** tab, click **Refresh**.

## Assign the storage policy to the Document class.

In this task, you will remove the previously assigned storage areas and configure the storage policy for the Document class.

- From the **LoanProcessQA** object store tab, expand **Data Design > Classes** on the left pane and then click **Document class**.

- From the **Document** tab on the right pane, under the **General** subtab, scroll down to the **Default storage policy** field and then select **Farm Storage Policy** from the list.
- Select **<None>** for the **Default storage area** field.

Default storage area : 	<b>&lt;None&gt;</b>
Default storage policy : 	<b>Farm Storage Policy</b>

Ensure that **<None>** is selected for the Default storage area. The Farm Storage policy specifies the FS1 and FS2 storage areas to save the content for the Document class.

If both the Default storage area and the Default storage policy are set, the Default storage area setting takes precedence and the storage policy that you defined is ignored.

- In the **Document** tab, click **Save**.
- When prompted, click **Cancel** on the **Propagate Metadata Changes** dialog box.
- In the **Document** tab, click **Refresh** and then click **Close** to close the Document tab.
- Log out of the administration console and close the browser.

## Verify that storage area farming is working.

To verify that the storage area farm functions, you will add some documents to the LoanProcessQA object store and then view the statistics of the FS1 and FS2 storage areas.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>.
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- From the upper right, click the down arrow next to **LoanProcess** and select **LoanProcessQA** from the list.
- On the left pane, click the **Test** folder under the **LoanProcessQA** object store.
- In **Windows Explorer**, navigate to **C:\Training\F2810G\SampleDocs**, select and drag all the files (but not the subfolders), and drop them to the IBM Content Navigator **Test** folder.

In Content Navigator desktop, the Add Documents page opens.

- In **Content Navigator** desktop, click **Add** to add all the files and wait for the upload to complete.
- Verify that the documents are listed in the **Test** folder and then log out of **Content Navigator** desktop and close the browser.
- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane, expand the **Object Stores** folder and then click the **LoanProcessQA** object store.
- From the **LoanProcessQA** tab, on the left pane, expand **Administrative > Storage**, and then click the **Storage Areas** node.
- In the **Storage Areas** tab, confirm that **FS1** and **FS2** have some documents.

Your storage policy used the load-balancing capabilities of the Content Platform Engine to distribute content within the storage area farm. The documents were added to both the file storage areas in the storage area farm.

	Display Name	Type	Status	Total Files	Total File Size
○	Default Database Storage Area	Database Storage Area	Open	1	11.1 KB
○	Loan Storage Area	File Storage Area	Open	1	0.1 KB
○	FS1	File Storage Area	Open	7	892.8 KB
○	FS2	File Storage Area	Open	3	201.0 KB

The screen capture that is shown here is a sample. Depending on the number of documents that you added and how they were load-balanced, you might get different numbers for FS1 and FS2.

- Log out of the administration console and close the browser.

# Activity: Create an advanced storage area

In this activity, you will create an advanced file storage area with two replication devices: ASFD1 and ASFD2. You want to make ASFD1 the primary synchronous device, and ASFD2 the secondary synchronous device. You will then add them to the Farm storage policy.

In this activity, you will accomplish the following:

- Create Advanced Storage Devices.
- Create an Advanced Storage Area.
- Configure the storage devices.
- Edit the storage policy.
- Test the advanced storage area.

## Create Advanced Storage Devices.

You must create an advanced storage device before you can use an advanced storage area.

- In **Windows Explorer**, navigate to **C:\filenet** folder, create two folders with the following names: **ADVS1** and **ADVS2**, and close the Windows Explorer.
- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: **http://vclassbase:9080/acce**
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane, expand the **Object Stores** folder and then click the **LoanProcessQA** object store.
- From the **LoanProcessQA** tab, on the left tab, expand **Administrative > Storage > Advanced Storage > Advanced Storage Devices** and click **File System Storage Devices**.
- From the **File System Storage Devices** tab on the right pane, click **New**.
- On the **New File System Storage Device** tab, type **AFSD1** for the **Display name** field and then click **Next**.
- On the **Configure the File System Device** page, type **C:\filenet\ADVS1** for the **Root directory path** field and then click **Next**.
- On the **Summary** page, verify the details, click **Finish**, and then click **Close** on the **Success** page.

- On the **File System Storage Devices** tab, click **Refresh** and then verify that **AFSD1** is listed.
- From the **LoanProcessQA** tab, click **Refresh**.
- Create another File System Storage Device by repeating the above steps and by using the following values.
  - Display name: **AFSD2**
  - Root directory path: **C:\filenet\ADVS2**
- On the **File System Storage Devices** tab, click **Refresh**, verify that **AFSD2** is listed, and then close the tab.

	Display Name	Descriptive Text	Root Directory Path
	AFSD1	AFSD1	C:\filenet\ADVS1
	AFSD2	AFSD2	C:\filenet\ADVS2

- From the **LoanProcessQA** tab, click **Refresh**.

## Create an Advanced Storage Area.

In this task, you will create an advanced storage area by using the two advanced storage devices that you created.

- From the **LoanProcessQA** tab, on the left pane, expand the **Administrative > Storage > Advanced Storage node** and then click **Advanced Storage Areas**.
- From the **Advanced Storage Areas** tab, on the right pane, click **New**.
- On the **New Advanced Storage Area** tab, type **ADV\_SA** for the **Display name** field, verify that **Initial Site** is selected for the **Site** field, and then click **Next**.
- On the **Configure the Advanced Storage Area** page, select **AES Counter Mode with 128-bit key** for the **Encryption method** field and then select the **Compress content** option.

* Encryption method :	AES Counter Mode with 128-bit key
Options :	<input type="checkbox"/> Suppress duplicate content elements <input checked="" type="checkbox"/> Compress content

- Click **Next** and then on the **Associate a Storage Device with this Advanced Storage Area** page, type **2** for the **Required synchronous devices** field.

- For the **Available storage replication devices** field, select the two devices that you created: **AFSD1**, **AFSD2** and then click **Next**.  
The number of required synchronous devices must be greater than zero and equal to or less than the number of available storage replication devices.
- On the **Advanced Storage Area Parameters** page, select **Validate on creation**, verify that **Auto repair on content validation** is already selected, and then click **Next**.
- On the **Select Storage Policies** page, select **Farm Storage Policy** and then click **Next**.
- In the **Summary** page, review the details and click **Finish**.
- In the **Success** page, click **Close** to close the tab.
- In the **Advanced Storage Areas** tab, click **Refresh** and verify that the **ADV\_SA** is listed.

## Configure the storage devices.

In this task, you will change one of the storage devices to be the primary synchronous device. The storage device settings are configured with the defaults. You can change these settings on the Devices tab of the advanced storage area.

- In the **Advanced Storage Areas** tab, click the advanced storage area that you created (**ADV\_SA**).
- In the **ADV\_SA** tab, open the **Devices** subtab.
- Scroll down, for the **AFSD1** row, select **Primary synchronous** from the list, and then verify that the **AFSD2** row has the value: **Secondary synchronous**.

Device Replica Name	Device Replica Site	Device Replica Type	Deletion Method Supported	Default Synch Type
<input type="checkbox"/> AFSD1	Initial Site	File System Storage Device	Purge	Primary synchronous ▾
<input type="checkbox"/> AFSD2	Initial Site	File System Storage Device	Purge	Secondary synchronous ▾

- Click **Save** and then click **Close**.

## Edit the storage policy.

The Farm Storage Policy has three storage areas that are associated with it. You associated 2 of them when you created the storage area farms and the third one for the advanced storage area. You will remove the first two file storage areas to test the third one.

- From the **LoanProcessQA** tab, on the left pane, expand the **Administrative > Storage > Storage Policies** node and then click **Farm Storage Policy**.
- From the **Farm Storage Policy** tab on the right pane, scroll down, under the **Associated Storage Areas** section, select **FS1** and **FS2**, and then click **Remove**.
- Click **Save** to save the changes.
- Log out of the administration console and close the browser.

## Test the advanced storage area.

In this task, you will verify that adding a document (of Document class) to the system adds the content to the new file storage area.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>.
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- From the upper right, click the down arrow next to **LoanProcess** and select **LoanProcessQA** from the list.
- On the left pane, click the **Test** folder under the **LoanProcessQA** object store.
- In **Windows Explorer**, navigate to **C:\Training\F2810G\SampleDocs**, select and drag all the files (not the subfolders), and drop them to the IBM Content Navigator **Test** folder.

In the Sample Desktop, the Add Documents page opens.

- In **Content Navigator** desktop, click **Add** to add all the files and wait for the upload to complete.
- Verify that the documents are listed in the **Test** folder and then log out of ICN **Sample Desktop** and close the browser.
- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.

- On the left pane, expand the **Object Stores** folder and then click the **LoanProcessQA** object store.
- From the **LoanProcessQA** tab, on the left pane, expand **Administrative > Storage > Advanced Storage** node, and then click **Advanced Storage Areas**.
- From the **Advanced Storage Areas** tab, on the right pane, verify that **ADV\_SA** has some documents.

Display Name	Status	Total Files	Total File Size	Delete Method	Synchronous Replicas Required
ADV_SA	Open	10	1.7 MB	Clear	2

The Total Files column shows the number of documents that you added. The number depends on the number of documents that you added.

- Log out of the administration console and close the browser.

# Build an object store

In this section, you learn how to create the JDBC data sources, create an object store by using the data source, and add the object store to an IBM Content Navigator desktop.

## What is an Object Store?

An object store is a repository for storing, managing, and accessing metadata and objects. Examples of objects are documents, folders, and class descriptions.

System administrators typically use the IBM Administration Console for Content Platform Engine tool to create object stores and configure them.

Users access the object store through their client applications for tasks like creating, searching, retrieving, and storing documents. IBM Content Navigator is the primary web interface for business users to work with content. You can also build custom applications.

## Object metadata and content storage

Object metadata is stored in a database. The document content can be stored in a database or in storage areas.

An object store can have one database store, and zero or more storage areas.

A storage area is a container where Content Platform Engine (CPE) stores content. CPE can be configured for database storage, file storage, fixed storage, or advanced storage. These storage options can be used individually or together.

## Object store databases

Object stores can share a database and a database connection, but they must use separate unique schema names.

A database administrator creates the databases that meets the documented requirements. For example, for IBM Db2 for Linux, UNIX, and Windows server, the following requirements are required:

- Use SERVER authentication
- Set the DB2 code set to UTF-8
- Set the page size to 32 KB

Refer to the IBM FileNet P8 Platform V5.5.x Knowledge Center for the requirements of the following databases:

- Microsoft SQL
- Oracle
- DB2 for z/OS
- DB2 for Linux, UNIX, and Windows server

## **Global Configuration Database (GCD)**

The GCD contains attribute definitions that control functional characteristics of the resources and services for the FileNet P8 domain.

The GCD provides bootstrapping data and global configuration information for the FileNet P8 domain.

The GCD also defines domain resources, such as sites (and their related virtual servers and server instances), full-text index areas, fixed content storage areas, marking sets, and other data.

## **Database connection objects**

A database connection object identifies the data source pair that provides the Java Database Connectivity (JDBC) to a database (or for Oracle, tablespace). The JDBC data source information is used by Content Platform Engine (CPE) to connect to global configuration database (GCD) and object store databases.

Use the IBM FileNet Configuration Manager (CMUI) tool to create the data sources that are required for a database connection object. Then use Administration Console for Content Platform Engine to create a database connection object for an object store to access the database.

The Database Connection object uses the XA and non-XA data source connections to connect to the object store database.

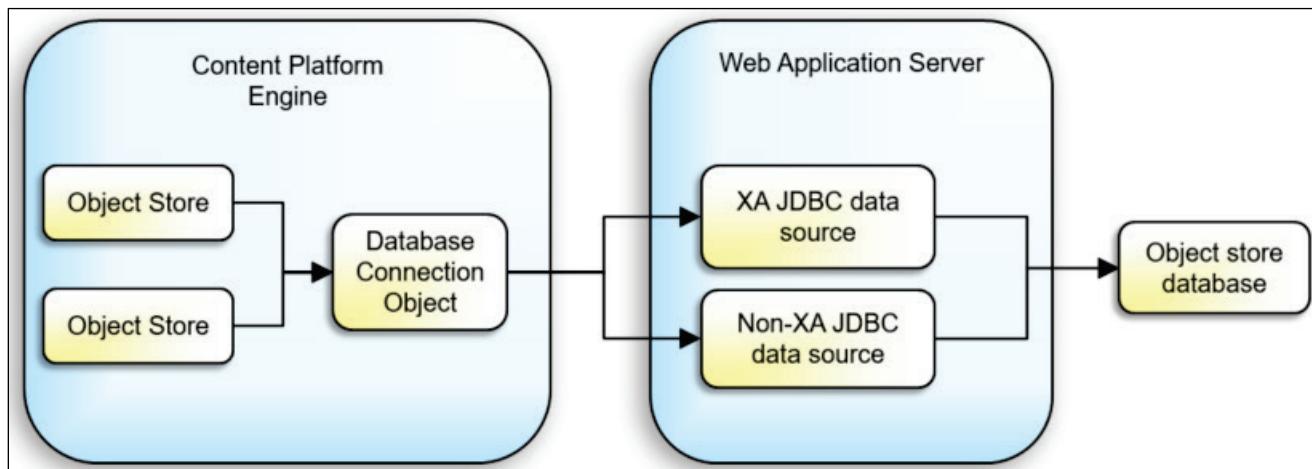
- XA is an industry-wide standard for transactions that involve multiple resources. Content Platform Engine uses the XA data sources for all create, update, and delete operations because of their rollback and timeout features.
- Non-XA transactions have no transaction coordinator. Content Platform Engine uses non-XA data sources for search and retrieve operations because these operations do not modify data, so rollback features are not needed.

## Object store and database connectivity

The content of an object in an object store can be stored in a database or in a storage area. However, the metadata for the object is always stored in the database. An object store must have a database connection for it to function.

The following diagram describes the flow of object store and database connectivity:

- Object stores connect to a database through a database connection object.
- A database connection object has both XA and non-XA data sources defined in a web application server.



# Activity: Create JDBC data sources for an object store

If a database connection already exists, you can use it to create the object store immediately. Otherwise, you must first create the data sources and a database connection object that are required for the Content Platform Engine to access the database.

A database and a data source already exist on the student system that was used to create the existing object stores. Typically, you will use the existing data source and database. For this activity, you will create a new data source to practice the skills. A database called MARK\_DB is already created on your student system.

In this activity, you will accomplish the following:

- Open the FileNet Configuration Manager and the profile.
- Configure data sources for an object store.
- Verify the data sources.

## Open the IBM FileNet Configuration Manager and the profile.

- Ensure that the IBM FileNet P8 Platform components are started.  
If you have not started them earlier, start the components by using the earlier activity: *Prepare your system - Start IBM FileNet P8 Platform*.
- From the Windows desktop, right-click the **FileNet Configuration Manager** icon and select **Run as administrator** from the list.
- Click **Yes** when you are prompted to allow the program to make changes.  
You can also access this tool from Programs > IBM FileNet P8 Platform > FileNet Configuration Manager.  
If the Welcome page is presented when you open the tool, click the X icon on the Welcome tab to close the page.
- In the **IBM FileNet Configuration Manager for Content Platform Engine** window, click **File > Open Profile**.
- In the **Open** window, navigate to the **C:\IBM\FileNetP8\config\F2810G\_EDU\_CPE\_profile** folder, select the **F2810G\_EDU\_CPE\_profile.cfgp** file, and then click **Open**.

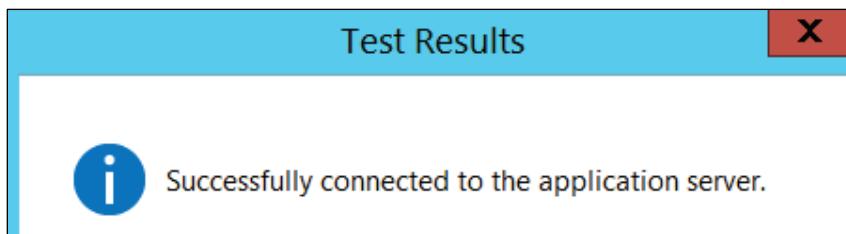
As part of installation and configuration of the Content Platform Engine, a profile file is created. When you need to make updates to the environment, you can create a copy of the initial configuration file to create a new profile file and then update it.

For your convenience, a copy of the profile file (F2810G\_EDU\_CPE\_profile.cfgp) is already created on the student system.

- When prompted with the **Verify your application server settings before proceeding** message window, click **OK**.
- Right-click **F2810G\_EDU\_CPE\_profile** on the left pane and then select **Edit Application Server Properties** from the list.

The Properties page opens.

- Verify that the **Application server version** field has **9.0** as the value and the **Application server administrator user name** field has **wasadmin** as the value.
- Type **FileNet1** in the **Application server administrator password** field and also in the **Confirm** field.
- Click **Test Connection**.



Test Results shows the message that the connection to the server is successful.

- Click **OK** to close the **Test Results** message window and then click **Finish**.

## **Configure data sources for an object store.**

In this task, you will create the data sources for the Content Platform Engine to access the database. A database called MARK\_DB is already created on your student system.

- Right-click the **Configure Object Store JDBC Data Sources** task and then select **Copy Selected Task** from the list.
- A copy of the task with a name beginning with the string **Copy\_of\_** is listed in the left pane.
- Right-click the **Copy\_of\_Configure Object Store JDBC Data Sources** task and click **Rename Task** from the list.
  - In the **Rename Task** window, change the name to **Configure Marketing OS JDBC Data Sources** and then click **OK**.

- In the left pane, double-click the renamed task and edit the configuration properties page for the task with the following data.
  - JDBC driver name: **DB2 Universal JDBC Driver**
  - JDBC Data Source name: **MOSDS**
  - JDBC XA Data Source name: **MOSDSXA**
  - Database server name: **vclassbase**
  - Database port number: **50000**
  - Database name: **MARK\_DB**
  - Database user name: **db2admin**
  - Database password: **Education1**
  - Confirm (for the password): **Education1**

Leave the default settings for any values that are not specified in the list.

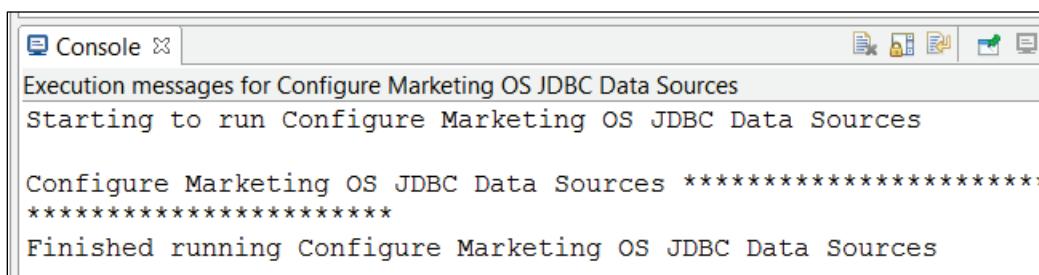
- Click **Save**, scroll down and click **Test Database Connection**.
- If you are prompted, click **Yes** on the **Action Required** window to save the task before proceeding.

A Test Results window is shown with the message that the connection to the database is successful.

- Click **OK** to close the **Test Results** message window and then click **Run Task** to create and configure the data sources.

Monitor the status on the Console pane on the lower right of the window.

Wait until the *Finished running Configure Marketing OS JDBC Data Sources* message is shown on the **Console** tab.



```
Execution messages for Configure Marketing OS JDBC Data Sources
Starting to run Configure Marketing OS JDBC Data Sources
Configure Marketing OS JDBC Data Sources ****
*****
Finished running Configure Marketing OS JDBC Data Sources
```

- From the menu bar, click **File > Close Profile** and then click **File > Exit** to close the FileNet Configuration Manager.

## Verify the data sources.

The activities in this course refer to the Integrated Solutions Console for WebSphere Application Server as the WebSphere Application Server administrative console.

- In the **Mozilla Firefox** browser, click the **WAS** bookmark or enter the following URL: <https://vclassbase:9043/ibm/console/logon.jsp>
- Type **wasadmin** for the **User ID** field, **FileNet1** for the **Password** field, and then click **Log in**.

The Welcome page for the WebSphere Application Server administrative console opens.

- On the left pane, expand the **Resources > JDBC** node and then click the **Data Sources** link.
- From the **Data Sources** pane on the right, scroll down, and then verify that **MOSDS** and **MOSDSXA** are listed.

<input type="checkbox"/>	<a href="#">MOSDS</a>	MOSDS	Cell=EDUCell01	DB2 IBM JCC JDBC provider for DB2	CEMP DataSource
<input type="checkbox"/>	<a href="#">MOSDSXA</a>	MOSDSXA	Cell=EDUCell01	DB2 IBM JCC JDBC provider for DB2 (XA)	CEMP DataSource (XA)

You will restart the Content Platform Engine (**server1**) in the following steps to refresh the server for the new data sources that you created.

- On the left pane, expand the **Servers** node and click the **All servers** link.
- From the **Middleware servers** pane on the right, select the checkbox on the **Select** column for the **server1** row and then click **Stop** from the toolbar.

Wait for the **server1** to stop and the status column to show a red X icon. You can refresh the Status column by clicking the Refresh icon next to Status.

- From the right pane, select the checkbox again on the **Select** column for the **server1** row and then click **Start** from the toolbar.

Wait for the **server1** to start and the status column to show a green forward arrow icon. You can refresh the Status column by clicking the Refresh icon next to Status.

- Log out of the **WebSphere Application Server** administrative console and close the browser.

# Activity: Create an object store

In this activity, you will accomplish the following:

- Create a Database Connection Object.
- Create an object store
- Verify the new object store

## Create a Database Connection Object.

In this task, you create a Database Connection Object in the administration console.

You use the Data Source values that you created in the previous activity.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane, expand the **EDU\_P8 > Global Configuration > Administration** node and then click **Database Connections**.
- From the **Database Connections** tab on the right pane, click **New**.  
The New Database Connection tab opens.
- Type **MOSDS** as the value for the **Display name** field, leave the default value (**Initial Site**) for the **Site** field and then click **Next**.
- Type **MOSDS** for the **JNDI data source** field.

* JNDI data source :	MOSDS
* JNDI XA data source :	MOSDSXA

- If it is not automatically populated, type **MOSDSXA** for the **JNDI XA Data Source** field and then click **Next**.
- In the **Summary** page, view the details, click **Finish**.
- Wait for the process to complete and then on the **Success** page, click **Close**.
- In the **Database Connections** tab, click **Refresh**, verify that the new **MOSDS** connection is listed and then close the tab.

Troubleshooting tip: if all the steps were done correctly but the task fails, it is most likely due to the data sources (created in the previous activity) were not refreshed.

Restart the student system to refresh the Web Application Server components and repeat this activity.

Leave the administration console open for the next activity.

## Create an object store.

In this task, you create an object store in ACCE.

- On the left pane of the **EDU\_P8** tab, click the **Object Stores** node.
- From the **Object Stores** tab on the right pane, click **New**.
- On the **New Object Store** tab, type **Marketing** as the value for the **Display name** field and then click **Next**.

The Symbolic name and the Description fields are automatically populated with the same name.

The symbolic name, which is used for internal programmatic purposes, must contain only ASCII characters and must begin with an alphabetic character.

- Select **MOSDS** from the list for the **Database connection** field, type **Marketing** for the **Schema name** field, and then click **Next**.

Since, the same database can be shared for two or more object stores, each object store must contain a schema name that is unique for that object store.

Leave the default values (no value) for the other fields.

- On the **Select the Type of Storage Area for Content** page, click **Next**.  
If you select a storage area other than Database, two storage areas get created because an object store always has a database storage area. You can select a different storage area type for your object store after it is created.
- On the **Grant Administrative Access** page, click **Add User/Group Permission**.
- On the **Add Users and Groups** page, for the **Search for** field, clear the **Users** and **Special accounts** options (checkboxes), and leave **Groups** selected.
- Type **P8** in the field that is next to the **Search by** field and then click **Search**.
- In the **Search Results** section, from the **Available Users and Groups** pane, select and move **p8admins** to the **Selected Users and Groups** pane.  
Use the forward arrow.
- Scroll down and then click **OK** to close this page.
- Verify that this group is listed on the **Grant Administrative Access** page, and then click **Next**.

It is a good practice to always use groups rather than individual users. Using Security groups simplifies modifying access rights after the object store is created.

- On the **Grant Basic Access** page, click **Add User/Group Permission**, add the **p8users** group, and then click **Next**.

If you don't specify any users and leave an empty list, the wizard automatically adds #AUTENTICATED-USER, which gives all network users in the authentication realm access to the object store. If you know that only specific user groups need access, then specify those groups instead of the #authenticated-users.

- On the **Select Add-ons** page, click **Default Application Configuration** and verify that the following add-ons are selected.

- 5.2.1 Base Application Extensions
- 5.2.1 Base Content Engine Extensions
- 5.2.1 Process Engine Extensions
- 5.2.1 Publishing Extensions
- 5.2.1 Stored Search Extensions
- 5.2.1 Workplace Access Role Extensions
- 5.2.1 Workplace Base Extensions
- 5.2.1 Workplace E-mail Extensions
- 5.2.1 Workplace Forms Extensions
- 5.2.1 Workplace Template Extensions
- 5.2.1 Workplace XT Extensions

Although FileNet Workplace XT is no longer used, the add-ons are still required for some of the features in IBM Content Navigator.

Select only the add-ons that you need to avoid performance issues. If you need other add-ons later, you can always install them after the object store is created. But once you install an add-on, it cannot be removed.

- Click **Next**, on the **Summary** page, review your selections, and then click **Finish** to create the object store.

It can take a while before the progress bar changes and the new object store to be created.

If a message states that the script is unresponsive, click **OK** to continue.

- In the **Success** page, click **Close**.  
Notice all the add-ons you selected were installed.

## Verify the new object store.

In this task, you create a test folder in the new object store to verify that the object store is working.

- In the administration console, from the **Object Stores** tab, click **Refresh**.  
Verify that the new object store is listed.
- Click the **Marketing** link.
- On the **Marketing** tab > **Properties** subtab, verify the **Database Connection** property has **MOSDS** as the value.  
It indicates that the Marketing object store uses the new MOSDS data connection.
- From the left pane, expand **Marketing** > **Browse**, right-click **Root Folder** and then click **New Folder** from the list.
- In the **New Folder** tab, type **Test Folder** in the **Folder name** field and verify that the **Class** field has **Folder** as the value.
- Click **Next** and on the **Specify Settings for Retaining Objects** page, leave the defaults, and click **Next**.
- On the **Summary** page, click **Finish** and then on the **Success** page, click **Close**.
- On the **Marketing** tab, click **Refresh**.
- On the left pane, expand **Marketing** > **Browse** > **Root Folder** and then verify that **Test Folder** is listed.  
If the new folder is added, you successfully created the object store.
- Log out of the administration console and close the browser.

---

# Activity: Add the repository to an IBM Content Navigator desktop

---

The object store that you created can currently be accessed only through the Administration Console. To make it accessible to the Marketing team and other users to manage the content, you must configure the object store as a repository in IBM Content Navigator (ICN). Then, you must associate this repository with an ICN desktop to enable users to access the content.

In this activity, you will accomplish the following:

- Configure your repository.
- Edit the desktop to add your repository.
- Test the Sample Desktop.

## Configure your repository.

In this task, you configure your object store in the ICN administration desktop.

- In the **Mozilla Firefox** browser, click the **ICN Admin** bookmark or enter the following URL: <http://vclassbase:9081/navigator/?desktop=admin>  
The URL value is case-sensitive.
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.  
This account has administrative rights.
- In the ICN administration page, click  in the left pane.  
On the Repositories tab, a list of the repositories that are already configured is shown.
- To create a connection to your repository, click **New Repository** and then select **FileNet Content Manager** from the list.
- Type the following values:
  - Display Name: **Marketing**
  - Server URL: **iiop://vclassbase:2809/FileNet/Engine**
  - Object store symbolic name: **Marketing**
  - Object store display name: **Marketing**

The ID field is automatically populated. Notice that EJB is selected for the Protocol field.

- Scroll down, click **Connect** to test the connection to the repository, and then on the **Log In** page, type the following credentials of an administrative user of the repository:
  - User: **P8admin**
  - Password: **FileNet1**
- Click **Log In**.  
Notice that other tabs for this new repository is now available.
- Save the configuration settings for the new repository by clicking **Save and Close**.
- On the **Repositories** tab, click **Refresh**, and then verify that the new repository is listed.  
This repository is now available to be used in the IBM Content Navigator.
- Close the **Repositories** tab.

## **Edit the desktop to add your repository.**

In this task, you associate your repository with an ICN desktop so that it is available in that desktop.

- In the Admin desktop page, from the **Desktops** tab, right-click the **Sample** desktop and click **Edit**.
- On the **Sample** tab, click the **Repositories** subtab.
- From the **Repositories** subtab, select **Marketing** repository from the **Available Repositories** pane and use the forward arrow (Add) to move it to the **Selected Repositories** pane.
- On the **Sample** tab, select the **Layout** subtab, scroll down, and select **Browse** under the **Displayed features** section.
- Verify that your repository (**Marketing**) is listed on the right-most pane under the **Repository Name** section.

This setting enables the desktop users (with the appropriate permissions) to browse the folders and documents in the repository.

- On the **Sample** tab, click **Save and Close**.
- When you are prompted that you must refresh your browser, click **Close**.
- Log out of the ICN admin desktop.

## Test the Sample desktop.

In this task, you will open the Sample desktop and verify that you are able to access your repository.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.

The ICN Sample Desktop opens.

Notice that the default feature opened is **Browse**, as indicated in the upper left and the default repository opened is **LoanProcess**.

- Click the down arrow next to **LoanProcess** on the upper right and select your repository (**Marketing**) from the list.
- Click **New Folder** from the toolbar.
- In the **New Folder** page, type **ProposalFolder** for the **Folder Name** field. Leave the default for all the other fields. Observe the Folder class and security that is assigned to this folder.
- Click **Add** from the lower right of the page.
- Back on the **Browse** page, double-click **ProposalFolder** to open the folder and then click **Add Document** from the toolbar.
- In the **Add Document** page, type **SampleDoc** for the **Document Title** field.
- For the **What do you want to save?** field, click **Browse**.
- On the **File Upload** page, select any file (Example: **MarketingPlan1.pdf**) from the **C:\Training\F2810G\SampleDocs** folder and then click **Open**.
- Back on the **Add Document** page, leave the default for all the other fields and observe the Document class and security that is assigned to this document.
- Scroll down and then click **Add**.
- Back on the **Browse** page, verify that the new document is listed.
- Double-click the document to open it in the Viewer, verify the document content is shown, and then close the Viewer.
- Click the **head and shoulder icon** in the banner, select **Log Out** to log out of ICN **Sample Desktop** and then close the browser.

# Create property templates and classes

In this section, you learn how to create choice lists and different types of property templates. You will also create custom document and folder classes by using the property templates.

## What is a Class?

A class is a model or template that is used to create objects.

The class to which an object belongs determines the object's methods, properties, and default security. The Class Description property identifies the class of an object.

Each Content Platform Engine (CPE) object is instantiated from a CPE class, which is a specification for a set of objects that have the same supported methods and properties.

Examples of CPE classes are Document, Custom Object, Folder classes.

You can create subclasses for many CPE classes and each subclass can have its own set of custom properties in addition to the properties provided by its superclass.

## System default classes

When an object store is created, it is pre-populated with a set of system-created classes. They serve different functions.

- You can extend the system classes by defining subclasses.
- The most commonly extended system class is the Document class.
- You create application-specific documents by defining Document subclasses.

Examples of system default classes:

- The annotation class allows the user to link additional information to documents and other containable objects such as folders, and custom objects. Examples of annotations are text, audio, video, image, highlight, and sticky notes.
- The custom object class has no built-in behavior but has properties that pertain to a business subject. Define business object classes when you do not need to save content or use lifecycles or versions.
- The document class defines the properties of a document and is created to organize documents by type. The subclasses of the Document class is the most commonly used.
- The folder class holds a collection of objects.
- The subscription identifies an action that should occur when a specific event occurs on a specified object.

## What are Document objects?

A Document object is an instance of the Document class or subclass.

- Documents can have the following elements:
  - Content elements
  - Associated annotations
  - Custom metadata or properties that are used for identification
- Document content elements can be stored locally, inside an object store or in an external repository and referenced from the object store.
- A Document object can be updated.
  - Each version of the document is assigned a version number.
- A Document object can be searched.

## Folder objects

A Folder represents a container that holds containable objects such as the following ones:

- Child folders or subfolders
- Documents
- Workflow definitions
- Custom objects

A Folder is independently securable and it can be searched.

Each object store has an automatically created root folder that represents the default root container that is associated with the object store. You cannot create or delete a root folder, but you can access it.

Folders that are directly contained under the root folder are referred to as top folders. These folders typically represent the starting points for folder navigation, because, for many applications, you might not want to display or allow users to add objects to the root folder.

A folder structure is useful to browse to documents via tools such as IBM Content Navigator. For a large volumes of content, other alternative is to store all content as unfiled and then use searches to find the documents of interest. The unfiled documents are not stored in any folders and they can be viewed in the administration console under Unfiled documents node.

## Containment Concepts

Subfolders are directly contained and they exist inside a parent folder. They are deleted from the object store when they are removed from the parent folder.

Documents and other objects are referentially contained in folders.

- You can add a document to any number of folders.
- Adding a document to many folders does not duplicate the document.
- Removing a document from a folder does not delete the document from the object store.

## Class Inheritance and custom classes

Class inheritance is a relationship between classes. One class inherits the structure and behavior that is defined in its superclasses.

When you create an object store, the system automatically creates class definitions for all of the system-provided classes. You can create a custom class by creating a subclass of an original class definition, and adding custom properties to the subclass that reflect your business needs. Subclasses inherit properties from their super class.

The Document class is the superclass of other document subclasses that you create. It defines the behavior of a document and contains important system properties such as Content Element, Version, and Date created. You cannot remove a property from a subclass that was inherited from its superclass.

## What is a Property?

A property is a characteristic of a class. It helps identify the object that the class includes. Properties hold individual values that describe an object. Properties of a class can be of different types.

## Property templates

A property template is a collection of metadata properties that globally define a property. It has no function in the object store until it is assigned to a class as a custom property. You can assign it to any number of classes in an object store. Its symbolic name must be unique within a class family.

Definition of a property includes the following metadata:

- Data type: Scalar or object-valued
- Cardinality: Single or multivalue
- Settability: Read-only, read/write

- Name: name property indicator
- Choice List assignment indicator

## Short or long custom string properties

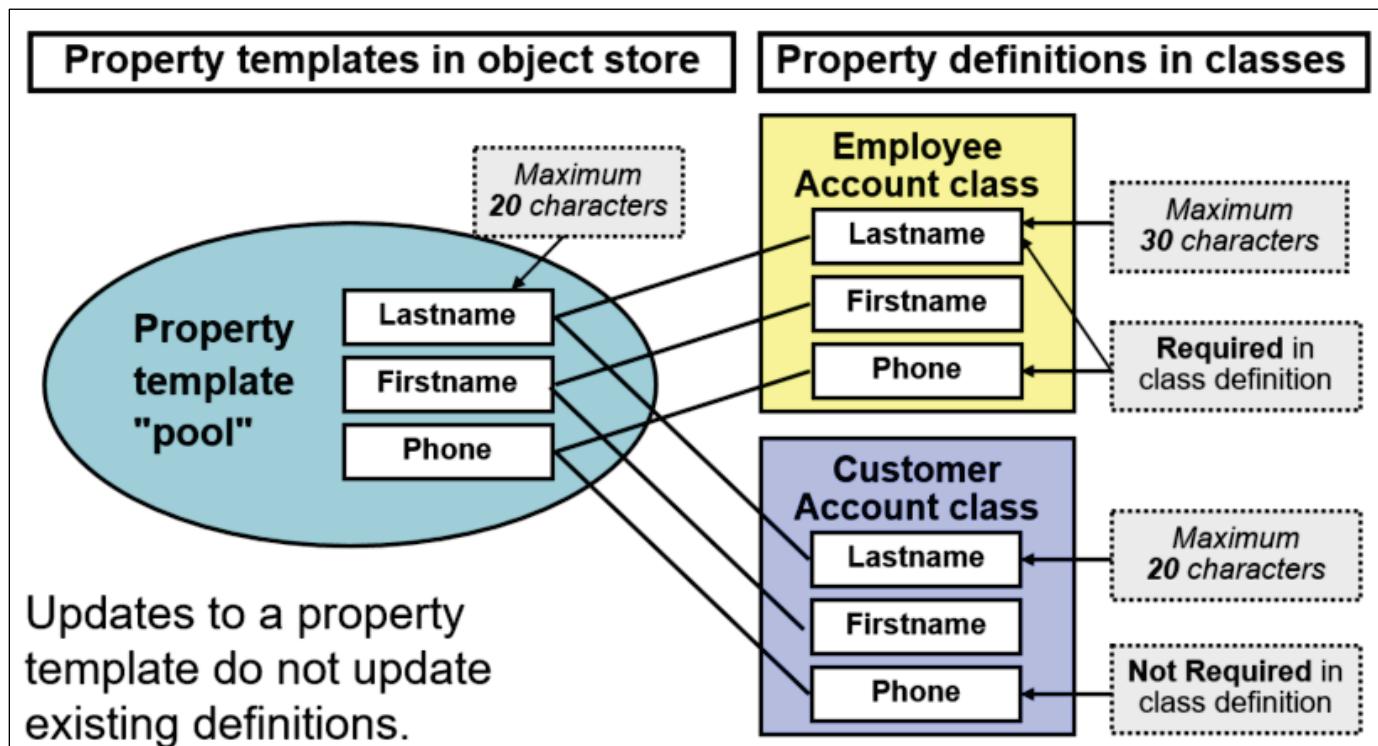
You can define a custom string property to be stored in either a short or long database column. Besides the maximum lengths permitted, there are differences exist between short and long strings such as how they are queried.

For more details on this topic, refer to the IBM FileNet P8 Platform V5.5.x Knowledge Center:

[https://www.ibm.com/support/knowledgecenter/SSNW2F\\_5.5.0/com.ibm.p8.ce.admin.tasks.doc/properties/pr\\_select\\_property\\_descriptions.htm](https://www.ibm.com/support/knowledgecenter/SSNW2F_5.5.0/com.ibm.p8.ce.admin.tasks.doc/properties/pr_select_property_descriptions.htm)

## What are Property Definitions?

Property definitions are based on property templates. When you are creating a class, you assign property templates to the class, which creates property definitions for that class. You can modify the attributes of the property definitions to support the class requirements. Multiple classes can use a property template and each resulting property definition is specific to the class.



The above diagram shows the available pool of property templates and their possible relationships to the property definitions in classes.

The distinction between property templates and definitions is subtle but important.

If you change a property definition of a class, then only that class is updated. When you create classes, you select the property template from the object store pool where the property template remains in its original state.

## Choice lists

A choice list is a collection of predefined property values (choice items) that can be used to present values in logical groups. The users then select a value instead of typing an entry. Choice lists make data entry faster for users and also ensure that the data entered is limited to the valid choice options.

Requirements for a choice list:

- Assign a choice list to a property template to make a choice list available
- Use either a string or an integer data type for a choice list
- Ensure that each choice item within a choice list has the same data type
- Match the choice list data type to that of its associated property template

Usage options:

- You can assign one choice list to multiple property templates.
- You cannot delete the choice list object as long as it is associated with a property template.
- If the database used by CPE is case-sensitive, the display names of the choice values in the choice lists are also case-sensitive.

Groups in choice lists

When a choice list contains many values, you can group associated values (create categories) to help users find the needed value.

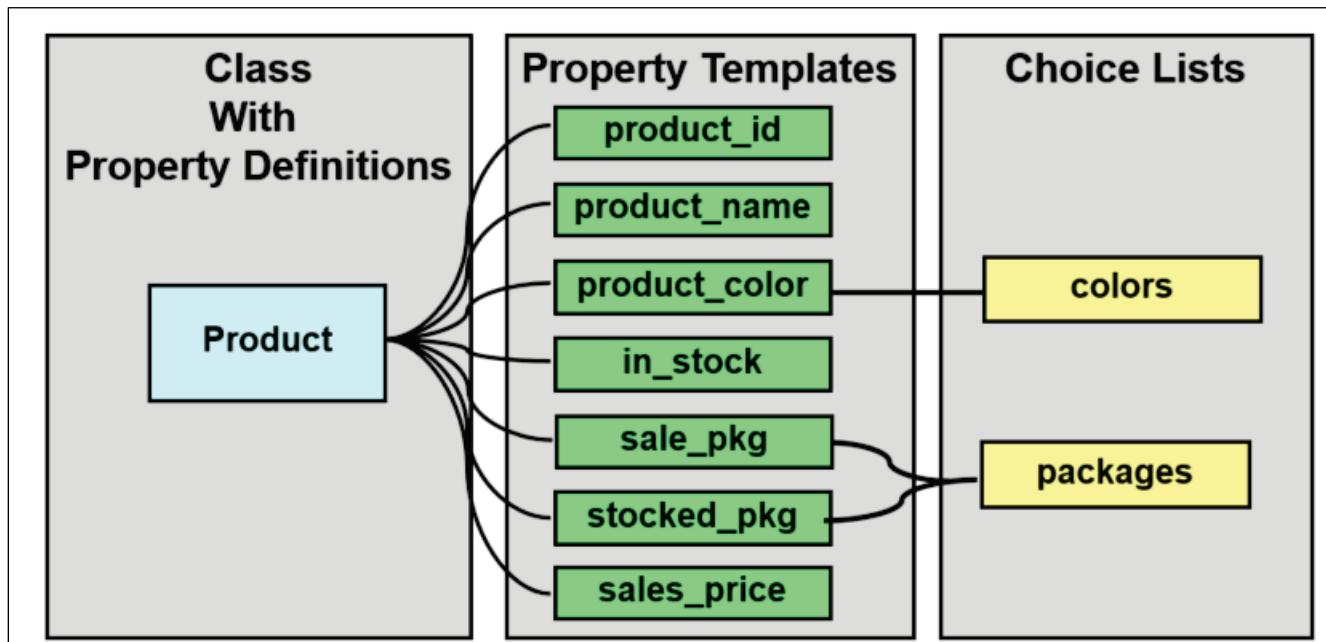
Choice lists can be hierarchical. A choice item can act as a group node and hold a choice list, allowing you to organize related choice values into nested groups. Thus a choice item can represent four types of values: a single integer value, a single string value, a group node for a list of integer-type choice items, and a group node for a list of string-type choice items.

In a hierarchical choice list, users select a category of choices and then select the choice within that category or group.

## How are Classes, Properties, and Choice Lists Related?

You use Administration Console for Content Platform Engine to create and administer classes, properties, and choice lists.

The following diagram shows the relationships between classes, properties, and choice lists.



- Each class has multiple property definitions (that are based on property templates)
  - A class consists of its root class properties and more custom properties.
  - A property has a name and data type.
- A property template can optionally have an associated choice list.
  - A choice list is a set of predefined values.
- A choice list can be associated with multiple property templates.
  - For example, many properties can use a single choice list with color choice items.

# Activity: Create a choice list

Choice lists help save time and prevent errors during data entry. Choice lists constrain property values to a pre-defined set values. In this activity, you create a choice list that you can later use in a property template.

In this activity, you will accomplish the following:

- Create a choice list.
- Verify the new choice list.

## Create a choice list.

- Ensure that the IBM FileNet P8 Platform components are started.  
If you have not started them earlier, start the components by using the earlier activity: *Prepare your system - Start IBM FileNet P8 Platform*.
- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **SalesQA** object store.
- From the **SalesQA** tab, expand the **SalesQA > Data Design** node on the left pane and click **Choice Lists**.
- From the **Choice Lists** tab on the right pane, click **New**.  
The New Choice List tab opens.
- On the **New Choice List** tab, enter **Prospect Type** for the **Display name** field and then click **Next**.
- Select **String** for the **Choice list data type** field and then click **Next**.
- To add choice list items, click **New Items**.
- On the **New Items** page, type **Reseller** for the **Display name** field.  
When you click outside the Display Name field, the value is automatically populated for the Value field. Optionally, you can edit the value field.  
Make sure that the Value field is populated before you click Add.
- Click **Add**.  
The choice item is added to the pane.

- Repeat the steps to add another item with the name: **End user**
- Verify that both the items are listed on the pane.

	Name	Value
<input type="checkbox"/>	Reseller	Reseller
<input checked="" type="checkbox"/>	End user	End user

- Scroll down and then click **OK** to close the **New Item** window.
- Back on the **New Choice List** tab, click **New Groups** to add a group to the choice list.
- On the **New Groups** page, type **Dealer** in the **Display name** field and then click **Add**.

The group name is added to the pane.

Groups are not actual choice list items because they do not have a value property that is assigned to them. The groups are useful to organize items within a choice list. The groups can also be hierarchical.

- Click **OK**.
- Select **Dealer** and then click **New Items** to add choice items to the **Dealer** group.
- On the **New Items** page, add the following items.

Display Name and Value are given as pairs.

- Motorcycle, Motorcycle
- Trailer, Trailer
- Vehicle, Vehicle
- Click **OK**.

- Back on the **New Choice List** tab, verify that your completed choice list includes a group with vehicle choice items.

**Add Choice List Items**

You can add new items to the choice list and optionally group the items.

```

    graph TD
      PT[Prospect Type] --> Reseller[Reseller(Reseller)]
      PT --> EndUser[End user(End user)]
      Dealer[Dealer] --> Motorcycle[Motorcycle(Motorcycle)]
      Dealer --> Trailer[Trailer(Trailer)]
      Dealer --> Vehicle[Vehicle(Vehicle)]
  
```

The screenshot shows a hierarchical list of choice items under 'Prospect Type'. The 'Dealer' node is selected and highlighted with a blue background. To the right of the list is a vertical context menu with four options: 'New Items', 'New Groups', 'Edit', and 'Remove'. The 'Edit' option is highlighted with a blue background.

You can edit the choice items. To edit, select the item and click **Edit**.

You can also rearrange the choice items. To rearrange, click the item and use the **Move Up** or **Move Down** buttons.

- Click **Next**, and then from the **Summary** page, click **Finish**.
- On the **Success** page, click **Close**.

## Verify the new choice list.

- On the **Choice Lists** tab, click **Refresh**, verify that **Prospect Type** is shown, and then click the **Prospect Type** link.
- On the **Prospect Type** tab, click the **Choice Items** subtab and then verify that the choice items that you defined are listed.
- Close the **Prospect Type** and **Choice Lists** tabs.
- Log out of the administration console and then close the browser.

# Activity: Create property templates

In this activity, you create several property templates for the SalesQA object store in Administration Console for Content Platform Engine. You associate the choice list (that you created) with a property template. You will use these property templates in Folder and Document class definitions later.

In this activity, you will accomplish the following:

- Create a String property template.
- Create a Multi-valued property template.
- Create a Value-required property template.
- Create a property template with a Choice List.
- Create a Date Time Type property template.
- Create an Integer type property template.

## Create a String property template.

In this task, you will create your first property template.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **SalesQA** object store.
- From the **SalesQA** tab, expand the **SalesQA > Data Design** node on the left pane and click **Property Templates**.
- From the **Property Templates** tab on the right pane, click **New**.
- On the **New Property Template** tab, enter **sales\_prospect\_name** for the **Display name** field.  
Click outside of the Display name field.
- Verify that the **Symbolic name** and **Description** fields are automatically populated.
- Optionally, edit the value for **Description** and then click **Next**.  
It is useful to provide a name prefix for property templates to track the property templates that are created for a specific application.

- Select **String** from the list for the **Data type** field and then click **Next**.
- For the **Select Choice List or Marking Set** page, leave the defaults (nothing selected) and then click **Next**.
- Select the **Single** option for the **Single or Multi-Value** field, and then click **Next**.
- On the **Summary** page, view the details and click **Finish**.
- On the **Success** page, click **Close**.
- On the **Property Templates** tab, click **Refresh**, scroll down, and then verify that **sales\_prospect\_name** is listed.

You can also type first few letters of the name of your property template (sales) on the Filter field to filter the list.

## **Create a Multi-valued property template.**

In this task, you will continue on the property templates page of the SalesQA object store.

- On the **Property Templates** tab, click **New**.
- From the **New Property Template** tab, enter **sales\_contact\_methods** for the **Display name** field.
- Click **Next**, select **String** from the list for the **Data type** field, and then click **Next**.
- For the **Select Choice List or Marking Set** page, leave the defaults (nothing selected) and then click **Next**.
- Select the **Multi** option for the **Single or multi-Value** field, select **Unique and ordered values** for **List order**, and then click **Next**.
- On the **Summary** page, view the details and click **Finish**.
- On the **Success** page, click **Close**.
- On the **Property Templates** tab, click **Refresh** and then verify that **sales\_contact\_methods** is listed.

## **Create a value-required property template.**

In this task, you will create a property template with a value-required status. If you want to use a property both with and without value-required status, you can set the required status as part of adding the property template to a class definition. The task is included here for you to practice setting on the property template itself.

- In the administration console, create a property template called **sales\_prospect\_id** by using the steps in the previous tasks and the following data. Accept the default values for the fields that are not listed here.
  - Name and Describe the Property Template page:
    - Display name: **sales\_prospect\_id**
    - Symbolic name: **sales\_prospect\_id**
    - Description: **sales\_prospect\_id**
  - Select the Data Type page:
    - Data type: **String**
  - Select Choice List Or Marking Set page:
    - Assign a choice list: **<None>**
    - Assign marking set: **<None>**
  - Single or Multi-Value? page:
    - Select the **Single** option
    - Select the **Set other attributes** option
  - Additional Property Template Attributes page:
    - Select the **Value required** option

When you select the Set other attributes option in the Single or Multi-Value page, the wizard opens with more pages to set other attributes for the property template.

**Single or Multi-Value?**

Choose whether the object property can hold a single value or multiple values. Most properties are single value, but if the property value.

Single or multi-value : <input checked="" type="radio"/> Single <span style="color: blue;">(i)</span> <input type="radio"/> Multi <span style="color: blue;">(i)</span>	<input type="radio"/> Non-unique and ordered values (such as lines in address) <span style="color: blue;">(i)</span> <input type="radio"/> Unique and ordered values (such as the list of primary colors) <span style="color: blue;">(i)</span>
<input checked="" type="checkbox"/> Set other attributes <span style="color: blue;">(i)</span>	

- On the **Property Templates** tab, click **Refresh** and then verify that the new property template **sales\_prospect\_id** is listed.

## Create a property template with a choice list.

- In the administration console, create a property template called **sales\_prospect\_category** by using the following values:
  - Name and Describe the Property Template page:
    - Name: **sales\_prospect\_category**
    - Symbolic name: **sales\_prospect\_category**
    - Description: **sales\_prospect\_category**
  - Select the Data Type page:
    - Data type: **String**
- On the **Select Choice List or Marking Set** page, select **Assign choice list** and then select the **Prospect Type** choice list that you created in the earlier activity.

The screenshot shows a configuration dialog titled 'Select Choice List or Marking Set'. It contains the following text: 'Assign a choice list of a string data type to the property template. The string data type is for choice lists numbers, letters, symbols, or spaces.' Below this is a link 'Learn more...'. At the bottom, there is a checked checkbox labeled 'Assign choice list' with an information icon (a blue circle with an 'i'). Underneath it is a section labeled 'Prospect Type'.

- Click **Next**, select **Single** on the **Single or Multi-Value** page, and then click **Next**.
- On the **Summary** page, click **Finish**.
- Click **Close** on the **Success** page.
- On the **Property Templates** tab, click **Refresh** and then verify that the new property template **sales\_prospect\_category** is listed.

## Create a Date Time Type property template.

- In the administration console, create a property template called **sales\_last\_contact\_date** by using the following values:
  - Name and Describe the Property Template page:
    - Name: **sales\_last\_contact\_date**
    - Symbolic name: **sales\_last\_contact\_date**
    - Description: **sales\_last\_contact\_date**

- Select the Data Type page:
  - Data type: **Date Time**
- Single or Multi-Value? page:
  - Select the **Single** option

Accept the default values for the fields that are not listed here.

- On the **Property Templates** tab, click **Refresh** and then verify that the new property template **sales\_last\_contact\_date** is listed.

## Create an Integer type property template.

- In the administration console, create a property template called **sales\_times\_contacted** by using the following values:
  - Name and Describe the Property Template page:
    - Name: **sales\_times\_contacted**
    - Symbolic name: **sales\_times\_contacted**
    - Description: **sales\_times\_contacted**
  - Select the Data Type page:
    - Data type: **Integer**
  - Single or Multi-value? page:
    - Select the **Single** option

Accept the default values for the other fields that are not listed here.

- On the **Property Templates** tab, click **Refresh** and then verify that the new property template **sales\_times\_contacted** is listed.
- Log out of the administration console and then close the browser.

# Activity: Create document and folder classes

Documents that are checked into Content Platform Engine require a class. You can organize the documents and other objects into folders. You can define the Document and Folder subclasses that are based on the needs of your organization.

In this activity, you will accomplish the following:

- Create a Folder class.
- Create a Document class.
- Test your Folder class.
- Test your Document class.

## Create a Folder class.

In this task, you will create a custom Folder class and add property definitions to the class.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **SalesQA** object store.
- From the **SalesQA** tab, expand the **SalesQA > Data Design > Classes** node on the left pane.
- Right-click **Folder** and select **New Class** from the list.  
The New Folder Class tab opens on the right pane.
- On the **New Folder Class** tab, type **Sales Prospects** for the **Display name**.  
Verify that the Symbolic name and Descriptions fields are automatically populated.  
Click outside of the Display name field.
- Click **Next**, click **Finish** on the **Summary** page, and then click **Close** on the **Success** page.
- On the **SalesQA** tab, click **Refresh**.
- Expand the **SalesQA > Data Design > Classes > Folder** node on the left pane and then click **Sales Prospects**.

- From the **Sales Prospects** tab on the right pane, select the **Property Definitions** subtab and then click **Add**.
- On the **Add Properties** page, select the following properties that you want to add to this class.
  - sales\_prospect\_category**
  - sales\_prospect\_id**

You can also type sales on the Filter field to filter the list. These are the property templates that you created in the previous activity.

- Scroll down and then click **OK** to close the **Add Properties** page.
- On the **Sales Prospects** tab, verify that the properties are listed, click **Save**, and then click **Close** to close the **Sales Prospects** tab.
- Leave the administration console opened for the next task.

## Create a Document class.

In this task, you will create a custom Document class and add Property Definitions to the class.

- From the **SalesQA** tab, expand the **SalesQA > Data Design > Classes** node on the left pane.
- Right-click **Document** and select **New Class** from the list.  
The New Document Class tab opens.
- On the **New Document Class** tab, enter **Sales Prospect Doc** for the **Display name** field.  
Verify that the Symbolic name and Descriptions fields are automatically populated. Click outside of the Display name field.
- Click **Next**, click **Finish** on the **Summary** page, and then click **Close** on the **Success** page.
- On the **SalesQA** tab, click **Refresh**.
- Expand the **Data Design > Classes > Document** node and verify that the **Sales Prospect Doc** class is listed.
- Click **Sales Prospect Doc** in the left pane.
- From the **Sales Prospect Doc** tab on the right pane, select the **Property Definitions** subtab and then click **Add**.

- On the **Add Properties** page, type **sales** in the filter to show sales-related property templates only.
- Select the following properties that you want to add to this class.
  - sales\_times\_contacted**
  - sales\_prospect\_name**
  - sales\_last\_contact\_date**
  - sales\_prospect\_category**
  - sales\_contact\_methods**
- Scroll down, click **OK** to close the **Add Properties** page and then verify that the properties are listed on the **Sales Prospect Doc** tab.

<input type="checkbox"/> Property	Data Type
<input type="checkbox"/> <a href="#">sales_contact_methods</a>	String
<input type="checkbox"/> <a href="#">sales_last_contact_date</a>	Date Time
<input type="checkbox"/> <a href="#">sales_prospect_category</a>	String
<input type="checkbox"/> <a href="#">sales_prospect_name</a>	String
<input type="checkbox"/> <a href="#">sales_times_contacted</a>	Integer

- Click **Save** and then click **Close** to close the **Sales Prospect Doc** tab.
- Log out of the administration console and then close the browser.

## Test your Folder class.

In this activity, you will create an instance of your Folder class in IBM Content Navigator and verify that the instance has the metadata as specified in the class specification. You will use the choice list and a required property.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.

The Content Navigator Sample Desktop opens in Browse view.

- Click the down arrow next to **LoanProcess** on the upper right and select **SalesQA** from the list.

- Click **New Folder** from the toolbar.
- On the **New Folder** page, under the **Properties** section, for the **Class** field, select **Sales Prospects** from the list and then click **OK**.
- Type **NYB Company** for the **Folder Name**.  
The name could be any text.
- For the **sales\_prospect\_category** field, select **Reseller** from the list and then click **OK**.  
Expand the Prospect Type node if the list is not shown.
- Enter **NYBC** for the **sales\_prospect\_id** field.  
The value for this field is required as you configured earlier. Notice that the required status is indicated by a red asterisk.

**Properties**

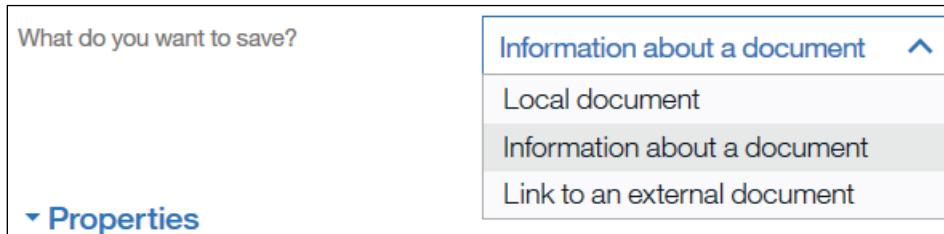
* Class:	Sales Prospects
* Folder Name:	NYB Company
sales_prospect_category:	Reseller
* sales_prospect_id:	NYBC

- Click **Add** on the lower right of the page.  
Back on the Browse page, verify that your new folder is listed.

## Test your Document class.

In this activity, you create an instance of your Document class in IBM Content Navigator and verify that the instance has the metadata as specified by the class. You can add documents to the folder that you created.

- Double-click **NYB Company** to open the folder and then click **Add Document** from the toolbar.
- On **Add Document** page, for the **What do you want to save?** field, select **Information about the document** from the list.



- Under the **Properties** section, for the **Class** field, select **Sales Prospect Doc** from the list and then click **OK**.
- Type **NYB 252** for the **Document Title** field.  
Title could be any text.
- Click the **sales\_contact\_methods** field, type **Email** on the **New** field, and then click **Add**.
- Repeat the above step to add **Phone call** and then click **OK**.
- Type or select the following values for the other fields:
  - sales\_last\_contact\_date**: **Five days before the current date**
  - sales\_prospect\_category**: **Reseller** (Select from the choice list)
  - sales\_prospect\_name**: **Victor Byrd**
  - sales\_times\_contacted**: **2**

The completed page shows the values you entered:

▼ Properties

\* Class: Sales Prospect Doc

Document Title: NYB 252

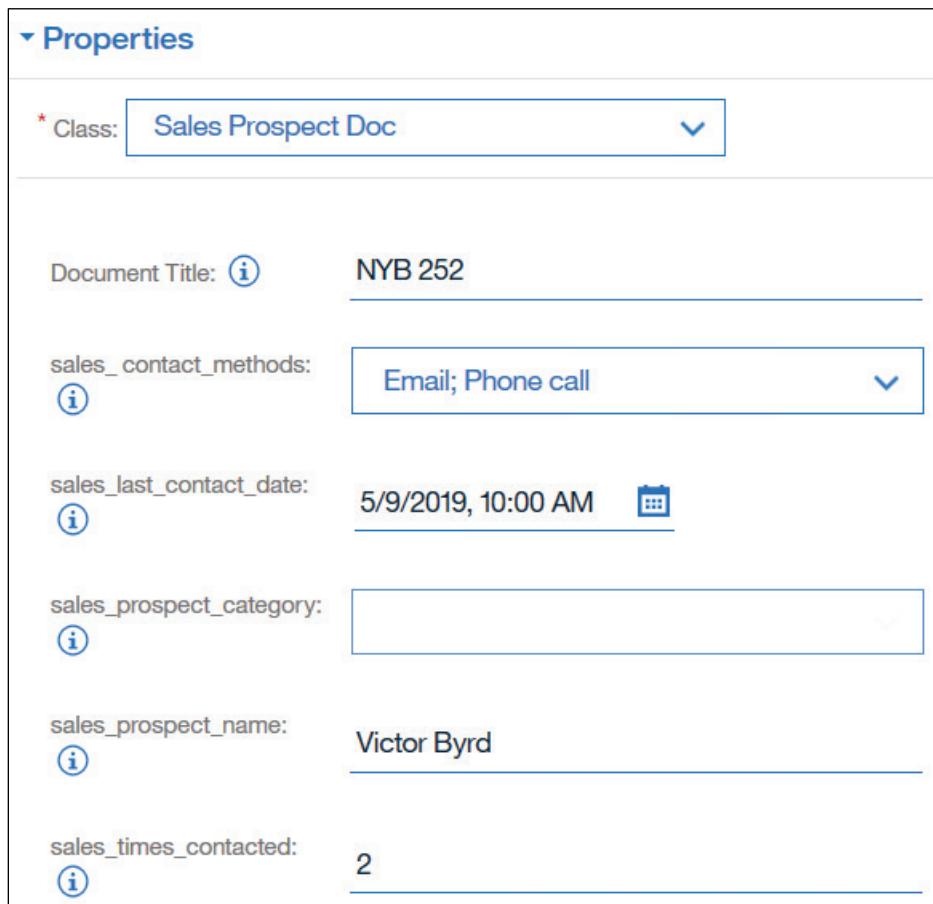
sales\_contact\_methods: Email; Phone call

sales\_last\_contact\_date: 5/9/2019, 10:00 AM

sales\_prospect\_category:

sales\_prospect\_name: Victor Byrd

sales\_times\_contacted: 2



- Click **Add** in the lower right corner.
- Back on the **Browse** page, verify that the new document is listed under your folder.
- Single-click the document and verify that the properties and their values are shown on the rightmost pane.
- Log out of ICN **Sample Desktop** and then close the browser.

# Modify classes and properties

In a development environment, you continually design, build, test, and refine your design. In some instances, you might have an application design that is a large investment in time that just needs a few minor changes. To make metadata changes, you must be aware of the metadata dependencies, and how to work around them.

## Change the display Name for a metadata object

The display name for each object is displayed in Administration Console for Content Platform Engine (ACCE) and in the IBM Content Navigator desktop. The symbolic name does not change when you change the display name. Because APIs use the symbolic name, they continue to function after the display name is changed.

You can modify the Display Name of the following objects:

- Class definitions
- Property templates
- Choice lists

An example scenario for changing a display name for a metadata object:

You originally created a property template with a display name: product\_type\_178. The Graphical User Interface (GUI) team suggests that you change the display name to a more user-friendly name. The display name is shown in the user client. You must change the name from product\_type\_178 to Product Type.

Property template modifications:

- You can rename property templates and property definitions.
- When you change the name of the property template, it is propagated to the property definitions based on the property template  
However, any other changes to the property template are not propagated to the property definitions.
- You can change the description, but cannot change the data type or cardinality.

## Modify a choice list

You can modify a choice list in the following ways:

- Change the choice list display name or description
- Add new choice items and groups
- Edit choice items and groups

You cannot delete the choice list object when it is associated with a property template.

When you change the value of an existing choice list item of a choice list:

- only the objects that are created after the change will have the new value
- the objects that are created before the change retain the old value

Refer to the IBM FileNet P8 Platform V5.5.x Knowledge Center for more on the implications of changing existing choice list items:

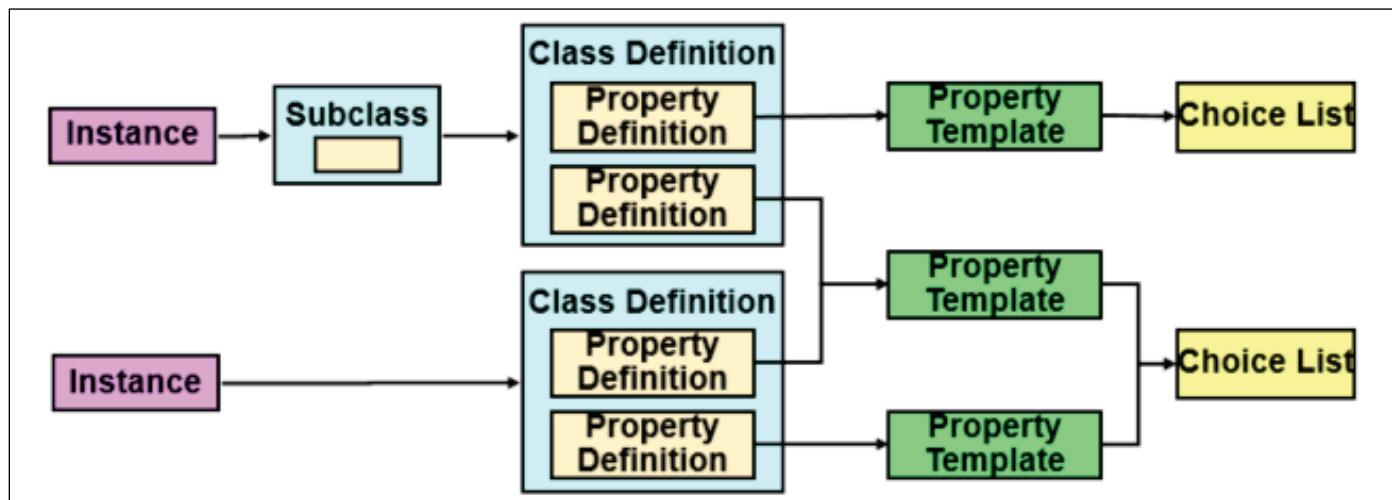
[https://www.ibm.com/support/knowledgecenter/SSNW2F\\_5.5.0/com.ibm.p8.ce.admin.tasks.doc/choicelists/chl\\_concepts\\_choice\\_lists.htm#chl\\_concepts\\_choice\\_lists\\_ex1](https://www.ibm.com/support/knowledgecenter/SSNW2F_5.5.0/com.ibm.p8.ce.admin.tasks.doc/choicelists/chl_concepts_choice_lists.htm#chl_concepts_choice_lists_ex1)

An example scenario for adding a choices group to an existing choice list:

Your company deals with hardware products. You created a choice list that is called Product Type that contains hardware items such as laptops and monitors. Your company decided to add software products to its portfolio. You must add a choices group for software items to the existing choice list (Product Type).

## How does the metadata dependencies work?

The following diagram provides a model of how class metadata is interrelated.



When one object references another object, the first object has a dependency on the second object. The following list shows the flow of dependency:

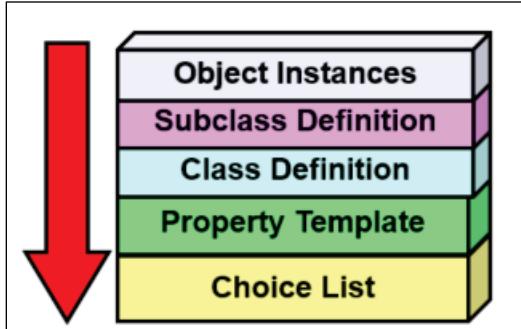
- An object instance depends on its subclass or class definition
- A subclass definition depends on its parent class definition
- A class definition depends on its property definitions
- A property definition depends on its property template
- A property template depends on its choice list

Sometimes the dependencies are complex because the metadata objects are reusable. You must consider object dependencies before deleting metadata. You cannot delete an object when another object refers to it. If you try to delete an object that is referenced by other objects, you will get an error message. Delete the referenced object or remove the reference to remove a dependency. The dependencies result in the following constraints:

- If the class has subclasses or instances, you cannot delete the class.  
To remove a dependency, you can either delete the object or edit the object to remove the dependency. If alternatives exist, avoid deleting an object to prevent data loss.
- If the property template has dependent property definitions, you cannot delete the property template.  
To delete a property template, you must remove the corresponding property definition from the class definition.
- If a choice list is used by property templates, you cannot delete the choice list.  
To delete a choice list, you must remove the choice list from the property template as well as remove the corresponding property definition from the class definition.

Remove dependencies in the following sequence, starting with object instance, subclass definition, class definition, property template, and then finally, choice list.

The following diagram shows dependencies of various objects in an object store.



Do not delete any metadata that is referenced by custom code to prevent breaking references in custom code.

Always use a test object store before you make metadata changes to a production system to identify and create solutions for any issues that might occur.

Use FileNet Deployment Manager (FDM) to move class and template definitions between object stores to help maintain consistency across environments.

The FDM topic is discussed in a later section.

# Activity: Change the property template name

In this activity, you modify the display name of a property template and check how the system displays the property name to users. This activity requires that you have completed the previous activities in the *Create property templates and classes* section.

In this activity, you will accomplish the following:

- View the property template display name before the change.
- Change the property template display name.
- Verify the name change in the Folder class.
- Update the remaining property display names.

## **View the property template display name before the change.**

In this task, you will check the property template display name.

- Ensure that the IBM FileNet P8 Platform components are started.  
If you have not started them earlier, start the components by using the earlier activity: *Prepare your system - Start IBM FileNet P8 Platform*.
- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or type the following URL: <http://vclassbase:9081/navigator>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Select the **SalesQA** repository from the list on the upper right of the page.
- Select **SalesQA** on the leftmost pane and then click the **NYB Company** folder on the middle pane to open its properties.

Single-click of the folder opens the properties, and double-click opens the folder. Expand Properties on the right pane if they are not expanded.

If the right pane is not available, click the three dots to open the right pane.

- Observe the property display name **sales\_prospect\_id**.

Properties		Edit
Class:	Sales Prospects	
Folder Name:	NYB Company	
sales_prospect_ca tegory:	Reseller	
⋮		
sales_prospect_id:	NYBC	
<a href="#">System Properties</a>		

You will change this display name to Prospect ID in the next task.

- Log out of the **ICN Sample Desktop** and close the browser.

## **Change the property template display name.**

In this task, you change the display name of the **sales\_prospect\_id** property template to **Prospect ID**.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **SalesQA** object store.
- From the **SalesQA** tab, expand the **SalesQA > Data Design** node on the left pane and click **Property Templates**.
- From the **Property Templates** tab on the right pane, type **prospect** in the filter field to make the property easier to find and then click **sales\_prospect\_id**.
- From the **sales\_prospect\_id** tab > **General** subtab, delete the existing value in the **Display name** field and then type **Prospect ID** as the new value for this field.

Observe that the Symbolic Name field and Description field continue to display **sales\_prospect\_id**. The system uses the Symbolic Name internally.

- Change the **Description** field value to **Prospect ID**, click **Save** to save the changes and then **Close**.

- In the **Property Templates** tab, click **Refresh** and then verify that the property template is listed as **Prospect ID**.
- Close the **Property Templates** tab.

## Verify the name change in the Folder class.

In this task, you will check the name change both in the administration console and in the Content Navigator client.

- In the administration console > **SalesQA** tab, click **Refresh**.
- Expand the **SalesQA > Data Design > Classes > Folder** node on the left pane and click **Sales Prospects** folder.
- On the **Sales Prospects** tab > **Property Definitions** subtab, verify that the value is displayed as **Prospect ID**.
- Log out of the administration console.

Next, you will verify the new display name for the property definition in the IBM Content Navigator.

- In the **Mozilla Firefox** browser, clear the cache by clicking **History > Clear Recent History** from the top menu.
- On the **Clear All History** window, verify that **Cache** is selected, click **Clear Now** and then close the browser.
- Reopen the **Mozilla Firefox** browser and then click the **Sample Desktop** bookmark or type the following URL: <http://vclassbase:9081/navigator>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the **Browse** page, select the **SalesQA** object store from the upper right.
- Click the **NYB Company** folder to view its properties on the right pane and verify that the property display name now shows as **Prospect ID**.



- Verify that the value of the property (NYBC) was retained.
- Log out of the ICN **Sample Desktop** and close the browser.

The name change to the property template was automatically propagated to the corresponding property definition of the class.

# Activity: Modify a choice list

In this activity, you will modify a choice list by adding a group and then verify the changes.

In this activity, you will accomplish the following:

- Add a group to a choice list.
- Verify the modified choice list.

## Add a group to a choice list.

In this task, you modify a choice list by adding a group and a few choice list items to the new group.

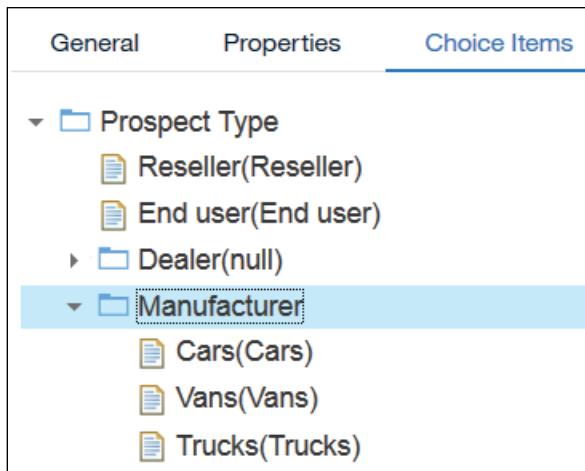
- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **SalesQA** object store.
- From the **SalesQA** tab, expand the **SalesQA > Data Design > Choice Lists** node on the left pane and click **Prospect Type**.
- From the **Prospect Type** tab on the right pane, open the **Choice Items** subtab, select the **Prospect Type** node, and then click **New Groups**.
- On the **New Groups** window, type **Manufacturer** in the **Display name** field and then click **Add**.

The group name is added to the pane.

- Click **OK**.
- On the **Choice Items** subtab, select **Manufacturer** and then click **New Items**.
- On the **New Items** page, for each of the following name, type the choice item name in the **Display name** field and then click **Add**.
  - **Cars**
  - **Vans**
  - **Trucks**

When you click outside Display name field, the value is automatically populated in the Value field. Verify that the Value field is populated before you click Add.

- Scroll down and then click **OK** to close the **New Item** window.
- In the **Prospect Type** tab, verify that your completed choice list includes the new group.



- Click **Save** to save the choice list changes and then click **Close** to close the **Prospect Type** tab.
- On the **SalesQA** tab, click **Refresh**.
- Log out of the administration console and then close the browser.

## Verify the modified choice list.

In this task, you will create a folder in the IBM Content Navigator Sample Desktop and verify that you are able select a choice item from your new choice group.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- In the Content Navigator Sample Desktop, select the **SalesQA** repository from the list on the upper right of the page.
- Click **New Folder**.
- From the **New Folder** page > **Properties** section, for the **Class** field, select **Sales Prospects** from the list and then click **OK**.
- For the **Folder Name** field, type **Test New Choice**.
- For the **sales\_prospect\_category** field, expand **Prospect Type > Manufacturer**, select **Cars** from the list and then click **OK**.

- Type **TNC** for the **Prospect ID** field.  
The value for the field is required.

**Properties**

* Class:	Sales Prospects
*Folder Name:	(i) Test New Choice
sales_prospect_category:	(i) Cars
*Prospect ID:	(i) TNC

- Click **Add** to create the folder.  
Verify that your new folder is listed.
- Click the **Test New Choice** folder and then verify that the properties are shown in the rightmost pane.  
Optional: Do the following steps to examine an existing folder (that was created before you added the new choice item) to verify the new choice group.
  - Right-click the **NYB Company** folder and then click **Properties**.
  - On the **Properties** page, for the **sales\_prospect\_category** field, select **Prospect Type > Manufacturer > Vans** from the list and then click **OK**.
  - Click **Save**.
  - Select the **NYB Company** folder and verify that the new value (**Vans**) is shown in the **Properties** section on the rightmost lane.
  - Log out of the ICN Sample Desktop and then close the browser.

# Activity: Work with metadata dependencies

In this activity, you replace a choice list with a data entry value for a property template. The updates to a property template do not automatically update the existing property definitions of a class. You must apply this change to a class definition. You must remove the original property definition from the class and add the updated one.

This change will not affect existing objects (such as a document) that use this property template, until you check out and then check in the object.

In this activity, you will accomplish the following:

- Remove the choice list from a property template.
- Remove a property definition from a class.
- Assign the property definition to the class.
- Verify the modifications.
- Examine the ProspectsFolder class.

## Remove the choice list from a property template.

In this task, you remove the association of a choice list (Prospect Type) from a property template (sales\_prospect\_category) and make the template a data entry value.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **SalesQA** object store.
- From the **SalesQA** tab, expand the **SalesQA > Data Design** node on the left pane and then click **Property Templates**.
- On the **Property Templates** tab, type **sales** in the filter and then click **sales\_prospect\_category**.
- From the **sales\_prospect\_category** tab, open the **Properties** subtab and then click the **Property Name** column to list the items in alphabetical order.
- Scroll down and find the **Choice List** property.

Observe that this property template is associated with the Prospect Type choice list.

- To remove the association of the choice list, click the down arrow next to it and select **Unset Value**.

Property Name	Property Value	Data Type
Choice List	Prospect Type	   <input checked="" type="checkbox"/> Copy Object Reference
Class Description	Property Template String	<input type="checkbox"/> Paste Object <input type="checkbox"/> Unset Value

- Verify that the **Choice List** field shows **<Value not set>** and then click **Save** to save the changes.

This change makes the sales\_prospect\_category a data entry property template (without a choice list).

- Leave the **sales\_prospect\_category** tab open for the next ask.

## Remove a property definition from a class.

In this task, you will check the classes that use the sales\_prospect\_category property template and then you will remove the original (prior to modification) sales\_prospect\_category property definition that is associated with the Sales Prospect Doc class definition.

- From the **sales\_prospect\_category** tab > **Properties** subtab, click the **Property Name** column to list the items in alphabetical order (if the list is already not ordered).
- Scroll down to find the **Used in Classes** property, click the down arrow to go to the list, and then observe the classes that use this property template.

Sales Prospects and Sales Prospect Doc are listed.

Used in Classes	Used in Classes
Uses Long Column	   Sales Prospects

- Close the **sales\_prospect\_category** tab.
- On the **Property Templates** tab, click **Refresh** and then close the tab.
- From the **SalesQA** tab, expand the **SalesQA > Data Design > Classes > Document** node on the left pane and then click **Sales Prospect Doc**.

- From the **Sales Prospect Doc** tab, click the **Property Definitions** subtab, select the **sales\_prospect\_category** property definition, and then click **Remove**. Verify that the property is removed from the list.
- Click **Save** and then click **Close** to close the tab.
- In the **SalesQA** tab, click **Refresh**.

## **Assign the property definition to the class.**

In this task, you will assign the modified sales\_prospect\_category property (without the choice list) to the Sales Prospect Doc class.

- From the **SalesQA** tab, expand the **SalesQA > Data Design > Classes > Documents** node on the left pane and then click **Sales Prospect Doc** class.
- From the **Sales Prospect Doc** tab, open the **Property Definitions** subtab and then click **Add**.
- On the **Add Properties** page, type **prospect** into the filter, select **sales\_prospect\_category**, scroll down, and then click **OK**. Verify that the property is added to the list. This adds the updated property definition.
- Click **Save** and then click **Close** to close the tab.
- In the **SalesQA** tab, click **Refresh**.
- Log out of administration console and then close the browser.

## **Verify the modifications.**

In this task, you will create a document of the Sales Prospect Doc class and verify the change in the property definition. IBM Content Navigator (ICN) has a metadata cache that retains metadata in the application for an interval. To refresh the metadata within that interval, you must restart the ICN application first in the WebSphere Integrated Solutions Console.

- In the **Mozilla Firefox** browser, click the **WAS** bookmark or enter the following URL: <https://vclassbase:9043/ibm/console/logon.jsp>
- Type the following values for user ID and password and click **Log in**.
  - User ID: **wasadmin**
  - Password: **FileNet1**
- In the console, expand the **Applications > Application Types** and then click the **WebSphere enterprise applications** node on the left pane.

- On the right pane, select **navigator** from the list and then click **Stop**.  
Wait until the message is shown.
- Select **navigator** again and click **Start**.  
Wait until the message is shown. It takes a while.
- Log out of the **WebSphere Integrated Solutions Console**.
- Clear the **Firefox** browser cache:
  - In the Tools bar, click **History > Clear Recent History**.
  - In the **Clear All History** window, verify that **Cache** is selected and then click **Clear Now**.
  - Close the browser.
- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- In the ICN Sample Desktop > **Browse** page, select the **SalesQA** repository from the list on the upper right of the page.
- Expand the **SalesQA** object store node and click the **NYB Company** folder to open.
- Click **Add Document** in the tool bar.
- On **Add Document** page, for the **What do you want to save?** field, select **Information about the document** from the list.
- In the **Properties** section, select **Sales Prospect Doc** from the list for the **Class** field and then click **OK**.
- Enter the following values for the other fields:
  - Document Title: **Test Prop**
  - sales\_prospect\_name: **Gloria Stanton**
- For the **sales\_prospect\_category** field, notice that there is no choice list, type **Dealer** for the value and then click **Add**.
- Verify that your new document is listed in the folder, click the document, and view the values of the properties that you entered on the right pane.

## Examine the ProspectsFolder class.

Recall that you created a Folder class (Sales Prospects) that also uses the sales\_prospect\_category property template. This class still retains the choice list, because this property definition for the folder class was not updated after you removed the choice list from the template. The change in the property template is not automatically propagated to the classes.

In this task, you will verify the sales\_prospect\_category property of the folder class.

- On the ICN desktop **Browse** page, click **SalesQA** on the left pane and then select the **NYB Company** folder from the middle pane.
- Click **Action > Properties** from the toolbar.
- On the **Properties** page, click the down arrow next to the **sales\_prospect\_category** property to edit the value and verify that the choice list is available.
- Click **Cancel** to close the choice list.
- Click **Cancel** to close the **Properties** page.
- Log out of the ICN **Sample Desktop** and close the browser.

# Use events and subscriptions

In this section, you learn how to use events and subscriptions to extend Content Platform Engine functions.

## About server extensions

You can extend Content Platform Engine (CPE) functions in the following ways with your own server-based action handlers: Events and Subscriptions, Change Preprocessors, Custom Sweeps, Document Lifecycle Policies, and Automatic Document Classification

The above methods are implemented in either Java or JavaScript. Java interfaces are provided with the product and you create your action handlers by implementing them. The application developer for your company provides the code for the action handlers. As the solution builder, you create required Content Platform Engine objects that use the code to initiate the required actions.

In this course, you will learn about Events and Subscriptions.

## What are events and subscriptions?

A subscription is a device for starting a user-implemented, server-side component that extends the core functionality of the Content Platform Engine (CPE).

Events provide a mechanism for initiating actions that are invoked when objects are created, modified, and deleted.

A subscription has the following three elements:

- One or more trigger events
  - A specified action on an object in an object store.  
For example, the following actions can be performed on a document: Add document (create), check-in, check-out, update a metadata value, or delete
- Subscription target object
  - It is a CPE object upon which the events can be triggered. Examples of objects include documents and folders.
- Event action or workflow (or both)
  - It identifies an event action handler that runs when an event is triggered on a target object.

For example, you can have a subscription that notifies you by email (event action) when documents of a particular class (target object) are created (triggered event).

## Event actions

You can configure the Content Platform Engine (CPE) to run user-defined code in response to system or custom events. This user-defined code is called an event action handler, which you register with CPE as an event action. By using a subscription, you associate an event action with one or more events and objects.

The code is in Java (or JavaScript) that a developer implements by using the Content Engine API `EventHandler` interface in the Content Engine API.

A handler can be implemented in the following ways:

- A class file that is in the Java virtual machine (JVM) class path
- A class or JAR file that is contained in a code module

## Code modules

A code module is a CPE object that contains one or more Java action handlers and any supporting libraries. You can create a code module in Administration Console for Content Platform Engine (ACCE).

Code modules are automatically available when the CPE is deployed to multiple application server instances, or when you move your content metadata from one system to another.

If you modify the code for a Java event action handler that is contained within a code module, you must update any event action that references the code module.

## Types of subscriptions

- Event Subscription: runs user-defined code
- Workflow Subscription: launches an IBM FileNet P8 workflow

## Define subscription filter

You can create a filter to restrict the application scope of a subscription.

For example, you can filter out creation events that are triggered by check-out events. A creation event occurs when a user adds a document or checks out a document (a new reservation object is created). If you want to do something only when adding a document, you must filter out the creation events that are caused by a check-out by adding the following filter:

```
MajorVersionNumber=1 and  
MinorVersionNumber=0) OR (MajorVersionNumber=0 and  
MinorVersionNumber=1)
```

The filter in the preceding example applies to the new document object (the source object) that is passed into the event handler. As a new document, it has a version number of 1.0 or 0.1.

## Workflow subscription

The workflow subscription starts the workflow event action, which in turn launches a workflow. The subscription specifies a workflow in addition to specifying the trigger event, target object, and event action.

The workflow definition must exist in the object store and must be transferred. A workflow subscription applies to a specific version of a workflow definition. If the workflow definition is updated, then the workflow subscription must be updated as well.

## Subscriptions run mode

Event subscriptions can be run synchronously or asynchronously.

- In a synchronous subscription, the operations of the object and the event actions are completed as a single transaction. Failure in either results in rollback of both operations.
- In an asynchronous subscription, the operations of the object and the event actions are completed as separate transactions. Object operation can succeed independently of the event action operations.

## Disabling subscriptions

You can disable a subscription without deleting it. For example, you can disable it for testing and while you fix a problem. After you change the event action, re-enable the subscription.

- Deleting a subscription is permanent, but disabling the subscription is temporary.
- For disabled subscriptions, the Enabled column displays the value False.

# Activity: Create a subscription with an event action

In this activity, you create a code module with a Java class, an event action, and a subscription for the Order document subclass. The Java class (available as a JAR file) is already created for the student system. You associate the event action with the subscription and test it by creating an Order document. Document creation triggers the subscription and the code is executed which creates an entry in a log file.

In this activity, you will accomplish the following:

- Create an Event Action.
- Create a Subscription.
- Test the Subscription and Event Action.
- Examine the EventLog.txt file.

## Create an Event Action.

In this task, you will create an event action and specify the code module. The Java class (available as a JAR file) is already created for the student system.

- Ensure that the IBM FileNet P8 Platform components are started.  
If you have not started them earlier, start the components by using the earlier activity: *Prepare your system - Start IBM FileNet P8 Platform*.
- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **Sales** object store.
- From the **Sales** tab, expand the **Sales > Events, Actions, Processes** node on the left pane and then click **Event Actions**.
- From the **Event Actions** tab on the right pane, click **New**.
- On the **New Event Action** tab, type **Log Event Action** in the **Display name** field and then click **Next**.
- Make sure that the **Enabled** option is selected for the **Status** field and the **Class** option for the **Type** field.

- For the **Java class handler** field, type the following text:  
**com.ibm.filenet.edu.LogEventActionEDU**

Type the Java class name exactly as shown because it is case-sensitive.

- Select the **Configure code module** option.

**Specify the Type of Event Action**

If you create a custom workflow event action, you must also add the code necessary to launch a workflow.

Status :	<input checked="" type="checkbox"/> Enabled <a href="#">(i)</a>
Event action type :	<input type="checkbox"/> Workflow <a href="#">(i)</a>
Type :	<input type="radio"/> JavaScript <a href="#">(i)</a>
	<input checked="" type="radio"/> Class <a href="#">(i)</a>
* Java class handler :	<a href="#">(i)</a> com.ibm.filenet.edu.LogEventActionEDU
<input checked="" type="checkbox"/> Configure code module <a href="#">(i)</a>	

- Click **Next** and then click **Browse** on the **Specify the Code Module** page.
- On the **File Upload** window, navigate to the **C:\Training\F2810G** folder, select **EDULog.jar** and then click **Open**.
- Back on the **New Event Action** tab, for the **Code module title** field, type **Log Event Action**.

**Specify the Code Module**

Specify a new or existing code module.

* Code module title : <a href="#">(i)</a>	Log Event Action	<a href="#">Load Existing</a>
* Content elements : <a href="#">(i)</a>		
<input type="checkbox"/> Name	<input type="checkbox"/> Type	<a href="#">Browse</a>
<input type="checkbox"/> EDULog.jar	application/java-archive	<a href="#">Remove</a>

- Click **Next**, review the entries that you made on the **Summary** page, and then click **Finish**.
- On the **Success** page, click **Close**.
- On the **Event Actions** tab, click **Refresh**, verify that the event action that you created is listed, and then close the tab.

## Create a Subscription.

In this task, you will create a subscription and specify subscription behavior.

- On the **Sales** tab, click **Refresh**.
- On the left pane, expand **Sales > Data Design > Classes > Document**, right-click **Order**, and then click **New Subscription** from the list.
- From the **New Subscription** tab on the right, type **Log Subscription** in the **Display name** field, verify the **Description** field, and then click **Next**.
- For the **Scope** field, leave the default option of **Applies to all objects of this class** and then click **Next**.
- For the **Triggers** field, select **Creation Event** from the **Event Name** list and then click **Next**.
- Select **Log Event Action** from the list.

**Select an Event Action**

Select the event action that defines the actions to be taken when the subscription is triggered.

\* Select an event action : i

<a href="#">Workflow Event Action</a>
<a href="#">Workflow Event Action</a>
<a href="#">Log Event Action</a>

- Click **Next** and on the **Specify Additional Options** page, select the **Enable this subscription** and **Include subclasses** options.
- For the **Filter expression** field, type the following text:

**(MajorVersionNumber=1 and MinorVersionNumber=0) OR  
(MajorVersionNumber=0 and MinorVersionNumber=1)**

The filter expression ensures that the triggering event occurs only when the document is first added to the repository.

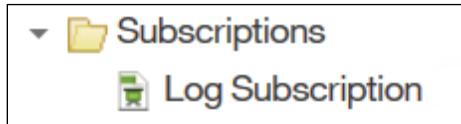
Because checking in a document can also trigger creation event. You want the event action to get triggered only when you add a document and not when you check in a document.

**Specify Additional Options**

Configure options for the event action and the associated event action handler.

Initial state :	<input checked="" type="checkbox"/> Enable this subscription
Subclass option :	<input checked="" type="checkbox"/> Include subclasses
Subscription run mode :	<input type="checkbox"/> Run synchronously
Filter expression : <a href="#">(MajorVersionNumber=1 and MinorVersionNumber=0) OR (MajorVersionNumb</a>	
Filter property name : <a href="#">(MajorVersionNumber=1 and MinorVersionNumber=0) OR (MajorVersionNumb</a>	

- Click **Next**, verify the summary of details, and then click **Finish**.
- On **Success** page, click **Close**.
- From the **Sales** tab, and click **Refresh**.
- On the left pane, expand **Sales > Events, Actions, Processes > Subscriptions** and then verify that **Log Subscription** is listed.



## Test the Subscription and Event Action.

The Java code contains instructions to write an entry into a log file each time a document of the class that is associated with this subscription is created. In this task, you will create a folder and a document and test the subscription.

- From the **Sales** tab, expand **Sales > Browse > Root Folder** node on the left pane.
- Right-click the **Root Folder** and then click **New Folder**.
- From the **New Folder** tab on the right pane, type **Test Events Folder** for the **Folder name** field.  
Leave the default value (Folder) for the **Class** field.
- Click **Next**, leave the default values for all other fields, and then click **Next** again.
- On the **Summary** page, click **Finish** and then click **Close** on the **Success** page.
- On the **Sales** tab, click **Refresh** to refresh the object store.
- On the **Sales** tab, expand the **Sales > Browse > Root Folder** node on the left pane, right-click **Test Events Folder**, and then click **New Document**.
- From the **New Document** tab on the right pane, type **Log Test** as the **Document title**.

- Select **Order** from the list for the **Class** field.  
This step is very important since you configured the Order document class for subscription.
- Clear the **With Content** checkbox and complete the wizard by clicking **Next** several times.  
Leave the default values for all the fields.
- On the **Summary** page, click **Finish** and then click **Close** on the **Success** page.
- From the **Sales** tab, expand **Sales > Browse > Root Folder** node on the left pane and click **Test Events Folder**.
- From the **Test Events Folder** tab, click **Refresh**.  
Verify that the new document (Log Test) is listed.
- Log out of the administration console and then close the browser.

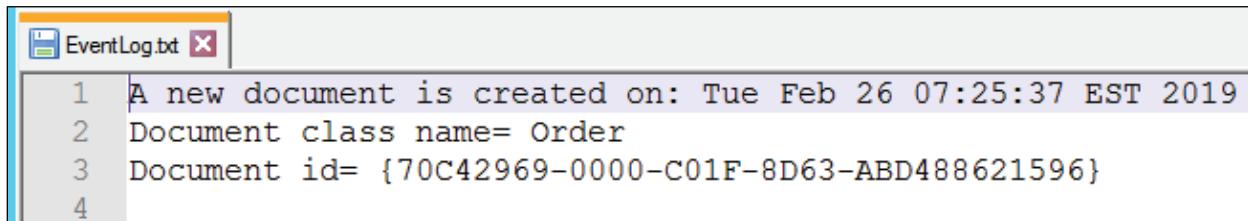
## Examine the EventLog.txt file.

In this task, you will verify the log file for the entry that is created by the event action.

- In **Windows Explorer**, open the following folder: **C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01**.
- Open the **EventLog.txt** file in **Notepad++** and verify that the file contains current date, time and an entry for the **Order** document that you created.

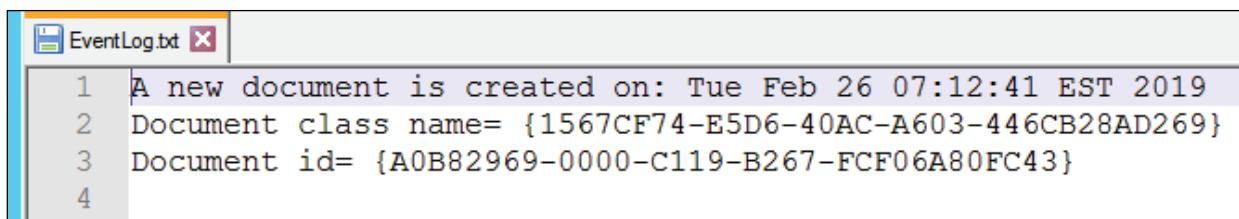
The code for the Log Action adds a text line to the EventLog.txt file each time that the event action executes.

When you test it in the admin console (ACCE), it shows the class:



```
EventLog.txt
1 A new document is created on: Tue Feb 26 07:25:37 EST 2019
2 Document class name= Order
3 Document id= {70C42969-0000-C01F-8D63-ABD488621596}
4
```

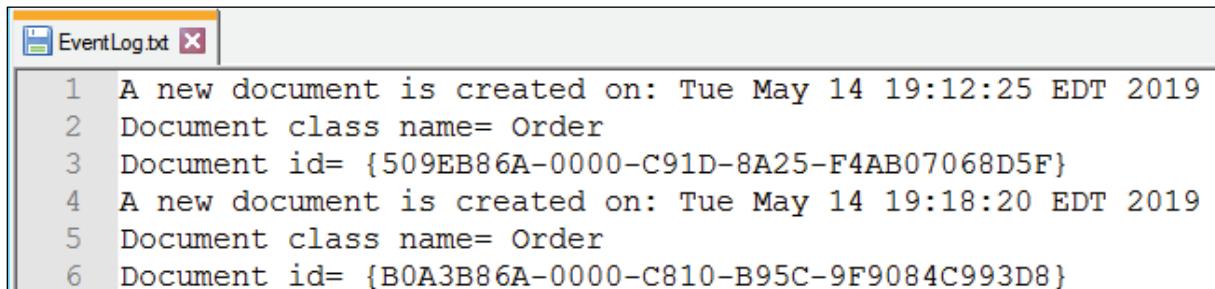
If you test in the IBM Content Navigator desktop, document class is shown as GUID:



```
EventLog.txt
1 A new document is created on: Tue Feb 26 07:12:41 EST 2019
2 Document class name= {1567CF74-E5D6-40AC-A603-446CB28AD269}
3 Document id= {A0B82969-0000-C119-B267-FCF06A80FC43}
4
```

- Close the **EventLog.txt** file.

Optional step: You can add another document by using the steps in the previous task and check the EventLog.txt file for more entries.



```

EventLog.txt

1 A new document is created on: Tue May 14 19:12:25 EDT 2019
2 Document class name= Order
3 Document id= {509EB86A-0000-C91D-8A25-F4AB07068D5F}
4 A new document is created on: Tue May 14 19:18:20 EDT 2019
5 Document class name= Order
6 Document id= {B0A3B86A-0000-C810-B95C-9F9084C993D8}

```

Optional task: You can add a document in the IBM Content Navigator desktop by using the following steps and check the EventLog.txt file for the log entry.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the **Browse** page, click the down arrow next to **LoanProcess** on the upper right and select **Sales** from the list.
- Double-click **Test Events Folder** to open the folder and then click **Add Document** from the toolbar.
- On **Add Document** page, for the **What do you want to save?** field, select **Information about the document** from the list.
- Under the **Properties** section, for the **Class** field, select **Order** from the list and then click **OK**.
- Type **Log Test 5** for the **Document Title** field.  
Title could be any text. Leave the default values (or no values) for all other fields.
- Click **Add** in the lower right corner of the page.
- Back on the **Browse** page, verify that the new document is listed under your folder.
- Log out of ICN **Sample Desktop** and then close the browser.
- In **Windows Explorer**, open the **EventLog.txt** file (in **Notepad++**) from the **C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01** folder.

Verify that the file contains an additional entry and the document class value is shown as GUID.

# Activity: Update the event action with new code module

In an example scenario, your management wants to include the user who creates the document in the event log every time a document is added. Your developer provides the new JAR file that contains the updated code.

In this activity, you will modify the code module to use the new JAR file. You will also update the Event Action that references the code module and test it.

In this activity, you will accomplish the following:

- Update the code module.
- Update the Event Action.
- Test the updated code module

## Update the code module.

In this task, you will check out the existing code module and then check in a new version of code module that contains the updated code.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **Sales** object store.
- From the **Sales** tab, expand the **Sales > Browse > Root Folder** node on the left pane and then click **Code Modules**.
- From the **CodeModules** tab on the right pane, click the **Log Event Action** link.
- From the **Log Event Action** tab, click the **Action** button, and then select **Checkin, checkout, cancel > Exclusive Check Out**.
- On the **Exclusive Checkout** page, select the **EDULog.jar** option and then click **Checkout**.
- From the **Log Event Action** tab, click the **Action** button again, and then select **Checkin, checkout, cancel > Checkin**.
- On the **Check In** window, click **Add**.
- On the **Add Content Element** page, click **Browse**.

- Navigate to **C:\Training\F2810G**, select **EDULogv2.jar**, and then click **Open**. This jar file contains the updated code.
- Back on the **Add Content Element** page, click **Add Content**.
- Back on the **Check In** page, scroll down and then click **Check In Major Version**.
- From the **Log Event Action** tab, click **Refresh** and then verify that the new version (**Version: 2.0**) is created.  
Both the tab and the Major version number field shows the version value.
- Leave the **Log Event Action** tab open.

## **Update the Event Action.**

In this task, you will update the event action to associate it with the new version of code module. You will use the object reference for the new code module version.

The Log Event Action tab is already open in the administration console.

- From the **Log Event Action** (code module) tab, open the **Versions** subtab and then select **Log Event Action** for the **version 2**.  
Select the checkbox on the first column.
- From the toolbar, click the **Action** button, and then select **Copy Object Reference**.
- On the left pane, expand **Sales > Events, Actions, Processes > Event Action** and click **Log Event Action**.
- From the **Log Event Action** tab, click the **Properties** subtab.  
Make sure the tab for event action is selected, because the code module tab also has the same name (but has the version number).
- Click the **Property Name** column header to order the properties in alphabetical order and then scroll down to the **Code Module** property.
- Click the down arrow to the right of the **Code Module** field, then click **Paste Object**.

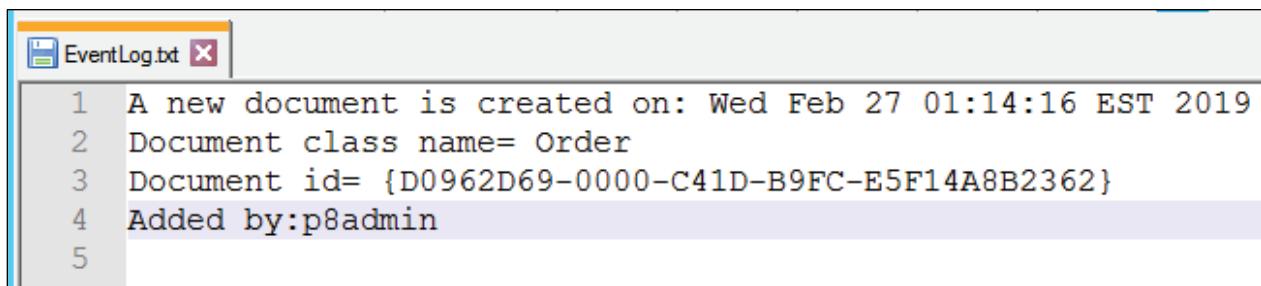


- Click **Save** to save your change to the event action and then click **Close**.
- Close the **Log Event Action** tab.

## Test the updated code module.

In this task, you test the updated code module, by adding a document and verifying the log file that is created. You are in Administration Console for Content Platform Engine and the Sales object store is already open.

- In the **Sales** tab, expand **Sales > Browse > Root Folder** on the left pane, right-click **Test Events Folder** node, and then click **New Document**.
- Enter **Log Update** as the **Document title** and then select **Order** from the list for the **Class** field.
- Clear the **With Content** checkbox and then complete the wizard by clicking **Next** several times.  
Leave the default values for all the fields.
- In the **Summary** page, click **Finish** and then click **Close** to close the **New Document** tab.
- In the **Sales** tab, expand **Sales > Browse > Root Folder** on the left pane, click **Test Events Folder** node.
- From the **Test Events Folder** tab on the right, click **Refresh** and then verify that the new document (**Log Update**) is listed.
- In **Windows Explorer**, navigate to the **C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01** folder.
- Open the **EventLog.txt** file in **Notepad++** and verify that the file contains current date, time, and an entry for the **Order** document that you created and name of the user.



```

EventLog.txt

1 A new document is created on: Wed Feb 27 01:14:16 EST 2019
2 Document class name= Order
3 Document id= {D0962D69-0000-C41D-B9FC-E5F14A8B2362}
4 Added by:p8admin
5

```

The updated code module generates an event log entry that also includes the name of user that added the document. On the student system, you might have more entries depending on the number documents added in the two activities.

- Close the **EventLog.txt** file, log out of the administration console, and then close the browser.

# Configure security for IBM FileNet P8 assets

In this section, you will learn about the IBM FileNet P8 Platform provided framework for security and how to control access to IBM FileNet P8 Platform assets on the system.

## What is authentication?

Authentication is the act of verifying a user identity based on credentials (user name and password) that the user presents (who is the user?).

Authentication of individuals through the external authentication mechanism, is key to the security features in IBM FileNet P8 Platform.

The two main authentication standards that are used by IBM FileNet P8 Platform are:

- Java Authentication and Authorization Service (JAAS)

The JAAS standard forms the framework for security interoperability in the Java EE world.

- Web Services Security

The Web Services Security standard forms the framework for security interoperability in the heterogeneous world of clients and servers that communicate through web services interfaces.

## Example of an authentication error

A user tries to log into IBM Content Navigator and receives a login error.

- Error message: *The user ID or password is not valid for the server.*

Causes: User is not a member in the LDAP directory or the LDAP directory service is not reachable.

Solution: Ensure that LDAP is running and reachable by the Content Platform Engine and check the LDAP directory to verify that the user exists.

## Authentication providers

An authentication provider is a supported LDAP-compliant directory service that provides authentication for the FileNet P8 domain. The authentication provider is identified during IBM FileNet P8 Platform installation through the JAAS configuration.

Supported directory service providers include IBM Security Directory Server, CA Directory, NetIQ eDirectory, Oracle Internet Directory Server, and Microsoft Active Directory.

For a complete list of authentication providers, refer to the Software Product Compatibility Report (SPCR) for IBM FileNet Content Manager that can be generated on the following site:

<https://www.ibm.com/software/reports/compatibility/clarity/softwareReqsForProduct.html>

## LDAP single entity lookup behavior

If you have multiple LDAPs configured, a new option is provided through the com.filenet.engine.directory.DuplicateHandling JVM argument to control how the server deals with potential duplicate user and group names. This option can be used to improve the performance of user and group lookups when name uniqueness is guaranteed.

For more details on this topic, refer to the IBM FileNet P8 Platform V5.5.x Knowledge Center:

[https://www.ibm.com/support/knowledgecenter/SSNW2F\\_5.5.0/com.ibm.p8.performance.doc/p8ppt332.htm](https://www.ibm.com/support/knowledgecenter/SSNW2F_5.5.0/com.ibm.p8.performance.doc/p8ppt332.htm)

## What is authorization?

Authorization is the act of allowing a user to complete actions on the object based on the user and group memberships (What can the user do?).

Authorization requires prior authentication and uses the security token that is generated during authentication.

When an authenticated security principal (user or group) attempts to access FileNet P8 objects such as an object store, a folder, or a document, Content Platform Engine checks that principal's user and group memberships from the directory service provider against the permissions assigned to the object. If successful, the user is authorized to carry out actions on the object as described by the access rights.

## Example of an authorization error

A user tries to log in to IBM Content Navigator and receives a login error. This user is a verified member in the LDAP directory.

- Error message: *You do not have the appropriate permissions to access the following repository: <repository name>*

Cause: User is not authorized to view the object store that is defined for Authentication on the IBM Content Navigator desktop.

Solution: Ensure that the user is authorized to access the object store.

## User roles

Different user roles provide varying level of access to the objects. For example, administrators, solution builders, authors, and users might have different access rights to the same objects.

Even administrators with access to Administration Console for Content Platform Engine can have different levels of access to objects. For example, one administrator might have permission to modify property templates that another administrator has no access.

## User and groups

The directory service defines the security principals (user or group). Users are assigned to groups. Use groups as primary security principals whenever possible.

### #AUTENTICATED-USERS group

This special group represents all users in the LDAP domain and who have been authenticated by the application server. You use this group if you want to grant access to an object to all users of IBM FileNet P8 Platform. If you do not specify initial users, #AUTENTICATED-USERS group is added automatically.

In a production environment, configure initial user groups to prevent an object store from being used by all domain users.

In development and test environments, it can be useful to give this group basic rights and then work on refining access within the object store.

## Object ownership

Most objects have an owner who is typically the user who created the object. IBM FileNet P8 Platform automatically applies an internal special user account called the #Creator-Owner and grants full control access on that object.

## IBM FileNet P8 object security terms

Object access rights (which are also called permissions) determine which users can access the objects and what kind of tasks the users can do. Following are the key terms used in the IBM FileNet P8 Platform security:

- Access Control List (ACL)

Each securable Content Platform Engine object has an associated security descriptor, part of which is the Access Control List (ACL). An ACL is a collection of all the Access Control Entries (ACEs) on an object.

- Access Control Entry (ACE)

An ACL consists of a set of Access Control Entries (ACEs) which are also called permissions. ACEs define who can do what.

- Security Identifier (SID)

Each ACE consists of a globally unique Security Identifier (SID). It uniquely identifies a security principal which is a user or group that Content Platform Engine grants or denies access to.

Each permission specifies one security principal (user or group) through a SID, and an access mask for that SID. The access mask defines the specific operations that the grantee identified by the SID is allowed to perform. Each bit in the mask corresponds to a specific operation. If the bit is set, the security principal is authorized to perform that operation.

## **Security sources of ACE**

Every ACE has a source either Default Security, Direct Instance Security, Security Inheritance or Security Template. You can view the source types of ACE in the security editor of Administration Console for Content Platform Engine (ACCE).

- Direct Instance Security

These permissions are directly added to an object and the ACEs are directly editable. You can view the access control entries (ACE) for a document in its Security tab in ACCE. All the ACEs in the list make up the ACL of that document.

- Default Security

Default permissions are placed on an object (Example: document or folder) by the default instance security ACL of its class (Example: Document class or Folder class) as well as permissions placed on a subclass by its parent class.

Default ACEs are directly editable, but if you edit an ACE, then its source type becomes Direct.

You can view the ACL for a Document class in its Default Instance Security tab in ACCE. ACL on this tab will show up in the security tab of the documents that belong to this class.

- Security Inheritance

In this scenario, permissions are passed from a parent object to a child object. For example, a folder could be a parent of a subfolder or a document. Because of the security inheritance, an administrator can apply security permissions to many objects in one operation by setting the permissions at the parent level.

- Security Template

Template permissions are assigned to the objects by a security policy. Security policies along with document versioning states allow an administrator to configure the system to automatically modify ACLs on documents when their versioning state changes. For example, the administrator can configure a system to automatically grant access to a document to a wide audience when it is released.

## **Order in which security source permissions are granted**

Each ACE has one access type either allow or deny. When evaluating the access granted by a particular ACL, the current system applies ACEs in the following order:

- Direct/Default - Deny
- Direct/Default - Allow
- Template - Deny
- Template - Allow
- Inherit - Deny
- Inherit - Allow

Higher on the list takes precedence over the lower items. Deny takes precedence over allow within each category. For example, if you explicitly deny an access right to a group and explicitly allow it to a member of that group, the access right will be denied to the member.

## **Independent and dependent security**

Most objects have Access Control Lists (ACLs) that can be independently set. These objects are called independently securable.

Dependently securable objects depend on their parent object for their access rights. They are secured through the parent object.

Examples of dependently securable objects:

- Content elements, which have the same security as the associated document
- The individual choices in a choice list, which have the same security as the object that the choice list is assigned to
- A lifecycle state in a lifecycle policy

## Designing a secure system

Security is more than securing documents and folders. The security of the system design determines which objects are securable by which users. For example, administrators might be responsible for securing the domain root and the object stores. Application builders might be responsible for securing classes, instances like stored searches and entry templates, and property templates. Authors might be responsible for securing folders and documents.

The design also includes the security of the servers, databases, as well as the object store content. For example, security must be configured on the shared directory location under which file storage areas, fixed storage area staging directories, advanced storage area file system devices, and content cache areas will be created.

## IBM Content Navigator Desktop security

A desktop is configured to authenticate users against a specific repository in your environment. Users who want to access this desktop must be defined as having access to that repository. Also, you can limit access to the desktop to a specific set of users and groups in your repository.

A user can log in to Administration Console for Content Platform Engine but be unable to log in to the IBM Content Navigator (ICN) Desktop if that user is not authorized to access that specific object store.

For more information on the content security and ICN, refer to the ICN Knowledge Center:

[https://www.ibm.com/support/knowledgecenter/SSEUEX\\_3.0.5/com.ibm.usingeuc.doc/euche014.htm](https://www.ibm.com/support/knowledgecenter/SSEUEX_3.0.5/com.ibm.usingeuc.doc/euche014.htm)

## Important Note: requirement for the activities

Following activities (lab exercises) in the Security section builds on their previous activities. For the activities to work correctly, it is important that they are done in the order it is presented and not to skip any of them.

# Activity: Identify access issues

IBM Content Navigator (ICN) is the primary client through which users access the contents of the IBM FileNet Content Manager repositories. In this activity, you will log in to ICN as different users and identify a few scenarios where a login failure happens or access is denied.

In this activity, you will accomplish the following:

- Examine the authentication login error.
- Log in as an unauthorized user.
- Observe object store access.
- Check the security in the ICN admin desktop.

## Examine the authentication login error.

In this activity, you will attempt to log in to IBM Content Navigator as a user who is not a member of the LDAP directory and examine the error when authentication fails.

- Ensure that the IBM FileNet P8 Platform components are started.  
If you have not started them earlier, start the components by using the earlier activity: *Prepare your system - Start IBM FileNet P8 Platform*.
- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>
- Type **Jayda** for the **User** name field, **FileNet1** for the **Password** field, and then click **Log In**.
- Notice that you get the following error: *The user ID or password is not valid for the server.*
- Verify that the **Content Engine Startup Context (Ping Page)** is running by entering the following URL in a separate browser tab:  
<http://ecmedu01:9080/FileNet/Engine>

You can also use the bookmark (Bookmarks menu > System Health > CE Ping).

When the ping page is displayed, you have verified that the Content Platform Engine is running.

Optionally, you can open the active directory and verify that this user (Jayda) does not exist.

Similar errors can also occur if the LDAP directory service is not reachable. In a scenario where the user exists in the LDAP directory and you still get this error, you must look at the error logs to check if the LDAP service is reachable.

- Close the browser.

## **Log in as an unauthorized user.**

A user, in addition to being a member of the LDAP directory, must have permission (authorization) on the object store (that is used for authentication) in order to log in to the IBM Content Navigator (ICN) client. The student system already has a user called Scott who is a verified member in LDAP but does not have permission to access the object store that is used for authentication. In this task, you will attempt to log in as this user and examine the error when authorization fails.

Note that if an object store is configured to provide access to the #AUTHENTICATED USERS group, then anyone who can log in to the domain can have access to that object store. The student system does not have this configuration, so only users who have explicit permission can access the object store.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>.
- Type **Scott** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Verify that you cannot log in and get the following error: *You do not have the appropriate permissions to access the following repository: <repository name>*

Notice that this time, the error message is different from the one that you got in the previous task. It provides a clue about the underlying cause of the login failure.

Scott does not have access to the object store that is defined for authentication for this ICN desktop. A user must have access to the object store that ICN uses for authentication to log in. In some cases, an authorization problem might appear to be an authentication problem.

- Close the browser.

## Check the security in ICN admin desktop.

A desktop is configured to authenticate users against a specific repository in your environment. Users who want to access this desktop must be defined in the repository. In this task, you will log in to the ICN admin desktop and check some of the security features that control access to FileNet P8 assets.

- In the **Mozilla Firefox** browser, click the **ICN Admin** bookmark or enter the following URL: <http://vclassbase:9081/navigator/?desktop=admin>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.

The ICN admin desktop opens.

On the **Desktops** tab, the available desktops for this ICN instance are listed. From this admin client, you can configure all the ICN features for your desktops.

- Click **Repositories** from the left navigation pane.
- From the **Repositories** tab on the right pane, notice the list of repositories.

The Server Type column shows that all these repositories are of IBM FileNet Content Manager type. You can also configure other type of repositories. You must configure a FileNet P8 object store in this tab by using the Server URL to be able to access the content for that object store.

- Close the **Repositories** tab.
- On the **Desktops** tab, select **Sample** and click **Edit**.

This is the Sample Desktop that you were using for the earlier activities.

- On the **Sample** tab > **General** subtab, scroll down and then verify that **LoanProcess** repository is listed under the **Authentication** section.

Desktop: Sample

General	Repositories	Layout	Appearance
<b>▼ Authentication</b> * Repository: <b>LoanProcess</b>			
Limit access to specific users and groups: <input type="radio"/> Enable <input checked="" type="radio"/> Disable			

When users log in to Sample desktop, ICN authenticates the users against the LoanProcess object store. If the user does not have access to this object store, the access to the ICN desktop is denied.

- On the **Sample** tab, select the **Repositories** subtab and observe the list of repositories.

Recall that these repositories were displayed on the Sample desktop in the previous tasks and authorized users were able to access content.

You can learn more on configuring repositories and desktops in the IBM Content Navigator courses.

- Log out of IBM Content Navigator and then close the browser.

## **Observe object store access.**

Object stores are usually secured by using group memberships. Users who have access to object stores can log in and use the object stores. Each user, depending on their role, has access to some but not necessarily all the object stores in an IBM Content Navigator (ICN) desktop. In this task, you will sign in as Mary and verify that Mary is able to access the LoanProcess object store but not the other object stores that are available in the ICN desktop.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>.
- Type **Mary** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Verify that Mary is able to access the folders and documents in the **LoanProcess** object store.
  - Double-click the folders in the right pane to open them.  
You can also click the folders from the left navigation pane.
- To open another repository, click the down arrow next to **LoanProcess** on the upper right.

All the repositories that are available for this desktop are shown in the list: LoanProcess, Sales, LoanProcessQA, and SalesQA

  - Attempt to open each of the object stores in the list by clicking it and verify that Mary is denied access to the other repositories.
- Log out of IBM Content Navigator and then close the browser.

# Activity: Explore the security settings in ACCE

In this activity, you will explore some of the security concepts that you learned earlier in this course. You will log in as the user P8Admin who has been given full access to the objects in the IBM FileNet Content Manager repositories. This user has already been created and configured on the student system to complete these activities.

In this activity, you will accomplish the following:

- Check the security settings.

## Check the security settings.

In this activity, you will log in to Administration Console for Content Platform Engine (ACCE) and check the security settings.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and then click the **LoanProcess** object store.
- From the **LoanProcess** tab, on the left pane, expand the **LoanProcess > Browse > Root Folder** node and then click **Loans**.
- From the **Loans** tab on the right pane, click any document (Example: **J Jones' Loan**)
- From the **J Jones' Loan** tab, select the **Security** subtab.

Use the forward arrow on the right to scroll to find the tab. You can also use the down arrow to select the subtab from the list.

If the contents of the tab is not displayed, click Refresh and the content will be refreshed.

In the Security subtab, under the Access Permissions section, each row with a security user or group name is an Access Control Entry (ACE). All the rows collectively form the Access Control List (ACL) for the document.

Notice that the ACEs are editable. If you select a row in the list, the Edit and Delete buttons are enabled.

Observe that each row has the value Direct for the Source column. It indicates that the security source is Direct Instance Security.

- From the **J Jones' Loan** tab, select the **General** subtab, scroll down, and observe the **Inherit Security from folder** field.  
If a value is assigned to this field, it indicates the folder object (security parent) from which this document inherits security.  
You will learn about security inheritance and other security concepts in a later section.
  - Close the **J Jones' Loan** tab and the **Loans** tab.
  - From the **LoanProcess** tab, on the left pane, collapse the **Browse** node, expand the **Data Design > Classes** node and click the **Document** class.
  - From the **Document** tab on the right pane, select the **Default Instance Security** subtab.  
In the Default Instance Security subtab, the ACL list that is under the Access Permissions section, will become the default security for the documents that belong to this Document class.
- Log out of the administration client and close the browser.

# Activity: Change direct security of an object

When you first create an object, typically, it acquires the default security settings that is defined for the class. These settings identify which users and groups can access the object. The default security for an object can also be determined by other sources such as an entry template, a security policy, folder inheritance, and so on.

In IBM Content Navigator, you can specify security on a document by using the following predefined security roles: Owner, Author, Reader, and No access. Each of these groups has a predefined set of access rights.

The list of available security settings is different in IBM Content Navigator (ICN) as compared to Administration Console for Content Platform Engine (ACCE). ICN presents some aggregations of security settings to give end users a more intuitive set of options, whereas ACCE provides a much more granular set of options.

In this activity, you will create a document and observe its default instance security. You will then modify its security directly for the group access, access level, and ownership in IBM Content Navigator.

In this activity, you will accomplish the following:

- Add a folder and a document.
- Verify access to the document by a different user.
- Remove group access to the document.
- Verify that access is removed.
- Change access level.
- Change ownership.
- Verify the change in ownership.
- Examine the ownership.

## Add a folder and a document.

Mary and Matt are the members of the Loan Managers group. In this task, you will log in as the user Mary, create a folder and a document, and check who has access to the newly created items.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>.
- Type **Mary** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.

- From the **LoanProcess** repository, click **New Folder** from the toolbar.
- On the **New Folder** page, type **Security Test** for the **Folder Name** field, observe the default security for the folder, and then click **Add**.
- Back on the **Browse** page, double-click **Security Test** to open the folder and then click **Add Document** from the toolbar.
- On the **Add Document** page, type **Access Loan** for the **Document Title** field.
- For the **What do you want to save?** field, click **Browse**.
- On the **File Upload** page, navigate to the **C:\Training\F2810G\SampleDocs** folder, select any file (Example: **MarketingPlan5.pdf**), and then click **Open**.
- In the **Add Document** page, leave the default for all the other fields and observe the security that is assigned to this document.

The Owner group has the following members: P8Admin, P8Admins, and Mary

The Readers group has the following members: Loan managers, Loan officers, Loan processors, and Loan underwriters

- Click **Add** and then, on the **Browse** page, verify that the new document is listed.
- Click the head and shoulder icon in the banner, click **Log Out** to log out of **IBM Content Navigator** and then close the browser.

For all the following tasks, when you log out as one user and before signing in as another user, close the browser to avoid any caching issue.

## **Verify access to the document by a different user.**

Since Matt is a member of the Loan managers group which is authorized to view the document created in the previous task, Matt should be able to access the document that Mary created. In this task, you will verify the access by logging in as Matt.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>.
- Type **Matt** for **User name**, **FileNet1** for the **Password** field, and then click **Log In**.
- From the **LoanProcess** repository, double-click the **Security Test** folder to open it and then verify that you can access the **Access Loan** document.

- Right-click the document and then verify that user **Matt** has access to open, preview, properties, or download the document (these actions are enabled) but he cannot delete this document (action is grayed out) since he is not the owner of this document.

Matt also cannot check out the document because the Loan managers have only Reader access. In a later task, you will change Matt to be the owner of the document.

- Log out of IBM Content Navigator.

## Remove group access to the document.

In your business scenario, you determine that the Loan processors group no longer needs access to your document. In this task, you will verify that Peter who is a member of the Loan processors group is able to view the document. You will then remove the Loan processors group access to the document and verify that Peter can no longer access the document.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>.
- Type **Peter** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- From the **LoanProcess** repository, open the **Security Test** folder and then verify that the **Access Loan** document is displayed.
- Log out of **Sample Desktop** and close the browser.
- Log in to the **Sample Desktop** as **Mary** (Password: **FileNet1**).
- Open the **Security Test** folder, right-click the **Access Loan** document and then select **Properties**.
- On the **Properties** page, open the **Security** tab.
- Remove the permission for **Loan processors** to read the document by clicking the **X** on the group and then click **Save**.
- Log out of IBM Content Navigator and close the browser.

## Verify that access is removed.

User Mary has removed access to the document for Loan processors. You will log in as Peter and verify that he is not able to access the document.

- Log in to **IBM Content Navigator Sample Desktop** as **Peter**:
  - **Sample Desktop** bookmark or URL: <http://vclassbase:9081/navigator>
  - User name: **Peter**
  - Password: **FileNet1**
- From the **LoanProcess** repository, open the **Security Test** folder and then verify that the folder is empty.  
This security configuration is an example of an implicit denial. When a user has no permissions (not listed in the ACL), the document is not displayed.
- Log out of IBM Content Navigator **Sample Desktop** and close the browser.

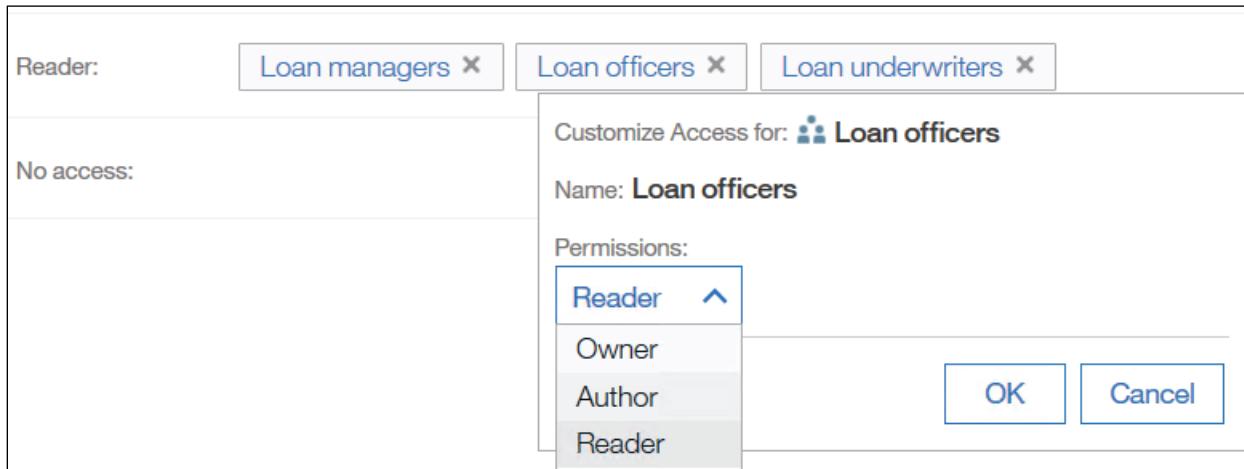
## Change access level.

The members of the Loan officers group have Reader access to the document, by default. You want to grant Loan officers with Authors access for this document. As an owner of this document, Mary can change the access levels.

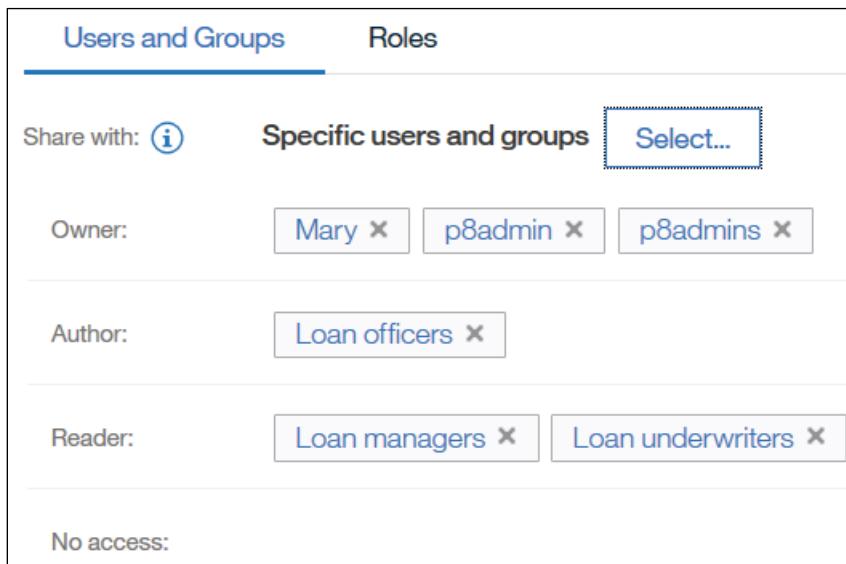
In this task, you will check the Reader access for Olivia who is a member of the Loan officers group. You will grant her group the Author access and then check her access.

- Log in to **IBM Content Navigator Sample Desktop** as **Olivia**:
  - **Sample Desktop** bookmark or URL: <http://vclassbase:9081/navigator>
  - User name: **Olivia**
  - Password: **FileNet1**
- From the **LoanProcess** repository, open the **Security Test** folder.
- Right-click the **Access Loan** document, and then verify that user Olivia has access to open, preview, properties, and download the document (these actions are enabled) but she cannot check out the document (this action is grayed out) because the Loan officers have only Reader access.
- Log out of **Sample Desktop**, close the browser, and then log in as **Mary** (Password: **FileNet1**).

- Open the **Security Test** folder, right-click the **Access Loan** document and then select **Properties** from the list.
- On the **Properties** page, open the **Security** tab.
- Click the **Loan officers** link and then select **Author** from the **Permissions** list.



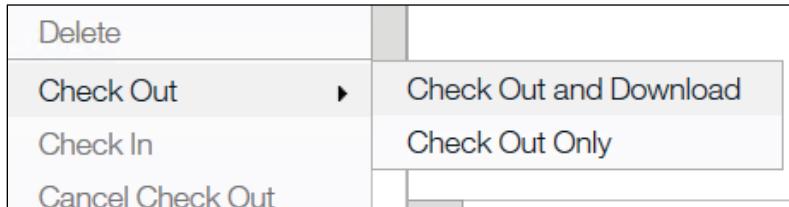
- Click **OK** and then verify that **Loan officers** are now in the **Authors** group.



- Click **Save**, log out of **Sample Desktop** and then close the browser.
- Log in to **Sample Desktop** as **Olivia** (Password: **FileNet1**).

- Open the **Security Test** folder, right-click the **Access Loan** document, and then verify that Olivia now has access to check out the document.

The Check Out action is enabled. Because the Loan officers have been given Author access and Olivia is a member of this group, she is able to access the action.



- Log out of **Sample Desktop** and close the browser.

## Change ownership.

The user Mary is the owner of the document that you created in the earlier task and this user has full access to the document. Mary will no longer be working on this document and she wants to change the ownership to Matt who is also a member of the Loan managers group. You have already checked that Matt does not have checkout or delete access to this document. In this task, you will make Matt the owner of the document, and then recheck his access.

- Log in to IBM Content Navigator **Sample Desktop** as **Mary** (Password: **FileNet1**).
- Open the **Security Test** folder and then open the **Properties** page for the **Access Loan** document.
- On the document's **Properties** page, click the **Security** tab and then for the **Share with** field, click **Select** next to the **Specific users and groups**.
- On the **Add Permissions** page, for the **Search for** field, verify that **Users** is selected, type **Matt**, and then click the Search  icon.
- Select **Matt** from the **Available** pane and move it to the **Selected** pane by using the forward arrow.
- At the end of the page, make sure **Owner** is selected for the **Permissions** field and then click **Add**.
- Back on the **Properties** page, verify that **Matt** is added to the list of Owners.

Owner:	<b>Mary</b> 	<b>p8admin</b> 	<b>p8admins</b> 	<b>Matt</b> 
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- Click the **X** on **Mary** to remove the user from the **Owners** list, and then click **Save**.

- On the **Browse** page, right-click the **Access Loan** document, and then verify that Mary no longer has Owner access.  
Delete, checkout and a few other actions are now disabled. Since she is part of the Loan managers group, she continues to have Reader access through that membership and can open or download the document.
- Log out of **IBM Content Navigator** and close the browser.

## **Verify the change in ownership.**

You changed the ownership of the document to Matt. In this task, you will verify that Matt has full access to the document (including delete).

- Log in to IBM Content Navigator (ICN) **Sample Desktop** as **Matt** (Password: **FileNet1**)
- Open the **Security Test** folder, right-click the **Access Loan** document, and then verify that Matt can now check out, delete, and take other actions (these action are enabled now).
- Log out of ICN **Sample Desktop** and close the browser.

## **Examine the ownership.**

The security that is set on a document in the IBM Content Navigator (ICN) client is executed as configured in ICN. Even though you changed the ownership of the document to Matt, Mary remains the owner when you examine the ownership in Administration Console for Content Platform Engine (ACCE). This is because how ICN maps its security groups (For example, Owner, Author, or Reader). Mary will be able to take owner actions on this document in ACCE even after she is removed as the owner in ICN. An administrator must reset the ownership in ACCE to complete the process. In this task, you will examine this and change the ownership to Matt.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- From the **EDU\_P8** tab, expand the **Object Stores** folder on the left pane and then click the **LoanProcess** object store.
- From the **LoanProcess** tab, expand the **LoanProcess > Browse > Root Folder** node on the left pane and then click **Security Test**.
- From the **Security Test** tab on the right, click the **Access Loan** document link.

- Scroll the tabs to the right and then click the **Security** subtab to open it.
- Scroll down the page to the **Owner/Active Markings** section and then verify that the **Owner** is **Mary** (shown as **mary@edu.ibm.com**).
- Click **Change Owner**.
- On the **Change Owner** page, select the **Change owner to** option, and then click **Find**.
- On the **Add Users and Groups** page, search for **Matt** (by **Short name**).

Search by :	<a href="#">Short name</a>	<a href="#">Starts with</a>	Matt	<a href="#">Search</a>
-------------	----------------------------	-----------------------------	------	------------------------

- Select **Matt** from the **Available Users and Groups** pane and then move Matt to the **Selected Users and Groups** pane by clicking the forward arrow.
- Scroll down, click **OK**, and then verify that Matt (**matt@edu.ibm.com**) is now the owner on the **Access Loan** tab.
- Click **Save**, click **Refresh**, and then click **Close** to close the **Access Loan** tab.
- Close the **Security Test** tab.
- From the **LoanProcess** tab, click **Refresh**.  
This completes the change of ownership at all levels.
- Log out of **Administration Console for Content Platform Engine**, and then close the browser.

# Activity: Customize security access

In Administration Console for Content Platform Engine, you can specify security by using the following predefined Permission groups: Full Control, Minor versioning, Major versioning, Modify properties, View content, View properties, Publish, and Custom.

In this activity, you will use Permission groups for common security scenarios, and specify custom permissions for fine-grained security configurations.

In this activity, you will accomplish the following:

- Add typical document permissions.
- Edit security settings.

## Add typical document permissions.

In this task, you will create a folder and a document. You set security by using the predefined Permission Groups.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- From the **EDU\_P8** tab on the left pane, expand the **Object Stores** folder and click the **LoanProcess** object store.
- From the **LoanProcess** tab, expand the **LoanProcess > Browse** node on the left pane, right-click **Root Folder**, and then select **New Folder**.
- Type **AT Folder** for the **Folder name** field, click **Next** two times, and on the **Summary** page, click **Finish**.
- Click **Close** on the **Success** page.
- Expand the **LoanProcess > Browse > Root Folder** node on the left pane and then click **AT Folder** to open it.
- On the **AT Folder** tab, click **Actions > New Document** from the top toolbar.
- On the **New Document** tab, type **Access Test** for the **Document title** field, verify that the **With content** option is selected and then click **Next**.
- Click **Add** to add a content element, and then click **Browse** to select a document.
- On the **File Upload** page, navigate to the **C:\Training\F2810G\SampleDocs** folder, select a document (For example, **SampleTextDoc1.txt**) and then click **Open**.

- On the **Add Content Element** window, click **Add Content**.
- Back on the **New Document** tab, click **Next** several times, leave the default values, and then click **Finish** on the **Summary** page.
- Click **Close** on the **Success** page.
- On the **AT Folder** tab, click **Refresh**, verify that the new document is listed, and then click the **Access Test** link.
- On the **Access Test** tab, scroll to the **Security** subtab.
- On the **Security** subtab, click **Add Permissions > Add User/Group Permission**.
- On the **Add User and Groups** page, type **Case** on the **Search by** field and then click **Search**.
- Select **Case workers** from the **Available Users and Groups** pane and then move to **Selected Users and groups** by clicking the forward arrow.

Search by :	Short name	Starts with	Case	<b>Search</b>
<b>Search Results</b>				
<b>Available Users and Groups</b>		<b>Selected Users and Groups</b>		
#AUTHENTICATED-USERS #CREATOR-OWNER #REALM-USERS(EDU_AD)		Case workers		
<input type="button" value="→"/> <input type="button" value="←"/>				

- Select **Case workers** from the **Selected Users and groups** pane, scroll down to the **Permissions** section, and then select **Major versioning** from the **Permission group** list.

<b>Permissions</b>	
Permission type :	Allow
Apply to :	This object only
Permission group :	Full Control
<input type="checkbox"/> Full Control <input type="checkbox"/> Minor versioning <input checked="" type="checkbox"/> Major versioning	

Verify that the following individual permissions are automatically selected:

View all properties, View content, Change state, Major versioning, Read permissions, Unlink document, Modify all properties, Link a document / Annotate, Create instance, and Minor versioning.

- Click **OK**, back on the **Access Test** tab, verify that **Case workers** is listed and then click **Save**.

## Edit security settings.

For this scenario, the Major versioning Permission group grant access to more actions than what you want to grant to the Case workers group. You can control the security at a more granular level by setting custom permissions. In this task, you will modify the permissions to a custom level.

You are already logged on to Administration Console for Content Platform Engine as p8admin. You are viewing the Access Test document's security tab.

- On the **Access Test** tab > **Security** subtab, select the **Case workers** row under **Access Permissions** section and then click **Edit**.
- On the **Edit Permissions** page, under the **Permission group** section, clear the **Unlink document** permission.
- Confirm that the value for the **Permission group** field changes to **Custom**.

Users and Groups :	<input type="text" value="Case workers"/>
Permission type :	Allow
Apply to :	This object only
Permission group :	Custom
<input checked="" type="checkbox"/> View all properties <input checked="" type="checkbox"/> Modify all properties	

- Click **OK** to close the page.
- On the **Access Test** tab > **Security** subtab, click **Save**.
- Log out of **Administration Console for Content Platform Engine** and close the browser.

# Activity: Configure initial object store security

In this activity, you will create an object store and specify initial security on the object store so that all P8 users (but not all authenticated users) can access it. P8 users is a security group that is defined in the Microsoft Active Directory (LDAP -authentication provider) on your student system. You will further configure security on objects within this object store in later activities.

In this activity, you will accomplish the following:

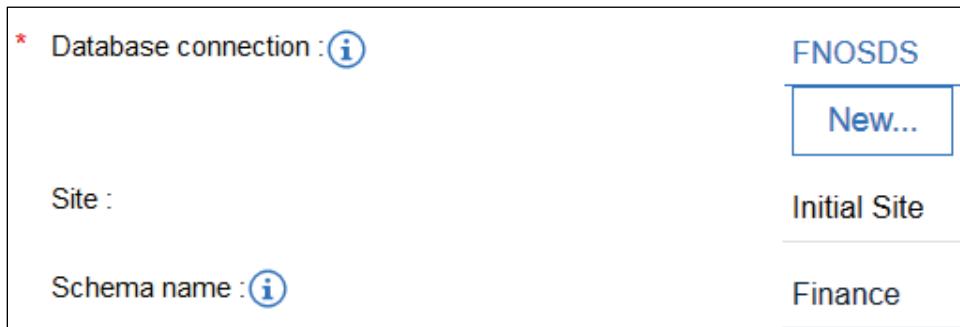
- Create an object store and configure initial security.
- Verify the new object store security.
- Configure your repository.
- Edit the desktop to add your repository.

## **Create an object store and configure initial security.**

You created an object store at the beginning of the course and used it to add other P8 objects. In this task, you will create another object store and use it for the following activities to set various type of security. For more details on this task, refer to the *Create an object store* activity in the beginning of this course.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, click the **Object Stores** node.
- From the **Object Stores** tab on the right pane, click **New**.
- On the **New Object Store** tab, type **Finance** as the value for the **Display name** field and then click **Next**.

- For the **Database connection** field, select **FNOSDS** from the list and then type **Finance** for the **Schema name** field.



Leave the defaults for the other fields.

- Click **Next**, on the **Select the Type of Storage Area for Content** page, click **Next** again.
- On the **Grant Administrative Access** page, click **Add User/Group Permission**.
- On the **Add Users and Groups** page, for the **Search for** field, clear the **Users** and **Special accounts** options (checkboxes), and leave **Groups** selected.
- Type **P8** for the **Search by** field and then click **Search**.
- From the **Search Results** section, select **p8admins** from the **Available Users and Groups** pane and move it to the **Selected Users and Groups** pane by using the forward arrow.
- Click **OK** to close this page, verify that the **p8admins** group is listed on the **Grant Administrative Access** page, and then click **Next**.
- On the **Grant Basic Access** page, click **Add User/Group Permission**, repeat the steps to add the **p8users** group, and then click **Next**.
- On the **Select Add-ons** page, click **Default Application Configuration** and then verify that the add-ons are selected.
- Click **Next**, review your selections on the **Summary** page, and then click **Finish** to create the object store.

Wait for the process to complete. It takes a while.

- On the **Success** page, click **Close**.

## Verify the new object store security.

In this task, you will verify that the object store has correct security settings.

- In the Administrative console, from the **Object Stores** tab, click **Refresh**.
- Click the **Finance** link to open the new object store.
- From the **Finance** tab, click the **Security** subtab and then verify the permission groups for the following security groups and users:
  - P8admins, Full Control
  - P8users, Use object store
  - P8admin, Full Control

	Name	Source	Permission Type	Permission Group
	p8admins	Default	Allow	Full Control
	p8users	Default	Allow	Use object store
	p8admin	Default	Allow	Full Control

The admin users have full control and other P8 users have access to use the object store.

- Log out of the administration console and then close the browser.

## Configure your repository.

Users manage your object store content in the IBM Content Navigator (ICN) client. To be able to access the content, you must first configure ICN to connect to that repository. Then, you must associate this repository with a desktop to enable users to access the content. In this task, you configure the repository that you created in the previous task.

- In the **Mozilla Firefox** browser, click the **ICN Admin** bookmark or enter the following URL: <http://vclassbase:9081/navigator/?desktop=admin>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.

This account has administrative rights.

- From the ICN administration page, click **Repositories** on the left pane. On the Repositories tab, a list of object stores that are already configured is shown.
- To create a connection to your object store, click **New Repository** and then select **FileNet Content Manager** from the list.

- On the **New Repository** tab, enter the following values:
  - Display Name: Finance**  
The ID field is automatically populated.
  - Server URL: iiop://vclassbase:2809/FileNet/Engine**
  - Object store symbolic name: Finance**
  - Object store display name: Finance**
- Scroll down and then click **Connect** to test the connection to the repository.
- On the **Log In** page, type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Click **Save and Close** to save the configuration settings for the new repository.
- On the **Repositories** tab, click **Refresh**, and then verify that **Finance** is listed.

Display Name	ID	Server Type	Server Name
 Finance	Finance	FileNet Content Manager	iiop://vclassbase:2809/FileNet /Engine

This repository is now available to be used for the ICN desktops.

- Close the **Repositories** tab.

## Edit the desktop to add your repository.

In this task, you associate your repository with an ICN desktop. A desktop called **Finance Desktop** is already created for your student system.

- From the **Desktops** tab, select **Finance Desktop** and then click **Edit**. You can also double-click the desktop to open it.
- On the **Finance Desktop** tab > **General** subtab, select the **Finance** repository for the **Authentication** section.

<b>General</b>	<b>Repositories</b>	<b>Layout</b>	<b>Appearance</b>
<b>▼ Authentication</b>			
* Repository: <b>Finance</b>			

When users log in to this desktop, ICN authenticates the users of Finance object store. If the user does not have access to this object store, the access is denied.

This step is very important for all the following activities to work correctly.

- From the **Finance Desktop** tab, select the **Repositories** subtab and verify that the **Finance** and **Sales** repositories are listed for this desktop in the **Selected Repositories** pane.
- If the **Finance** repository is not listed, select **Finance** repository from the **Available Repositories** pane and then click the forward arrow (Add) to move it to the **Selected Repositories** pane.
- On the **Finance Desktop** tab, click **Save** and then select the **Layout** subtab.
- Under the **Displayed features** section, select **Browse**, and then select **Finance** for the **Default repository** field on the right pane.

Feature configuration	
* Default repository:	<input type="text" value="Finance"/>
Repositories:	Repository Name <input checked="" type="checkbox"/> Sales <input checked="" type="checkbox"/> Finance

The default repository (listed under Repository Name) is indicated by an orange star.

- Repeat the steps to define **Finance** as the **Default repository** for the **Search** feature.
- Click **Save and Close** and then click **Close** if you are prompted with the message to refresh your browser.
- In a separate browser tab, click the **Finance Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator/?desktop=FinanceDesktop>
- If you are prompted, type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Verify that the desktop opens with the **Browse** page and **Finance** repository is listed.
- There are no folders or documents at this time. You will be adding the objects and testing the security in the following activities.
- Log out of the ICN desktops and close the browser.

# Activity: Modify root folder security

The security on the Root Folder of an object store determines who can add folders to the top level. Access to the Root Folder is typically restricted. You must restrict Root folder security if you want to maintain control over the top-level directory structure.

The initial security on the object store (that you created in the previous activity) allows all P8users (which includes many Finance security groups that are created for this course) to use the object store. They can currently add documents and top level folders to the root folder. You plan to restrict who can add folders (top folders) at the root level. In this activity, you will grant this permission only to Finance administrators. You will also create top folders for the Finance users to use.

Important: This activity builds on the previous activity, and so ensure that the previous activity is completed.

In this activity, you will accomplish the following:

- Edit Root Folder security.
- Add a folder to your repository for Finance group.
- Verify folder access.
- Examine the security settings.

## Edit Root Folder security.

In this task, you will restrict the root folder access for the P8 users to only view properties and then grant create folder access to Finance Administrators.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** node and then click the **Finance** object store.
- From the **Finance** tab, expand the **Browse** node on the left pane and then click **Root Folder**.
- From the **Root Folder** tab, click **Refresh** and then open the **Security** subtab.
- Under the **Access Permissions** section, select the **P8users** row by selecting the box, and then click **Edit**.

- On the **Edit Permissions** page, notice that the **Permission group** field has **Modify properties** as the value.  
The permission allows them to create subfolders.
- Change the value by selecting **View Properties <Default>**.

**Edit Permissions**

Users and Groups :	p8users
Permission type :	Allow
Apply to :	This object only
Permission group :	View properties <Default>
<input checked="" type="checkbox"/> View all properties <input type="checkbox"/> Modify all properties	

Verify that the permission change removed the create subfolders permission.

- Click **OK** to close the page and then click **Save** on the **Root Folder** tab.  
Verify that the p8users row now has View properties as its permission group.
- Click **Add Permissions**, and then select **Add User/Group Permission**.
- On the **Add Users and Groups** page, for the **Search for** field, clear the **Users and Special accounts** options (checkboxes), and leave **Groups** selected.
- Type **Finance** for the **Search by** field and then click **Search**.
- In the **Search Results** section, select **Finance admins** from the **Available Users and Groups** pane and move it to the **Selected Users and Groups** pane.  
Use the forward arrow.
- Select **Finance admins** on the **Selected Users and Groups** pane, scroll down, and then verify that **Allow** is selected for the **Permission type** field.
- For the **Apply To** field, select **This object only** from the list.
- For the **Permission group** field, select the **View Properties <Default>**, and then select **Create subfolder** to add a custom permission.

- Verify that the **Permission group** field now has **Custom** as the value.

**Add Users and Groups**

Permission type :	Allow	▼												
Apply to :	This object only	▼												
Permission group :	Custom	▼												
<table border="0"> <tr> <td><input checked="" type="checkbox"/> View all properties</td> <td><input type="checkbox"/> Modify all properties</td> </tr> <tr> <td><input type="checkbox"/> Reserved12 (Deploy is deprecated)</td> <td><input type="checkbox"/> Reserved13 (Archive is deprecated)</td> </tr> <tr> <td><input type="checkbox"/> File in folder / Annotate</td> <td><input type="checkbox"/> Unfile from folder</td> </tr> <tr> <td><input type="checkbox"/> Create instance</td> <td><input checked="" type="checkbox"/> Create subfolder</td> </tr> <tr> <td><input type="checkbox"/> Delete</td> <td><input checked="" type="checkbox"/> Read permissions</td> </tr> <tr> <td><input type="checkbox"/> Modify permissions</td> <td><input type="checkbox"/> Modify owner</td> </tr> </table>			<input checked="" type="checkbox"/> View all properties	<input type="checkbox"/> Modify all properties	<input type="checkbox"/> Reserved12 (Deploy is deprecated)	<input type="checkbox"/> Reserved13 (Archive is deprecated)	<input type="checkbox"/> File in folder / Annotate	<input type="checkbox"/> Unfile from folder	<input type="checkbox"/> Create instance	<input checked="" type="checkbox"/> Create subfolder	<input type="checkbox"/> Delete	<input checked="" type="checkbox"/> Read permissions	<input type="checkbox"/> Modify permissions	<input type="checkbox"/> Modify owner
<input checked="" type="checkbox"/> View all properties	<input type="checkbox"/> Modify all properties													
<input type="checkbox"/> Reserved12 (Deploy is deprecated)	<input type="checkbox"/> Reserved13 (Archive is deprecated)													
<input type="checkbox"/> File in folder / Annotate	<input type="checkbox"/> Unfile from folder													
<input type="checkbox"/> Create instance	<input checked="" type="checkbox"/> Create subfolder													
<input type="checkbox"/> Delete	<input checked="" type="checkbox"/> Read permissions													
<input type="checkbox"/> Modify permissions	<input type="checkbox"/> Modify owner													

- Click **OK** to close the page and then click **Save** on the **Root Folder** tab.
- Verify that the **Finance admins** row is added and has **Custom** as its permission group.

Finance admins are now allowed to add subfolders to the Root Folder and they can then specify security on the folders that they create.

- Log out of the administration console and then close the browser.

## Add a folder to your repository for Finance group.

In the previous task, you granted access to the Finance admin group to add subfolders to the Root Folder. In this task, as a Finance admin (Adam), you will create top folders and configure access to users in the various Finance groups. So that the users can add subfolders and documents in the designated folders.

- In the **Mozilla Firefox** browser, click the **Finance Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator/?desktop=FinanceDesktop>
- Type **Adam** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Create a new folder:
  - In the **Finance** repository, click **New Folder** from the toolbar.
  - On the **New Folder** page, type **Invoices** for the **Folder Name** field and click **Add** on the lower right to create the folder.
  - Back on the **Browse** page, verify that your new folder is listed.

- Add **Finance** groups to the folder permissions:
  - Right-click the **Invoices** folder and then select **Properties**.
  - Open the **Security** tab, check the security details, and then click **Select** under the **Users and Groups** subtab.
  - For **Search for** field, select **Groups** from the list and then search for **Finance** groups.

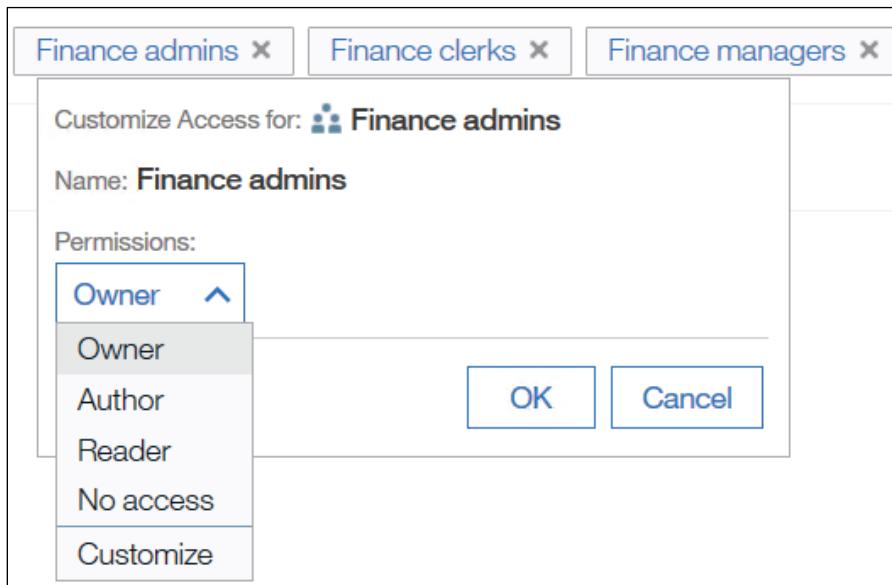
Verify that the search returns the following four groups: Finance admins, Finance clerks, Finance managers, and Finance reviewers

- From the **Available** pane, select all **Finance** groups by holding the shift key and selecting the first and last groups.
- Click the forward arrow to move the groups to the **Selected** pane.
- For the **Permissions** field at the end of the page, select **Reader** from the list and then click **Add**.

The list of available security settings is different in IBM Content Navigator (ICN) as compared to Administration Console for Content Platform Engine (ACCE). ICN presents some aggregations of security settings to give end users a more intuitive set of options, whereas ACCE provides a much more granular set of options.

In the following steps, you will edit the permissions for each group.

- Click the **Finance admins** link, select **Owner** from the list for the **Permissions** field, and then click **OK**.



- Click **Finance clerks**, select **Customize** from the **Permissions** list, and then click **Advanced**.
- Select **Create subfolders** and then clear the **Add to folders** permission.

<input checked="" type="checkbox"/>	Create subfolders	<input type="checkbox"/>
<input type="checkbox"/>	Add to folders	<input type="checkbox"/>
<input checked="" type="checkbox"/>	View properties	<input type="checkbox"/>

- Review the **Finance clerks** permissions and then click **OK**.  
The Finance clerks group has a diamond icon to indicate that it has custom permissions.
- Use the following data to configure permissions for the remaining Finance groups:
  - Finance managers: **Customize - Create Subfolders, Add to folder**
  - Finance reviewers: **Author**

Properties		Security
<a href="#">Users and Groups</a> <a href="#">Roles</a>		
Share with:	<a href="#">(i)</a>	<b>Specific users and groups</b> <a href="#">Select...</a>
Owner:	<input type="button" value="Adam X"/> <input type="button" value="Finance admins X"/> <input type="button" value="p8admin X"/> <input type="button" value="p8admins &gt;"/> <input type="button" value="◆ Finance clerks X"/> <input type="button" value="◆ Finance managers X"/>	
Author:	<input type="button" value="Finance reviewers X"/>	
Reader:	<input type="button" value="p8users X"/>	
No access:		

- Verify the completed folder permissions and then click **Save**.
- Log out of ICN **Finance Desktop** and then close the browser.

## Verify folder access.

In the previous task, you created a top-level folder called Invoices and granted access to the members of the Finance clerks group to create subfolders under the Invoices folder. In this task, you will log in as a member of Finance clerks (Carol) and create a subfolder under the Invoices folder to verify the access.

- In the **Mozilla Firefox** browser, click the **Finance Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator/?desktop=FinanceDesktop>
- Type **Carol** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Expand the **Finance** repository on the left pane, click **Invoices**, and then click **New Folder** from the toolbar.
- On the **New Folder** page, type **Carol** for the **Folder Name** field and click **Add** in the lower right to create the folder.
- Back on the **Browse** page, verify that your new folder is listed.  
Finance clerks group, to which Carol is part of, has permission to add subfolders.
- Log out of ICN **Finance Desktop** and then close the browser.

## Examine the security settings.

As an administrator, you can check the folder security settings in the Administration Console.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **EDU\_P8 > Object Stores** node and then click the **Finance** object store.
- From the **Finance** tab, expand **Browse > Root Folder** on the left pane and then click the **Invoices** folder.
- From the **Invoices** tab on the right pane, click **Refresh** and then open the **Security** subtab.  
If the Security tab is not shown, scroll to the side to find the Security tab.
- Scroll down and then under the **Owner/Active Markings** section, observe that the user Adam (adam@edu.ibm.com) is the owner.

- Scroll up, under the **Access Permissions** section, select **Finance admins** by selecting the checkbox and then click **Edit**.
- In the **Edit Permissions** page, inspect the permissions.

The Owner permissions that you assigned in IBM Content Navigator for the Finance admins group is considered as custom access when we view it in ACCE because some of the inherited permissions were not be assigned to the Finance admins group.

If you check the permissions for P8admins group (or for Adam who created this folder and is a member of the Finance admins security admin group), they have complete permissions including the inherited ones. This is because the P8admins group was assigned to the Object store where this folder is created and the user Adam is the owner of this folder.

- Click **Cancel**.

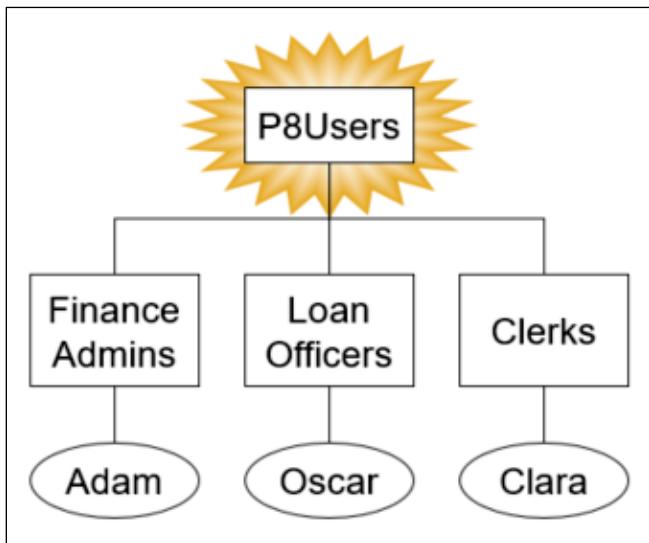
Optionally, you can inspect the permissions for the other Finance groups in ACCE and compare them with the ones that you assigned in ICN.

- Log out of administration console and close the browser.

## Use super groups to configure security

There are situations where you want to add a new security user, group, or admin to an existing object store. The best practice is to setup user groups (instead of individual users) to define security on the object store when it is created. In this way, if you want to add a new user, you can add the user to the LDAP group.

A super group is an LDAP group to which you grant default object store access. The advantage of using a super group, when you create the object store, is that it is easy to give new users access to the object store later. If the LDAP directory allows nested groups, you can add the new group to the super group to provide access to the object store.



In the above diagram, users (Adam, Oscar, and Clara) belong to different groups (Finance Admins, Loan Officers, and Clerks). All the groups are members of the P8Users super group. In this scenario, when you create an object store, you can add P8Users as the super group with default access rights. When new users or groups such as Clerks must be added to an object store, you can add them to P8Users. Users then automatically have default access to all existing objects on the object store.

If you use the same super group on multiple object stores, you can grant immediate access to all object stores by adding a user or group to the super group. Otherwise, you can create a separate group for each object store to provide more specific access.

If you use separate groups for each object store, you can also create separate IBM Content Navigator desktops. Each desktop might then use a separate object store for authentication.

If you add the #Authenticated Users security group to an object store, it give access to all of the LDAP users. By creating a super group, you can control the users who can have access.

---

# Activity: Add groups to an object store by using a super group

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If you add security groups to the object store when it is created, those groups have default access to all objects on the object store (depending on their level of access). Users who are added to the object store later do not automatically get the same permissions on the existing objects. To grant permissions on the existing objects, you can add new users or groups to a super group or use other methods such as run the security script wizard. In this activity, you will use super groups.

Important: This activity builds on the previous activities under the Security topics, and so ensure that the previous activities are completed.

A group called p8users is already created in Active Directory on your student system to be used as a super group.

In this activity, you will accomplish the following:

- Preparation: Add some documents.
- Check a security group before adding it to a super group.
- Add a group to the P8users group.
- Test the access to the existing objects.

## Preparation: Add some documents.

In this task, you will log in to the IBM Content Navigator (ICN) desktop as P8admin, add a folder and some documents. So that they are available to test the access in the following tasks.

- In the **Mozilla Firefox** browser, click the **Finance Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator/?desktop=FinanceDesktop>
- Type **P8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Expand the **Finance** repository on the left pane, click **Invoices**, and then click **New Folder** from the toolbar.
- On the **New Folder** page, type **SampleDocs** for the **Folder Name** field and click **Add** in the lower right to create the folder.
- Back on the **Browse** page, double-click **SampleDocs** to open the folder.

- In **Windows Explorer**, browse to the **C:\Training\F2810G\SampleDocs** folder, select a few documents, and then drag them into the ICN Desktop **SampleDocs** folder.

The **Add Documents** page opens.

- In the **Add Documents** page, click **Add**.
- Back on the **Browse** page, verify that the documents are listed under the **SampleDocs** folder.
- Log out of the ICN desktop and close the browser.

## **Check a security group before adding it to a super group.**

Tia is a domain user in the Active Directory and belongs to the **TestGrp** group. Although Tia is an authenticated user, she does not have authorization to access any objects in the object store. In this activity, you will log in as Tia and test the access to the ICN desktop and ACCE.

- In the **Mozilla Firefox** browser, click the **Finance Desktop** bookmark or type the following URL: <http://vclassbase:9081/navigator/?desktop=FinanceDesktop>
- Type **Tia** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Verify that **Tia** is not allowed to log in to the ICN desktop.

IBM Content Navigator Finance desktop uses the Finance object store to authenticate, so users who are not authorized to use the Finance object store will receive an error.

- Close and reopen the **Mozilla Firefox** browser and then click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **Tia** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Try to access different object stores and objects in Administration Console for Content Platform Engine.

Although this domain user can log in to the administration console, Tia has very limited read-only access to the object stores and objects, and cannot perform any actions.

- Log out of Administration Console for Content Platform Engine and close the browser.

Adding Tia to the Finance object store directly will provide only basic access to the object store but not to any of the existing objects. You will check this access in the following steps.
- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** node and then click the **Finance** object store.
- From the **Finance** tab on the right pane, click the **Security** subtab, click the **Add Permissions**, and then select **Add User/Group Permission**.
- On the **Add Users and Groups** page, for the **Search for** field, clear the **Groups** and **Special accounts** options (checkboxes), and leave **Users** selected.
- Type **Tia** for the **Search by** field and then click **Search**.
- In the **Search Results** section, select Tia from the **Available Users and Groups** pane and move it to the **Selected Users and Groups** pane.

Use the forward arrow.
- Scroll down and verify that the **Permission type** field has **Allow**.
- For the **Apply to** field, select **This object and all children** from the list.
- For the **Permission group** field, select **Use Object Store** from the list and then click **OK** to close this page.
- Verify that **Tia** is listed with the permission that you selected, click **Save** to save the changes and then click **Refresh**.
- Log out of the administration console and close the browser.
- In the **Mozilla Firefox** browser, click the **Finance Desktop** bookmark or type the following URL: <http://vclassbase:9081/navigator/?desktop=FinanceDesktop>
- Type **Tia** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Notice that you get an error message and it is different from the one that you got before adding Tia to the object store.

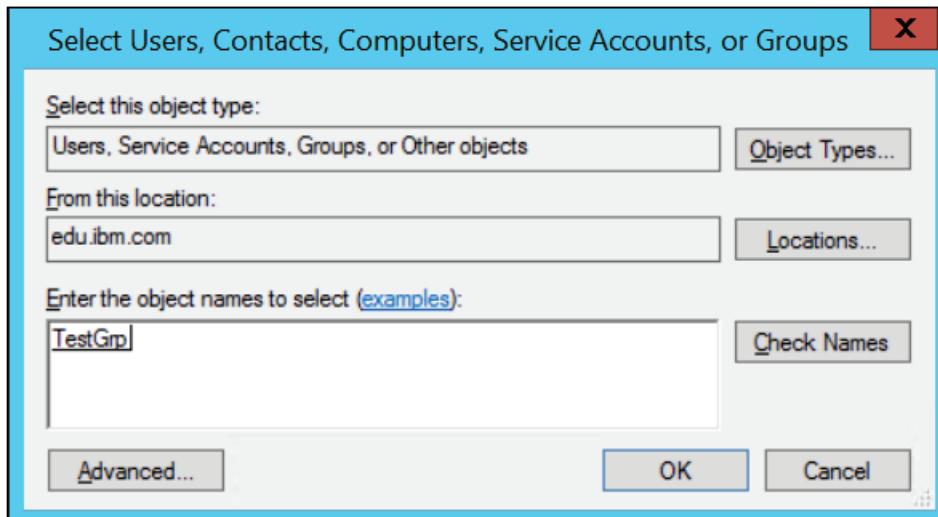
- Click **Close** when you are prompted with the message: You don't have the appropriate permissions to access the object store.
- Verify that the **Browse** page opens, but the user cannot view the existing folders or any objects.
- Log out of ICN **Finance Desktop** and then close the browser.  
Remove Tia from the Finance object store in the following steps:
  - In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
  - Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
  - On the left pane of the **EDU\_P8** tab, expand the **Object Stores** node and then click the **Finance** object store.
  - From the **Finance** tab, click the **Security** subtab.
  - Under the **Access Permissions** section, select the **Tia** row and then click **Remove**.
  - Verify that **Tia** is not listed on the security list, click **Save**.
  - Log out of the administration console and close the browser.

## Add a group to the **P8users** group.

The easiest way to add users and groups to an object store is to add them to an existing group that already has access. In an earlier activity, you created and configured the Finance object store with the **P8users** group. In this activity, you will add the **TestGrp** group to this super group to instantly provide the default access to the object store and its objects.

- From **Programs**, open the **Administrative tools > Active Directory Users and Computers**.  
You can also use the Active Directory Users and Computers shortcut on the taskbar.
- From the left pane, click **Users**.
- On the right pane, right-click the **P8users** group and then select **Properties**.
- On the **p8users Properties** page, select the **Members** tab and notice that there are already many groups are listed.

- Click **Add**, type **TestGrp** in the **Enter the object names to select** field, and then click **Check Names**.



The **TestGrp** is selected (shown with an underline).

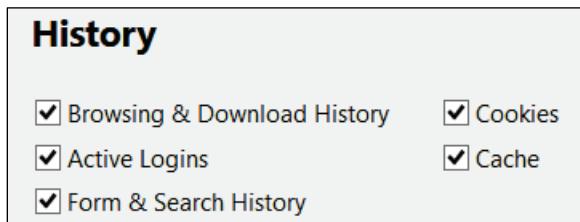
- Click **OK**.
- Back on the **p8users Properties** page, verify that **TestGrp** is added to the **Members** tab and then click **OK**.
- Exit **Active Directory Users and Computers**.

## **Test the access to the existing objects.**

In this task, you will restart the application servers for Content Platform Engine (CPE) and for IBM Content Navigator (ICN) to refresh, clear the browser cache, and test the access to the existing repository objects.

- Restart the application servers in the following steps:
  - On the **Windows** desktop, open the **WebSphere Admin** folder.
  - Right-click **\_3 Stop ICNserver.bat** and then select **Run as administrator**.
  - Click **Yes** if prompted to allow the program to make changes.  
Wait for the command window to close.
  - Right-click **\_4 Stop server1.bat** and then select **Run as administrator**.
  - Click **Yes** if prompted to allow the program to make changes.  
Wait for the command window to close.
  - Right-click **\_1 Start server1.bat** and then select **Run as administrator**.

- Click **Yes** if prompted to allow the program to make changes.  
Wait for the command window to close.
- Right-click **\_2 Start ICNserver.bat** and then select **Run as administrator**.
- Click **Yes** if prompted to allow the program to make changes.  
Wait for the command window to close.
- To clear the **Mozilla Firefox** browser cache, open the browser, click **History > Clear Recent History** from the Tools bar.
- In the **Clear All History** window, select all the options.



- Click **Clear Now**, close the browser and reopen it.
- Click the **Finance Desktop** bookmark or type the following URL:  
**http://vclassbase:9081/navigator/?desktop=FinanceDesktop**
- Type **Tia** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Verify that **Tia** can view the folders and documents in **Finance** object store.
- Click the down arrow next to **Finance** on the upper right and select **Sales** from the list to access the content of that repository.
- Verify that Tia is able to view the folders and documents, log out of ICN **Finance Desktop** and then close the browser.

Since the P8users super group is configured on the Sales object store, Tia is able to access the Sales repository.

# Use the Security Script Wizard

If you add new users to an object store that is already in production, the users have permissions only on the objects that are created after the addition of the users. To provide access to the existing objects to the new users, you can use a super group (and add the new users to the super group) as you learned in the previous section.

If you used individual users (instead of groups) in the initial setup, and now if you want to add a new user to provide access to the existing objects, you will use the Security Script Wizard.

## How does Security Script Wizard work?

When you run the Security Script Wizard, the wizard assigns security roles to user and group accounts for the objects in an object store through a query to your directory service. The wizard:

- provides an interface to select an object store and a security role
- converts the user inputs into JSON data and appends it to the JSON role definition file
- merges the combined JSON data structure with the JavaScript security script
- submits the populated security script to create the security principals for the object store and the objects

## Sample files for the Security Script Wizard

Content Platform Engine provides the following two sample files for use with the Security Script Wizard:

- `UpdateOSSecurity.json`

The JSON file defines the security roles to be assigned and the permissions for the roles. The file also establishes communication between the wizard and the `SecurityScript.js` file.

- `SecurityScript.js`

When you run the Security Script Wizard the first time on a workstation, you must download the sample files to that workstation. You can customize these files.

## Considerations when you use Security Script Wizard

The Security Script Wizard assigns security roles to user and group accounts to create security principals for the objects in an object store, with some exceptions.

The Security Script Wizard:

- sets permissions on the root folder and assigns the security on securable objects
- does not directly modify the security on custom objects, documents, and non-root folders

Therefore, running the Security Script Wizard alone does not affect permissions on custom objects, documents, and non-root folders in the object store. After running the wizard, you can configure security parentage so that the root folder becomes the security parent of any folders, documents, and custom objects that should inherit the new permissions.

- Does not remove or modify existing permissions

Depending upon the number of objects that must be updated, the changes to the object store can take some time.

# Activity: Use the Security Script Wizard

If you need to add a group of users to an object store, and you do not have an established group (like the P8users super group in the previous activity), then you can use the Security Script Wizard. The wizard allows you to assign security roles to user and group accounts to create security principals for the objects in an object store. You must run the Security Script Wizard on each object store to which you are adding the accounts.

Important: This activity builds on the previous activities under the Security topics, and so ensure that the previous activities are completed.

In this activity, you will accomplish the following:

- Check a group before running the Security Script Wizard.
- Download the Security Wizard Script files.
- Run the Security Script Wizard.
- Test object store access.

## **Check a group before running the Security Script Wizard.**

A user, in addition to being a member of the LDAP directory, must have permission (authorization) on the object store (that is used for authentication) in order to log in to an IBM Content Navigator (ICN) client.

Note that if an object store is configured to provide access to the #AUTHENTICATED USERS group, then anyone who can log in to the domain can have access to that object store. The student system does not have this configuration, so only users who have explicit permission can access the object store.

The student system already has a user called Scott who is a verified member in LDAP but does not have permission to access the Finance object store that is used for authentication. In this task, you will check this status out by logging in as Scott.

- In the **Mozilla Firefox** browser, click the **Finance Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator/?desktop=FinanceDesktop>
- Type **Scott** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Verify that Scott cannot log in and get the following error: *You do not have the appropriate permissions to access the following repository: <repository name>*

- Close the browser.

In the following tasks, you will run the Security Script Wizard to include the Script testers group (Scott is a member of this group) and repeat checking Scott's access to the ICN desktop.

## Download the Security Wizard Script files.

You need the script files to run the wizard. In this activity, you will download the files.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- From the **EDU\_P8** tab, expand the **Object Stores** folder on the left pane, right-click the **Finance** object store, and then select **Run Security Script Wizard**.
- Click the **SecurityWizardScript.zip** link.

**Security Script Wizard**

Select a role definition file (JSON file) and a security script (JavaScript file) to assign security roles to users. To see and use sample security scripts, download the [SecurityWizardScript.zip](#) file.

- On the **Opening ...** window, select the **Save File** option, click **OK** to close.
- Back in the administration console, cancel the **Security Script Wizard**, log out and close the browser.
- Open the **Downloads** (`C:\Users\p8admin\Downloads`) folder where the file was downloaded.  
If you cannot download the file for any reason, both the zip file and the extracted files are in the `C:\Training\F2810G\SecurityWizardScript` folder on your student system.
- To extract the **SecurityWizardScript.zip** file, right-click the file, select **Extract All**, and then click **Extract** on the page.
- In the **C:\Users\p8admin\Downloads\SecurityWizardScript** folder, verify that the following files are listed:
  - `SecurityScript.js`
  - `UpdateOSSecurity.json`

## Run the Security Script Wizard.

In this task, you will run the Security Script Wizard again on the object store.

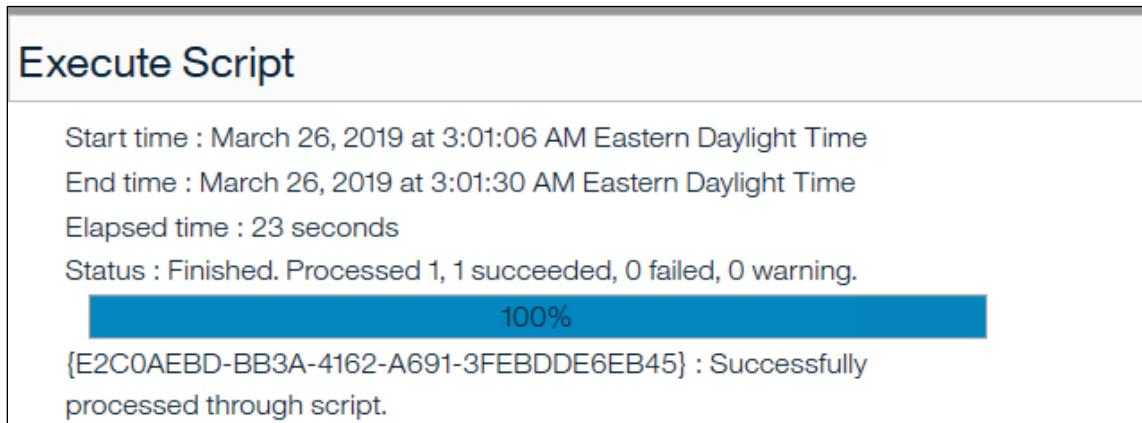
- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- From the **EDU\_P8** tab, expand the **Object Stores** folder on the left pane, right-click the **Finance** object store, and then select **Run Security Script Wizard**.
- On the wizard page, for the **Select a role definition file** field, click **Browse**.
- On the **File Upload** page, navigate to the **C:\Users\Administrator\Downloads\SecurityWizardScript** folder, and select the **UpdateOSSecurity.json** file, and then click **Open**.
- For the **Select a security script file** field, repeat the step to select the **SecurityScript.js** file.

* Select a role definition file : <a href="#">(i)</a>	UpdateOSSecurity.json	<a href="#">Browse</a>
* Select a security script file : <a href="#">(i)</a>	SecurityScript.js	<a href="#">Browse</a>

- Click **Next**.
- On the **Select Role and Role Participants** page of the wizard, verify that **Object Store Users** option is selected, and then click **Add User/Group Permission**.
- On the **Add Users and Groups** page, search for the **Script testers** group, move it to the **Selected Users and Groups pane** and then click **OK**.
- Back on the wizard page, verify that **Script testers** is listed.

Security Script Wizard						
Select Role and Role Participants						
Role : <a href="#">(i)</a>	Participants for the selected role					
<input checked="" type="radio"/> Object Store Users <input type="radio"/> Object Store Administrators <input type="radio"/> Workflow Designer	<a href="#">Add User/Group Permission...</a> <a href="#">Remove</a> <table border="1"> <thead> <tr> <th>Name</th> <th>Distinguished Name/Role Name</th> </tr> </thead> <tbody> <tr> <td>Script testers</td> <td>Script testers@edu.ibm.com</td> </tr> </tbody> </table>		Name	Distinguished Name/Role Name	Script testers	Script testers@edu.ibm.com
Name	Distinguished Name/Role Name					
Script testers	Script testers@edu.ibm.com					

- Click **Next**, click **OK** when you are prompted with the message about unassigned participants, and then click **Finish** to complete the security script wizard.  
A window will display the status. Wait for the script to complete.
- When the **Status** shows **Finished**, verify that there are no errors, and then click **Close**.



- Log out of the administration console, restart the browser, and log back in as **p8admin** (Password: **FileNet1**).
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** node and then click the **Finance** object store.
- From the **Finance** tab, on the right pane, select the **Security** subtab and then verify that **Script testers** is listed under the **Access Permissions** section.

The group has Custom as the value for the Permission Group column.

	Name	Source	Permission Type	Permission Group
<input type="checkbox"/>	p8users	Direct	Allow	Use object store
<input checked="" type="checkbox"/>	Script testers	Direct	Allow	Custom

- From the **Finance** tab, on the left pane, expand the **Browse** node and then click **Root Folder**.
- From the **Root Folder** tab, on the right pane, select the **Security** subtab and then verify that **Script testers** is listed under the **Access Permissions** section.  
The group has Modify properties as the value for the Permission Group column.
- Log out of the administration console and close the browser.

## Test object store access.

You ran the Security Script Wizard to provide default object store access to the Script testers group. You will now log on to the IBM Content Navigator (ICN) desktop as Scott (a member of the Script testers group) and observe the security access.

- In the **Mozilla Firefox** browser, click the **Finance Desktop** bookmark or type the following URL: <http://vclassbase:9081/navigator/?desktop=FinanceDesktop>
- Type **Scott** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Verify that **Scott** is allowed to log in to the ICN **Finance Desktop** and has access to create a top level folder (the **New Folder** action is enabled).

Since the Security Script Wizard sets permissions on the root folder, the Script testers group (Scott) has access to the action. However, the wizard does not directly modify the security on documents and non-root folders, Scott cannot view other existing objects.

After running the wizard, you must configure security parentage so that the root folder becomes the security parent of any folders, documents, and custom objects that should inherit the new permissions. You will learn about setting a security parent in a later activity.

- Click the down arrow next to **Finance** on the upper right and select **Sales** from the list.
- Verify that Scott does not have access to the **Sales** object store and receives an error.

To provide access to the other object stores, you must run the Security Script Wizard on each one.

- Click **Close**, log out of the ICN **Finance Desktop** and then close the browser.

Troubleshooting tips:

If the Security Script Wizard changes are not reflected and if you are not able to access ICN desktop, restart the application servers for Content Platform Engine and for ICN to clear the cache and refresh the system.

- On the **Windows** desktop, open the **WebSphere Admin** folder, stop the two application servers and restart them.
  - On the **Windows** desktop, open the **WebSphere Admin** folder.
  - Right-click **\_3 Stop ICNserver.bat** and then select **Run as administrator**.
  - Click **Yes** if prompted to allow the program to make changes.

- Wait for the command window to close.
- Right-click **\_4 Stop server1.bat** and then select **Run as administrator**.
  - Click **Yes** if prompted to allow the program to make changes.  
Wait for the command window to close.
  - Right-click **\_1 Start server1.bat** and then select **Run as administrator**.
  - Click **Yes** if prompted to allow the program to make changes.  
Wait for the command window to close.
  - Right-click **\_2 Start ICNserver.bat** and then select **Run as administrator**.
  - Click **Yes** if prompted to allow the program to make changes.  
Wait for the command window to close.
- Clear the browser cache and repeat the steps to check the access for **Scott**.

# Configure default instance security

When you create a document, the document automatically gets a set of permissions. These permissions are preconfigured on the document class. This default set of permissions is called Default instance security.

## Characteristics of Default instance security

Default instance security is:

- an access control list (ACL) that is configurable at the class level
- set on the class definition properties page
- used as the source for default security when objects are instantiated
- applied only one time (during the creation of the object)

By default, the creator of an object has Owner access and you can remove #CREATOR-OWNER from the default instance security to override this behavior.

When you change default instance security, you can choose to propagate the change to child classes or not. Changes to default instance security do not affect existing objects. You can use Bulk Operations for updating security on existing objects. Direct security of the object can be modified during or after instantiation.

You will learn about the Bulk Operations in a different section of this course.

## Benefits of Default instance security

Default instance security:

- determines the initial proposed security of an object
- is applied automatically
- is used to enforce consistency in assigning initial security

# Activity: Configure default instance security for an object class

In this activity, you configure default instance security on a document class. Whenever an instance of that class is created, its security is determined by the default instance security.

Important: This activity builds on the previous activities under the Security topics, and so ensure that the previous activities are completed.

In this activity, you will accomplish the following:

- Set default instance security on a new document class.
- Verify default instance security.

## Set default instance security on a new document class.

In this task, you will create a property template and a document class, and set the default instance security. In the earlier activity, you have already practiced adding a property template and a class.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder click the **Finance** object store.
- From the **Finance** tab, expand the **Data Design** node on the left pane, right-click **Property Templates**, and then click **New Property Template**.
- From the **New Property Template** tab on the right pane, type **Invoice Number** for the **Display name** field.  
The Symbolic Name and Description fields are automatically populated.
- Click **Next** and then select **String**, from the list, for the **Data type** field.
- Click **Next** two more times and then for the **Single or multi-value** field, select **Single**, and click **Next**.
- Click **Finish** and then click **Close** on the **Success** page.
- In the **Finance** tab, click **Refresh**.

- Expand the **Data Design > Classes** node on the left pane, right-click **Document** and then click **New Class**.
- In the **New Document Class** tab, type **Invoice** for the **Display name** field. The Symbolic Name and Description fields are automatically populated.
- Complete the wizard by clicking **Next**, **Finish**, and then **Close**.
- In the **Finance** tab, click **Refresh**.
- On the left pane, expand the **Data Design > Classes > Document** node, and then click **Invoice**.
- From the **Invoice** tab on the right pane, click the **Property Definitions** subtab and then click **Add**.
- On the **Add Properties** page, type **Invoice** in the filter to show the property template that you added.
- Select **Invoice Number** and then click **OK** to close the **Add Properties** page.
- On the **Invoice** tab, verify that **Invoice Number** is listed and then click **Save**.  
In the following steps, you will configure the default instance security for the class that you created.
- On the **Invoice** tab, open the **Default Instance Security** subtab.
- Review the ACL list under **Access Permissions**, click **Add Permissions**, and then select **Add User/Group Permission**.
- On the **Add Users and Groups** page, search for **Finance managers**, select it from the **Available Users and Groups**, and move the group to the **Selected Users and Groups** by clicking the forward arrow.
- Select **Finance managers**, scroll down to the **Permissions** section, select **Full Control** for the **Permission group** field, and then click **OK**.
- On the **Invoice** tab, verify that **Finance managers** is listed (with **Full Control** for the **Permission Group** column) and then click **Save**.
- Repeat the steps to add **Finance clerks** with **Major Versioning** for the **Permission group**.
- On the **Invoice** tab, click **Save** to save the Invoice class properties.
- On the **Invoice > Default Instance Security** subtab, select **#CREATOR-OWNER** by clicking the box and then click **Edit**.

- On the **Edit Permissions** page, select **Major versioning** for the **Permission group** field and then click **OK** to close the page.
- Click **Save** on the **Invoice** tab and then click **Refresh**.
- Under the **Access Permissions** section, verify that the **#CREATOR-OWNER** and **Finance clerks** rows now have **Major versioning** as its **Permission Group**.

Class Definition: Invoice				
	General	Properties	Property Definitions	Default Instance Security
<b>Access Permissions</b>				
<a href="#">Add Permissions...</a>	<a href="#">Edit...</a>	<a href="#">Remove</a>		
<input type="checkbox"/> Name	Source	Permission Type	Permission Group	
<input type="checkbox"/> #CREATOR-OWNER	Direct	Allow	Major versioning	
<input type="checkbox"/> Finance clerks	Direct	Allow	Major versioning	
<input type="checkbox"/> Finance managers	Direct	Allow	Full Control	
<input type="checkbox"/> p8admin	Direct	Allow	Full Control	
<input type="checkbox"/> p8admins	Direct	Allow	Full Control	
<input type="checkbox"/> p8users	Direct	Allow	View content <Default>	

- Log out of the Administration console, clear the browser cache, and close the browser.

## Verify default instance security.

In this task, you will log in to the IBM Content Navigator (ICN) desktop as Carol who is a member of Finance clerks, create an Invoice document, and verify the security settings.

- In the **Mozilla Firefox** browser, click the **Finance Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator/?desktop=FinanceDesktop>
- Type **Carol** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Expand the **Finance** repository > **Invoices** folder on the left pane and then click **Carol**.
- Click **Add Document** from the toolbar.
- In the **Add Document** page, for the **What do you want to save?** field, click **Browse**.

- On the **File Upload** page, navigate to the **C:\Training\F2810G\SampleDocs** folder, select any file (Example: **MarketingPlan1.pdf**), and then click **Open**.
- Back on the **Add Document** page, Select **Invoice** for the **Class** field and then edit the text to **Invoice 1** for the **Document Title** field.
- For the **InvoiceNumber** field, type **123**, scroll down and then click **Add** on the lower right.
- Back on the **Browse** page, verify that the new document is listed.
- Right-click the **Invoice 1** document, select **Properties**.
- On the **Properties** page, click the **Security** tab and verify the default instance security settings.

Properties	<b>Security</b>	Versions	Folders Filed In	Parent														
<table border="1"> <thead> <tr> <th>Users and Groups</th> <th>Roles</th> </tr> </thead> <tbody> <tr> <td>Share with: <a href="#">(i)</a></td> <td>Specific users and groups <a href="#">Select...</a></td> </tr> <tr> <td>Owner:</td> <td><a href="#">Finance managers</a> <a href="#">×</a></td> <td><a href="#">p8admin</a> <a href="#">×</a></td> <td><a href="#">p8admins</a> <a href="#">×</a></td> </tr> <tr> <td>Author:</td> <td><a href="#">Carol</a> <a href="#">×</a></td> <td><a href="#">Finance clerks</a> <a href="#">×</a></td> </tr> <tr> <td>Reader:</td> <td><a href="#">Script testers</a> <a href="#">×</a></td> <td><a href="#">p8users</a> <a href="#">×</a></td> </tr> </tbody> </table>					Users and Groups	Roles	Share with: <a href="#">(i)</a>	Specific users and groups <a href="#">Select...</a>	Owner:	<a href="#">Finance managers</a> <a href="#">×</a>	<a href="#">p8admin</a> <a href="#">×</a>	<a href="#">p8admins</a> <a href="#">×</a>	Author:	<a href="#">Carol</a> <a href="#">×</a>	<a href="#">Finance clerks</a> <a href="#">×</a>	Reader:	<a href="#">Script testers</a> <a href="#">×</a>	<a href="#">p8users</a> <a href="#">×</a>
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Reader:	<a href="#">Script testers</a> <a href="#">×</a>	<a href="#">p8users</a> <a href="#">×</a>																

As you configured, the Finance managers have full control along with P8admins. Finance clerks and Carol has Author access. Notice that the document creator (Carol) is not listed as the owner. P8users and Script testers have Reader access.

The list of available security settings is different in IBM Content Navigator (ICN) as compared to Administration Console for Content Platform Engine (ACCE). ICN presents some aggregations of security settings to give end users a more intuitive set of options, whereas ACCE provides a much more granular set of options.

- Click **Cancel**, log out of ICN **Finance Desktop**, and then close the browser.

# Set modification access required property

Custom properties of an object can be independently secured. To be able to modify a property, a user generally needs Write access to the property. Content Platform Engine provides more options to control the required access rights to edit custom properties.

## Modification Access Required (MAR) property

The property sheets of all property templates have a MAR page that contains a list of access rights. By default, these access rights for all property templates are cleared. If left cleared, then the property template has no modification access behavior and normal property security applies. However, if you select one or more access rights, properties based on the property template will have different security than normal.

For example, if you select Delete access rights for the MAR property, only users who can delete the object can modify that property value.

You can configure property modification security on two levels:

- Property template (affects all classes that use it)
- Property definition of an object class (only affects all instances of a class)

Changes to a property template affect only classes to which you add the template after the change. If you want to change the property modification access on an existing class, you must change the property definition on that class.

If a property is defined to use this additional security layer, users who add documents are still able to set the values during the addition of the document. However, after the document is added, the property is read-only for them. To ensure that properties are not settable when the document is initially added, use an entry template. Entry templates can be configured in IBM Content Navigator.

Property modification access behavior is primarily intended for IBM Enterprise Records. It is available for use by non-records management applications that need granular control over user ability to modify properties.

## System property modification

Even administrators cannot normally modify certain system properties such as Creator, DateCreated, LastModifier, and DateLastModified. To modify these properties, an administrator needs the Modify certain system properties permission on the object store.

The permission to modify certain system properties is typically needed only in specific scenarios such as setting up a change preprocessor or importing data by using FileNet Deployment Manager.

# Activity: Configure property modification access

Finance clerks can currently edit the value of the InvoiceNumber property of any Invoice that they create. You want only users who have Full Access (including the Delete permissions) to the Invoice documents to be able to change this property. You can customize the modification access for the property to accomplish this goal.

Important: This activity builds on the previous activities under the Security topics, and so ensure that the previous activities are completed.

In this activity, you will accomplish the following:

- Check the access before property modification access.
- Set property modification access.
- Verify property modification restriction.

## Check the access before property modification access.

In a previous activity, Carol, who is a member of the Finance clerks group, created a document. The Finance clerks group does not have delete access for the document. In this task, you will test the access by logging in as Charles who is also a member of the Finance clerks group and edit a property for a document.

- In the **Mozilla Firefox** browser, click the **Finance Desktop** bookmark or type the following URL: <http://vclassbase:9081/navigator/?desktop=FinanceDesktop>
- Type **Charles** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the **Browse** page, expand **Finance > Invoices** and then click the **Carol** folder.
- Right-click the **Invoice 1** document, verify that the **Delete** action is disabled (the action is grayed out and not selectable) and then select **Properties** from the list.
- Edit the value of the **InvoiceNumber** property (For example: **100**) and for the **Document Title** (For example: **Invoice New**) and then click **Save**.
- On the **Browse** page, verify that the document has the new values that you edited.

The title in the middle pane is updated. When you select the document (single-click), you can view the properties of the document on the right pane under Properties section.

You have confirmed that, by default, the Finance clerks group has access to modify the properties and does not have Delete access to this document.

- Log out of ICN **Finance Desktop** and then close the browser.

## Set property modification access.

If you configure the modification access on a property template, it will apply to all the object classes that includes the property template. But if you modify the settings on a property definition of a document class, the property template is unchanged and the modification only applies to that particular document class. In this task, you will configure the modification access on a property definition of a document class.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder click the **Finance** object store.
- From the **Finance** tab, expand the **Data Design > Classes > Document** and then click **Invoice**.
- From the **Invoice** tab on the right, select the **Property Definitions** subtab and then click the **InvoiceNumber** link.
- On the **Property Definition** page, open the **Modification Access** tab and then observe that all the access rights on the Modification Access page are left unselected.

This indicates that there is no Modification Access Required (MAR) behavior and normal property security applies.

- Select the **Delete** option, and then click **Save**.

This setting defines the MAR behavior and in this case, only the users with Delete access can modify the properties.

- Click **Save** to save the **Invoice** class definition.
- Log out of the administration console, clear the browser cache, and close the browser.

## Verify property modification restriction.

In this task, you will test the modification access by logging in as Charles who is a member of the Finance clerks group.

- Repeat the steps in the *Check the access before property modification* access task to log in to ICN **Finance Desktop** as **Charles**, browse to the **Invoice New** document, and then open the **Properties** page.
- Verify that you cannot edit the value of the **InvoiceNumber** property, even though you can edit the **Document Title** by trying to change these values.
- Click **Cancel**, log out of ICN **Finance Desktop**, and then close the browser.

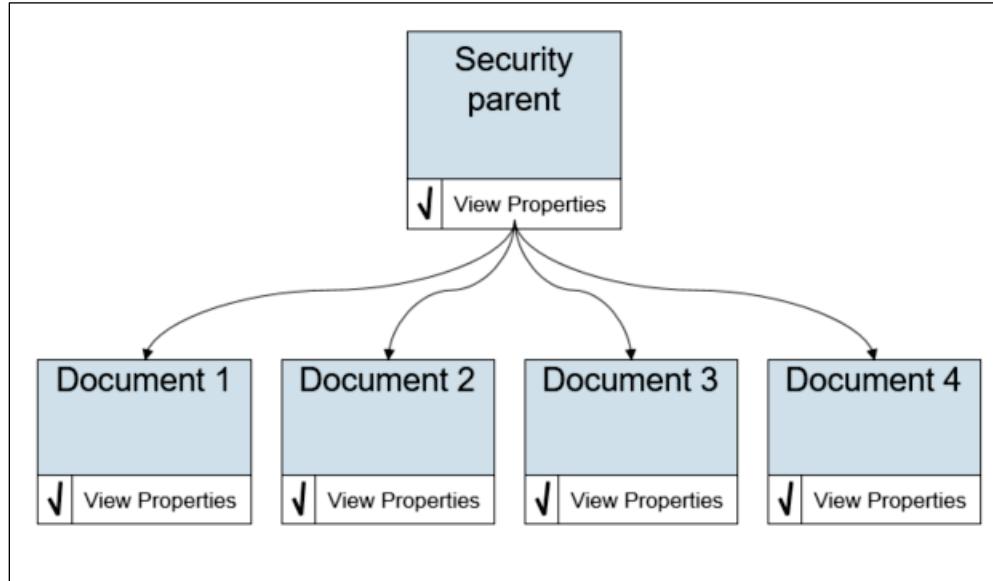
You configured the **InvoiceNumber** property definition on the **Invoice** document class, but you did not change the **InvoiceNumber** property template. If you create a new class and you use this property template, the property will have normal modification access. The configuration change you made applied only to the **Invoice** class.

# Configure security inheritance

You can configure security to be inherited from other objects. Inherited security is a customizable mechanism and a convenient way to control security on multiple objects from a single point.

## Overview of security inheritance

If you specify a security parent for a large group of documents, then you can change permissions on all of these documents by updating the security parent.



In an example scenario, your company has thousands of Invoice documents. A corporate decision mandates that Invoice documents can be viewable by all Finance Clerks. You add Finance Clerks to the security parent for the entire Invoice document class. The new permission is inherited by all Invoice documents. With one change, you gave Finance Clerks access to all Invoice documents.

## Definition of terms

**Security inheritance**

Security inheritance refers to the passing of permissions from a parent object to a child object.

**Inheritable depth**

A property that determines whether permissions are not to be inherited, inherited only by objects that are immediate children, or inherited by all children

**Security parent**

Any object from which another object inherits security

## Security folder

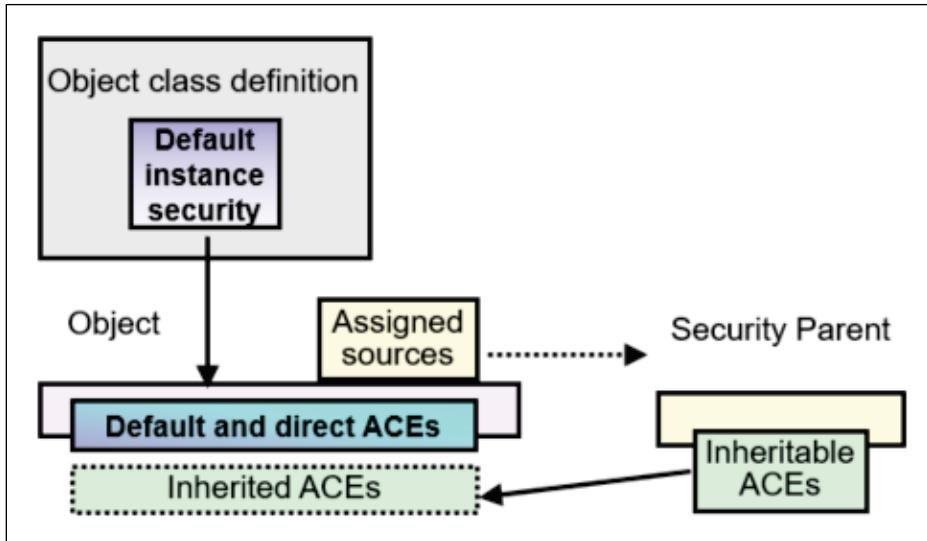
A folder that is used to provide the security for child documents to inherit

## Security proxy

An object that is used to provide the security for other objects to inherit

## Security inheritance architecture

An object's security is a combination of its default instance security, direct ACEs, and the ACEs from the security parent.



This diagram illustrates how inherited ACEs are applied to an object:

- The object class definition has default instance security. When an object of that class is created, the default instance security of the class applies.
- In addition to direct ACEs, the object can inherit permissions from a parent object. Inherited permissions are added to existing permissions.
- If you use Denials, direct permissions are evaluated first, then inherited permissions.

When security changes on a security parent, the changes are not immediately reflected on the objects that use the parent as a security source (that is, their ACLs do not change) for performance reasons. Inherited security is computed when the object is accessed. Waiting to check the inherited security until the last step in the process is much more efficient than updating all of the security children each time a security parent is updated.

## Characteristics of inherited permissions

The following list shows the characteristics of the inherited permissions:

- If you change inheritable permissions on a security parent, it changes permissions on all versions of a security child.
- You cannot directly modify inherited permissions on the child object.
  - The permissions must be modified on the security source object.
  - Inherited permissions are displayed as disabled (for editing) in security interfaces.
- If you delete a security parent, the inherited permissions are removed from the child objects.

## Methods for configuring security inheritance

The following two methods are available for setting up security inheritance in an object store:

- Security folder
  - The security folder method uses folders to set security on objects
  - Inheriting objects have one folder as the security parent
  - The security folder property is set on the inheriting object
- Security proxy
  - The security proxy method can use any class of object as a security parent
  - Inheriting objects can have multiple security sources of this type
  - The security proxy type property is set on the inheriting object

## Use a security folder

You can set the security folder property in one of the following ways:

- Inherit security from folder

The inherit security from folder method requires that the object is filed in that folder, but does not require that you copy the object reference.

- Security folder

The security folder property method requires you to copy and paste an object reference, but does not require that the object is filed in that folder.

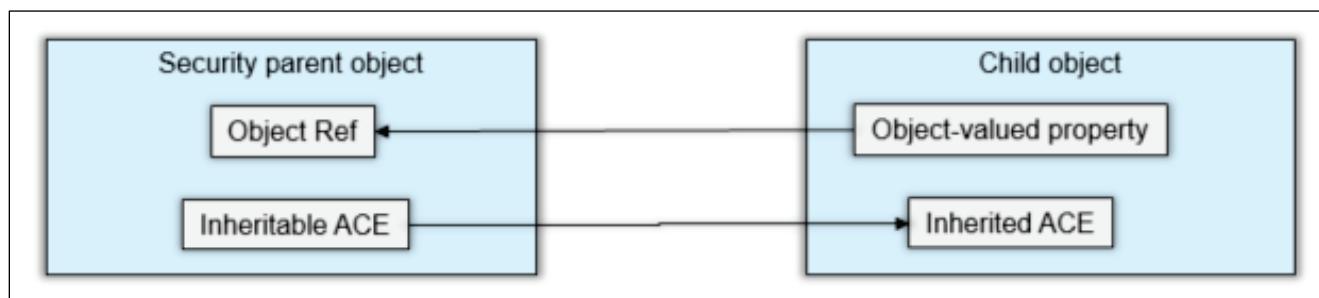
Folder security inheritance can be automated by using a custom application and the Security Folder property value can be assigned to documents automatically.

Following are the consequences of deleting folders or moving child objects:

- If a security folder is deleted, those documents that had that folder as their security parent in the object store no longer have a setting for security folder. They can be reassigned to another security folder.
- If an object that has a security parent is moved out of that folder, the security parent relationship is maintained.

## Use an object as a security proxy

This method is more complex than using the security folder method, but it provides more flexibility. You can specify as many security parents as you need, and the security sources are not limited to being folders. For some business applications, the freedom to use other objects besides folders might allow for a more natural and simpler solution. This method can also be combined with the security folder method so that the final security on an object includes the inherited security from all sources.



The following are the high-level steps to create a security proxy:

- Create a security parent object with inheritable permissions
- Create a custom object-valued property (OVP)
  - Single-valued
  - Security proxy type is inherited
- Add a custom property to the child class
  - For required class, select the exact class of the parent object
- Assign the security parent in one of these ways:
  - Specify the value of the OVP on the child object
  - Specify the default value of the OVP on the child object class

When the security parent object is deleted, the inherited security is removed from the object.

### Example scenario

A legal requirement exists for contracts that are used in the Finance department. From time to time, contracts must be viewable by auditors, who do not usually have access to the contracts. You want to be able to change the security on all of the contracts to allow auditors to access them, and then to remove that access when the audit ends.

Many folders act as security sources for the contracts that are filed within them, and other document types are also filed in these same folders and inherit security from them. You do not want to manually change the security on all of the folders, and you do not want the auditors to have access to the other documents that are filed in those folders. Therefore, you cannot change the security on the folders when the auditors need access to the contracts.

You can set up a custom property on a document class so that all contracts have a property that specifies the security proxy from which to inherit security. In this way, you can allow the documents to use their folder as a security parent, and provide an extra level of access that can be disabled or modified when needed.

# Activity: Configure security inheritance

Your business solution requires that the security of some documents must be determined by the security of a folder or another object. In this activity, you will create a folder and use folder inheritance to secure documents.

Important: This activity builds on the previous activities under the Security topics, and so ensure that the previous activities are completed.

In this activity, you will accomplish the following:

- Preparation: Create a document class.
- Create a parent folder.
- Create and configure a document to inherit security.
- Test security inheritance.

## Preparation: Create a document class.

To have security that is completely controlled by inheritance, you must eliminate the default instance permissions. To set up the tasks for this activity, you will create a document class that has no default instance permissions.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder click the **Finance** object store.
- From the **Finance** tab, expand the **Data Design > Classes** node on the left pane, right-click **Document** and then click **New Class**.
- On the **New Document Class** tab on the right pane, type **Receipt** for the **Display name** field and then click **Next**.
- Click **Finish**, and then click **Open** to open the class for editing.
- Open the **Default Instance Security** subtab and then click **Refresh**.
- Under the **Access Permissions** section, select all entries except **p8admin** and **P8admins**, click **Remove**, and then click **Save**.
- Click **Refresh**, verify that only **p8admin** and **p8admins** are listed, and then close the **Receipt** tab.

## Create a parent folder.

In this task, you will create the folder from which the receipts documents inherit permissions, and add inheritable security settings.

- From the **Finance** tab, expand the **Browse** node on the left pane, right-click **Root Folder** and then click **New Folder**.
- On the **New Folder** tab, type **Receipts** for the **Folder name** field, and then click **Next** two times.  
Leave default values for all other fields.
- Click **Finish**, click **Open** to open the class for editing, and then click **Refresh**.
- Open the **Security** subtab for the folder and then click **Add Permissions > Add User/Group Permission**.
- On the **Add Users and Groups** page, search for **Finance**, select **Finance managers** from the **Available Users and Groups** pane, and then move it to the **Selected Users and Groups**.
- Select **Finance managers**, scroll down to **Permissions** section, and then verify that **Allow** is selected for the **Permission type** field.  
If it is not already selected, select **Allow** from the list.
- For the **Apply to** field, select **All children, but not this object** from the list.
- For the **Permission group** field, select **Full Control** and then click **OK**.
- Back on the **Receipts** tab, click **Save** and then click **Refresh**.
- Verify that the **Finance managers** row is listed and shows **Full Control** for the **Permission group** field.
- Repeat the steps to add the **Finance admins** group, and select **Full Control** for the **Permission group** field.
- Click **Save** and then click **Refresh**.

- Verify that the Finance admins and Finance managers groups have full control.

	Name	Source	Permission Type	Permission Group	Apply To
<input type="checkbox"/>	Finance admins	Direct	Allow	Full Control	All children, but not this object
<input type="checkbox"/>	Finance managers	Direct	Allow	Full Control	All children, but not this object
<input type="checkbox"/>	p8admins	Direct	Allow	Full Control	This object only
<input type="checkbox"/>	p8admin	Direct	Allow	Full Control	This object only
<input type="checkbox"/>	p8users	Direct	Allow	View properties <Default>	This object only
<input type="checkbox"/>	Script testers	Direct	Allow	View properties <Default>	This object only

- Leave the administration console open for the next activity.

## Create and configure a document to inherit security.

In this task, you will add a document of the Receipt class and configure it for the security inheritance.

- On the **Receipts** tab, click **Actions > New Document**.
- From the **New Document** tab, type **Test Receipt** for the **Document title** field and then select **Receipt** for the **Class** field.
- Verify that the **With content** option is selected and then click **Next**.

* Document title :	Test Receipt
* Class :	Receipt
<input checked="" type="checkbox"/> With content	

- On the **Document Content Source** page, click **Add** and then click **Browse** on the **Add Content Element** page.
- On the **File Upload** page, navigate to the **C:\Training\F2810G\SampleDocs** folder, select a file (For example, **MarketingPlan1.pdf**), and then click **Open**.
- Back on the **Add Content Element** page, click **Add Content**.
- Back on the **New Document** tab, click **Next** several times and then click **Finish**. Leave the default settings for all other fields.
- On the **Success** page, click **Open** to open the **Test Receipt** document properties page and then click **Refresh**.

- Open the **Security** tab and then verify that the only ACEs listed are **P8admins** and **P8admin** as you configured earlier for this document class.
- On the **Test Receipt** tab, open the **General** subtab, scroll down, and then select **Receipts** from the list for the **Inherit security from folder** field.



- Click **Save** and then open the **Security** subtab of the **Test Receipt** document.
- Click **Refresh** and then verify that **Finance admins** and **Finance managers** have inherited permissions and the **Source** column has **Inherited** as the value.

	<a href="#">Add Permissions...</a>	<a href="#">Edit...</a>	<a href="#">Remove</a>	
	Name	Source	Permission Type	Permission Group
<input type="checkbox"/>	Finance admins	Inherited	Allow	Custom
<input type="checkbox"/>	Finance managers	Inherited	Allow	Custom
<input type="checkbox"/>	p8admins	Default	Allow	Full Control
<input type="checkbox"/>	p8admin	Default	Allow	Full Control

- Log out of the administration console and close the browser.

## Test security inheritance.

In this task, you will check the security inheritance of the document in the IBM Content Navigator (ICN) desktop by logging in as Adam, who is a member of the Finance admins group.

- In the **Mozilla Firefox** browser, click the **Finance Desktop** bookmark or type the following URL: <http://vclassbase:9081/navigator/?desktop=FinanceDesktop>
- Type **Adam** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the **Browse** page, expand **Finance**, and then click the **Receipts** folder.
- Right-click the **Test Receipt** document and then select **Properties** from the list.

- Open the **Security** tab and then verify that **Finance managers**, **Finance admins**, **p8admin** and **p8admins** are all owners.

The screenshot shows the 'Security' tab selected in the top navigation bar. Under the 'Users and Groups' tab, the 'Owner:' field contains 'Finance admins' and 'Finance managers'. A tooltip box appears over the 'Finance admins' entry, stating 'These permissions are inherited from the parent.' Other users listed in the dropdown are 'p8admin' and 'p8admins'.

- Hover the mouse over **Finance admins** or **Finance Manager** (near the upward arrow) to verify that the permissions are inherited from the parent.  
The groups also have an inheritance indicator (Blue arrow).

The screenshot shows the 'Owner:' field containing 'Finance admins' and 'Finance managers'. A tooltip box appears over the 'Finance admins' entry, stating 'These permissions are inherited from the parent.'

- Click **Cancel**, log out of ICN **Finance Desktop**, and then close the browser.

# Configure designer group access

Your business scenario might require you to grant customized access to certain users who only need a subset of administration capabilities that is provided by Administration Console for Content Platform Engine (ACCE). You can create and control access to particular areas of the ACCE by implementing designer groups.

The following two types of designer groups are supported for custom access: Class Designer and Application Designer

The Class Designer group:

- limits administration console access to only the tools and settings that are used to create and modify classes
- is responsible for creating and updating the data models for an application or applications
- does not have more general capabilities, such as creating properties on the system, because changes at that level can impact other applications

The Application Designer group:

- is responsible for the various components related to creating a Content Platform Engine application
- can create properties that can affect a wider set of components (in addition to the data model capabilities of the Class Designer)
- can create and maintain workflow related configuration, including items like Rosters, Queues, Component Queues, and so on

Neither of these groups have permissions to perform Administrator functions such as managing domains and object stores. These capabilities are limited to established IBM FileNet P8 Platform administration users.

To grant custom access to designer groups, you must configure the groups in your directory server first, or designate existing groups to use. You then add the group names to a configuration file that you save to a directory that is accessible to your environment. The file and location are specified by a JVM argument. You can designate only one directory server group for each designer access group.

If you assign the same LDAP group for both designer groups, the LDAP group is given Application Designer access. If no designer group access is configured, the default administrative access persists.

To remove access restrictions from the groups, you can remove the group names from the file, or remove the file from the directory that is specified in the JVM argument.

# Activity: Implement designer group access

In this activity, you will configure access to specific areas in Administration Console for Content Platform Engine by designating Class Designer and Application Designer groups.

In your directory server, you designate or create the security groups to which you want to grant Class Designer or Application Designer access. You can use groups that are already configured. Two security groups, needed for this activity, are already created on your student system. Both groups are members of an IBM FileNet P8 Platform administration users group. To grant custom access to designer groups, you will add the group names to a configuration file in your environment, specify the file location in a JVM argument and then test the access for the two groups after applying access restrictions.

**Important:** This activity builds on the previous activities under the Security topics, and so ensure that the previous activities are completed.

In this activity, you will accomplish the following:

- Verify the directory server groups.
- Check the Class Design group access before the restriction is applied.
- Check the Application Design group access before the restriction is applied.
- Observe the configuration properties file.
- Set the JVM argument.
- Verify the group access after the restriction is applied.

## Verify the directory server groups.

Two groups, called ClassDesignGrp and AppDesignGrp, are configured in the directory server of your student system for this activity. Both groups are members of an IBM FileNet P8 Platform administration users group called p8admins which is also created on the student system and by default the two groups has complete access to ACCE.

- Click **Start > Administrative Tools > Active Directory Users and Computers**.

You can also use the Active Directory Users and Computers shortcut on the taskbar.

- From the **Active Directory Users and Computers** window, click the **Users** node on the left pane, and verify that the following groups are listed: **AppDesignGrp** and **ClassDesignGrp**.

 Agent	Security Group - Global
 AppDesignGrp	Security Group - Global
 Approver	Security Group - Global
 Case workers	Security Group - Global
 ClassDesignGrp	Security Group - Global
 Clerks	Security Group - Global

- Right-click **ClassDesignGrp** and select **Properties**.
- From the **Properties** Window, click the **Members** tab, verify that **Cathy** is listed.
- Select the **Member Of** tab, verify that **p8admins** is listed, and then click **Cancel**.
- Repeat the steps to examine the **AppDesignGrp** group and verify that **Arvin** is a member of the group.
- Repeat the steps to examine the **p8admins** group and verify that **ClassDesignGrp** and **AppDesignGrp** are members of the group.

p8admins Properties	
General	Members
<b>Members:</b>	
Name	Active Directory Domain Services Folder
 AppDesignGrp	edu.ibm.com/Users
 ClassDesignGrp	edu.ibm.com/Users
 p8admin	edu.ibm.com/Users

This membership provides Cathy and Arvin complete admin rights.

- Make a note of the two group names: **AppDesignGrp** and **ClassDesignGrp**

## Check the Class Design group access before the restriction is applied.

In this task, you will sign in as the member of ClassDesignGrp (Cathy) and check her access to the ACCE features and verify her admin rights before the restrictions are applied.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>

- Type **Cathy** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.

After the restriction is applied, Cathy will not be able to perform many of the administration actions, creating and configuring property templates, subscriptions, and sweep policies, and any workflow related configurations.

In the following steps, you will check that Cathy is able to perform the actions now before the restrictions are applied. Since the objective is to test the access to these actions, completing the configuration or creating an object is not required. But you can optionally complete the configuration using the tasks that you learned throughout this course.

- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder click the **Finance** object store.

As admin users, Cathy and Arvin have complete access to all the object stores and all the admin actions same as p8admin.

- From the **Finance** tab, expand the **Finance > Administrative** node on the left pane, and verify that this node and sub-nodes are accessible to **Cathy**.
- From the **Finance** tab, collapse the **Administrative** node, expand the **Finance > Data Design** node on the left pane, right-click **Property Templates** and select **New Property Template** from the list.

This step verifies that Cathy has access to create a property template.

- Click **Cancel** to close **New Property Template** tab.
- On the left pane, collapse the **Data Design** node, expand the **Finance > Events, Actions, Processes** node, right-click **Subscriptions** and select **New Subscription** from the list.

This step verifies that Cathy has access to create a Subscription.

- Click **Cancel** to close the **New Subscription** tab.
- On the left pane, collapse the **Data Design**, and verify that Cathy has access to **Sweep Management** configuration.

You will learn more about Sweep Management in a later activity.

- Log out of Administration Console for Content Platform Engine and close the browser.

## Check the Application Design group access before the restriction is applied.

In this task, you will sign in as the member of AppDesignGrp (Arvin) and check his access to the ACCE features and verify his admin rights before the restrictions are applied.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **Arvin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder click the **Finance** object store.
- From the **Finance** tab, expand many nodes on the left pane and observe that Arvin has access to all the nodes and actions.
- Expand the **Finance > Administrative** node on the left pane, right-click **Workflow System** and select **New** from the list.

Since only one Workflow system can be created per object store, do not complete the wizard now, so that you can test it later.

After the restriction is applied, Arvin will not be able to perform some of the admin actions such as configuring a Workflow System.

- Click **Cancel** to close the **New Workflow System** tab.
- Log out of Administration Console for Content Platform Engine and close the browser.

## Observe the configuration properties file.

In this task, you observe the configuration properties file that contains the LDAP directory security groups that you want to use for designer groups. This file is already created for your student system.

- In **Windows Explorer**, navigate to the **C:\Training\F2810G** folder, right-click the **restrictedGroups.properties** file and select **Edit with Notepad++** from the list.
- Observe the following text in the file:

```
#Specify LDAP group names for ClassDesigner and
ApplicationDesigner
```

```
ClassDesigner=ClassDesignGrp
```

```
ApplicationDesigner=AppDesignGrp
```

Recall the Active Directory group names that you checked:

- AppDesignGrp is your designated LDAP Group for Application Designers
- ClassDesignGrp is your designated LDAP Group for Class Designers

You can designate only one directory server group for each designer group.

If Content Platform Engine is in a cluster environment, the file must be available to every node. In this scenario, a location on a shared network drive is recommended to keep access groups in synch.

- Close the file.

## **Set the JVM argument.**

In this task, you will set generic Java Virtual Machine (JVM) arguments in the administration console for WebSphere Application Server. The generic JVM arguments are used to configure and adjust how the JVM executes. Once changes are made and saved to the master configuration, the JVM requires a restart for the arguments to take effect.

- In the **Mozilla Firefox** browser, click the **WAS** bookmark or enter the following URL: <https://vclassbase:9043/ibm/console/logon.jsp>
- Type the following values for user ID and password and then click **Log In**.
  - User name: **wasadmin**
  - Password: **FileNet1**
- Click **Log In**.
- In **WebSphere Integrated Solutions Console**, on the left pane, expand **Servers > Server Types** and then select **WebSphere application servers**.
- On the right pane, click the **server1** link.  
This is the server for Content Platform Engine.
- On the **server1** page > **Configuration** tab, scroll down, under the **Server Infrastructure** section on the right pane, expand **Java and Process Management** and then select **Process definition**.
- Under the **Additional Properties** section on the right, click **Java Virtual Machine**.
- Scroll down to the textbox for **Generic JVM arguments** and notice that the following entries are already listed.  
-Duser.language=en -Duser.gregion=US -Duser.country=US  
Each JVM argument is separated by a space (delimiter).

- Enter a space and then type the following text in the textbox.

-DrestrictedGroups=C:/Training/F2810G/restrictedGroups.properties

**Generic JVM arguments**

```
-Duser.language=en -Duser.gregion=US -Duser.country=US
-DrestrictedGroups=C:/Training/F2810G/restrictedGroups.properties
```

- Scroll down and click **OK**.
- When the **Save** link becomes available at the top of the page, click **Save** to save it to master configuration.

You will restart the server in the following steps.

- On the left pane, expand **Servers > Server Types** and then select **WebSphere application servers**.
- From the **Application servers** page on the right pane, select **server1** row by selecting the checkbox on the **Select** column and then click **Stop**.
- When you are prompted to stop the server, click **OK**, wait for the server to stop, and then click **OK** again to close the page.

On the Application servers page, the stop status for server1 is shown with a red X icon on the Status column.

- Select **server1** row again by clicking the checkbox on the **Select** column and then click **Start**.

Wait for the server to start. On the Application servers page, the start status for server1 is shown with a green forward arrow icon.

Occasionally, after a JVM configuration change, you might find that there is a long delay to start the server. If this happens, refresh the page and start the server again.

- Log out of the administration console and close the browser.

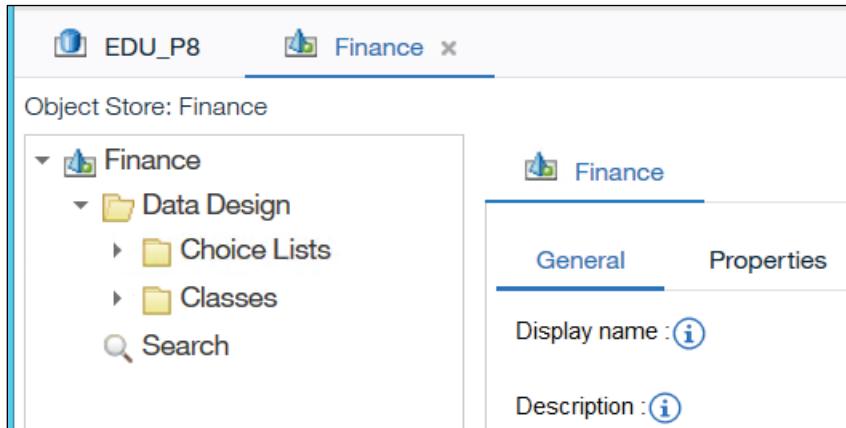
## **Verify the group access after the restriction is applied.**

In this task, you will sign in as members of the ClassDesignGrp (Cathy) and AppDesignGrp (Arvin) groups and check their group access to the design capabilities of ACCE.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **Cathy** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **Finance** object store.
- On the **Finance** tab, verify that you only view the **Finance > Data Design** node and **Search** on the left pane.

Recall that the same user was able to view all other features before applying the restrictions, including the actions under the Administrative, Events, Actions, Processes, and Sweep Management nodes.

- In the **Finance** tab, expand the **Finance > Data Design** node and verify that only **Classes** and **Choice Lists** node are shown.



Recall that the same user was able to create property templates under the Data Design node.

Observe that on the right pane, only two subtabs are accessible: General and Properties. Most other subtabs that help in administration of this object store is not available to this group.

Class Designers group (ClassDesignGrp) are allowed to perform only the data design tasks and will not be able to perform the administration tasks.

- Log out of the administration console, log back in as **Arvin** (Password: **FileNet1**).
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **Finance** object store.

- On the **Finance** tab, verify that many nodes are accessible on the left pane, under the **Finance** node.

Application Designers group (AppDesignGrp) are allowed to perform many administration tasks, in addition to data design, as compared to the Class Designers group (ClassDesignGrp).

Observe that on the right pane, many subtabs are accessible to Arvin as compare to the Cathy.

- From the **Finance** tab, expand the **Finance > Administrative** node on the left pane, right-click **Workflow System** and select **New** from the list.  
The Workflow topic is discussed in a separate course. For this activity, the objective is to test the access to this feature for an Application Designer.
- On the **New Workflow System** tab, under the **Table Spaces** section, type **OS\_DB\_TS** for the **Data** field.
- Under the **Workflow System Security Groups** section, click **Browse** next to the **Administration group**.
- On the **Add Users and Groups** page, search for **P8admins**, move it to the **Selected Users and Groups** pane, and then click **OK**.
- Back on the **New Workflow System** tab, click **Next**.
- For the **Connection point name** field, type **FinanceCP3** and then click **Next**.
- For the **Isolated region name** field, type **FinanceRegion**, scroll down to the **Isolated region number** field, and then type **3**.
- Click **Next** and then on the **Specify Isolated Region Table Space (Optional)** page, click **Next** again.

- On the **Summary** page, click **Finish**.

Observe that you get an error with the message: the requester has insufficient access rights to perform the requested operation.

**Error**

**FNRAC1001E**  
An unexpected error occurred.

**User response:** Check the error details for more information and contact IBM Software Support if necessary.

**Exception details:**

The requester has insufficient access rights to perform the requested operation.

Because of the restrictions applied, Arvin cannot configure a Workflow system.

- Click **OK** to close the Error page and then click **Cancel** to close **New Workflow System** tab.
- Log out of the administration console and then close the browser.

Optionally, you can further the testing by removing the restriction and verifying if Arvin is able to create a Workflow system.

To remove access restrictions from the groups, remove the group names from the file, or remove the file from the directory that is specified in the JVM argument.

# Secure content with role-based access

A role can define different types of access for different objects. When you create roles, you configure role permissions by specifying classes of objects and the types of access permissions to those objects. For example, an administrator role might grant modify properties and create children (folders and documents) access for folder objects. Security for an object includes any associated roles plus normal access permissions.

## Benefits of role-based access

Role-based access provides the following benefits:

- Multiple role permissions for a single object

Many roles can be associated with an object. Each role encapsulates a set of access rights. For example, a Content Developer role might have Write access while a Reviewer role might have only Read access. If user is a member of many roles, the rights granted by each role are combined.

Role permissions can be applied directly, introduced by a security template, inherited, or created as the default access scheme.

- A single role with multiple access definitions

A single role can define different access to different types of objects. For example, a role can define one set of permissions for Documents and another set of permissions for Folders.

You can change role-based access without sweeping through all applicable objects. You can easily determine which roles are associated with an object. Role associations are displayed on the Security tab along with other ACL entries.

- The Content Platform Engine (CPE) administrator manages access changes

Changing LDAP group membership requires LDAP administration permission and tools. With role-based access, a CPE administrator can use the Administration Console for Content Platform Engine to change the membership of a static role. These access updates can also occur more quickly than LDAP updates.

- Introduce Custom logic

A Dynamic Role offers the opportunity to incorporate custom logic into access control decisions. Dynamic roles enable you to specify the users or groups in the role within a code extension, rather than statically storing them in Content Platform Engine.

- Use in an IBM Content Navigator (ICN) Entry template

Using role-based access can simplify entry template usage. You can designate a role for the entry template, and the role can be updated with user and group changes without having to update each entry template or existing document added by a template.

Note: This role capability is exposed only in entry templates in ICN.

## Role classes

Roles are created as classes that exist in and apply to a specific object store.

A default class called Roles provides two subclasses. To create a new role, you must create a new subclass first from either the Static Role subclass or the Dynamic Role subclass.

- Static role

A static role contains users and groups that are assigned directly to the role. The behavior of a static role is similar to the way ACLs are assigned to an object.

- Dynamic Role

A dynamic role uses external code to determine whether a user is a member of the role. This approach enables more dynamic role assignments that are based on application use cases. In a dynamic role, the role membership handler, the `isUserInRole` method, returns a Yes or No response to the question of whether the specified user is a member of the role.

## Considerations when implementing roles

Role-based access control works best in an environment where there is a high ratio of controlled objects to role instances. A model in which there are only a few objects controlled by each role will generally perform less well and is not recommended.

For more information on the process of evaluating access with roles, refer to the IBM FileNet P8 Platform V5.5.x Knowledge Center:

[https://www.ibm.com/support/knowledgecenter/SSNW2F\\_5.5.0/com.ibm.p8.security.doc/p8psa081.htm](https://www.ibm.com/support/knowledgecenter/SSNW2F_5.5.0/com.ibm.p8.security.doc/p8psa081.htm)

# Activity: Configure role-based access

You can create roles that determine what access the users in that role have to objects in your object store. Roles are created as classes and they exist in and apply to a specific object store.

Important: This activity builds on the previous activities under the Security topics, and so ensure that the previous activities are completed.

In this activity, you will accomplish the following:

- Preparation: Create a Document class.
- Preparation: Add a folder and a document.
- Test the security of a document before a role is applied.
- Create a role subclass.
- Create a static role.
- Associate the role instance with a document object.
- Test the security of the document after a role is applied.

## Preparation: Create a Document class.

In this task, you will create a property template and a Document class and set the default instance security to use it for the following tasks.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder click the **Finance** object store.
- From the **Finance** tab, expand the **Data Design** node on the left pane, right-click **Property Templates**, and then click **New Property Template**.
- From the **New Property Template** tab on the right pane, type **DocCategory** for the **Display name** field.  
The Symbolic Name and Description fields are automatically populated.
- Click **Next** and then, for the **Data type** field, select **String** from the list.
- Click **Next** two more times and then for the **Single or multi-value** field, select **Single**, and click **Next**.

- On the **Summary** page, click **Finish** and then click **Close** on the **Success** page.
- On the **Finance** tab, click **Refresh**.
- Expand the **Data Design > Classes** node on the left pane, right-click **Document** and then click **New Class**.
- On the **New Document Class** tab, type **Finance Docs** for the **Display name** field. The Symbolic Name and Description fields are automatically populated.
- Complete the wizard by clicking **Next**, **Finish**, and then **Close**.
- In the **Finance** tab, click **Refresh**.
- On the left pane, expand the **Data Design > Classes > Document** node, and then click **Finance Docs**.
- From the **Finance Docs** tab on the right pane, click the **Property Definitions** subtab and then click **Add**.
- On the **Add Properties** page, type **DocCategory** in the filter field to select the property template that you added.
- Select **DocCategory**, scroll down, and then click **OK** to close the **Add Properties** page.
- On the **Finance Docs** tab, verify that **DocCategory** is listed and then click **Save**.
- Click **Refresh**, open the **Default Instance Security** subtab, remove all the users and groups except **p8admins** and **p8admin**.
- Click **Add Permissions** and then select **Add User/Group Permission**.
- On the **Add Users and Groups** page, search for **Finance managers**, select it from the **Available Users and Groups** pane, and move the group to the **Selected Users and Groups** pane by clicking the forward arrow.
- Select **Finance managers** the **Selected Users and Groups** pane, scroll down to the **Permissions** section, select **Full Control** for the **Permission group** field, and then click **OK**.
- On the **Finance Docs** tab, click **Save**.
- Repeat the steps to add **Finance clerks** and **Finance reviewers** with **View content <Default>** for the **Permission group**.
- On the **Finance Docs** tab, click **Save**.

- Under the **Access Permissions** section, verify that the security groups are listed with the Permission Group you configured.

	Name	Source	Permission Type	Permission Group
	Finance clerks	Direct	Allow	View content <Default>
	Finance managers	Direct	Allow	Full Control
	Finance reviewers	Direct	Allow	View content <Default>
	p8admins	Direct	Allow	Full Control
	p8admin	Direct	Allow	Full Control

- Log out of the Administration console and close the browser.

## Preparation: Add a folder and a document.

In this task, you will log in to the IBM Content Navigator (ICN) desktop as P8admin, add a folder and a document to test the access in the following tasks.

- In the **Mozilla Firefox** browser, click the **Finance Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator/?desktop=FinanceDesktop>
- Type **P8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the **Browse** page, click **New Folder** from the toolbar.
- On the **New Folder** page, type **Finance Docs** for the **Folder Name** field.
- Under the **Security** section, for the **Reader** field, leave **p8users** and remove the other groups.
- Click **Select** next to **Specific users and groups**.
- On the **Add permissions** page, select **Groups** for the search for field, and then search for the **Finance admins** group.
- Select **Finance admins** from the **Available** pane and then move the group to the **Selected** pane by clicking the forward arrow.
- Scroll down, select **Owner** for the **Permissions** field, and then click **Add**.
- Repeat the steps to add **Finance reviewers** and **Finance clerks** with **Reader** level permissions.
- On the **New Folder** page, click **Add** in the lower right to create the folder.

- Back on the **Browse** page, double-click **Finance Docs** to open the folder and then click **Add Document** from the toolbar.
- On the **Add Document** page, for the **What do you want to save?** field, select **Local Document** from the list and then click **Browse**.
- On the **File Upload** page, select any file (Example: **MarketingPlan5.pdf**) from the **C:\Training\F2810G\SampleDocs** folder and then click **Open**.
- Back on the **Add Document** page, Select **Finance Docs** for the **Class** field.
- For the **Document Title** field, change the text to **Finance Doc1** and then type **Support** for the **DocCategory** field.

**Properties**

* Class:	Finance Docs
Document Title:	Finance Doc1
DocCategory:	Support

- Under the **Security** section, verify that this document has the default instant security from the Document class that you created earlier.

**Security**

Users and Groups	Roles
Share with:	Specific users and groups <input type="button" value="Select..."/>
Owner:	Finance managers <input type="button" value="x"/> p8admin <input type="button" value="x"/> p8admins <input type="button" value="x"/>
Author:	
Reader:	Finance clerks <input type="button" value="x"/> Finance reviewers <input type="button" value="x"/>

- Verify that the **Finance clerks** and **Finance reviewers** have **Reader** access. You will be changing this security through role-based access.

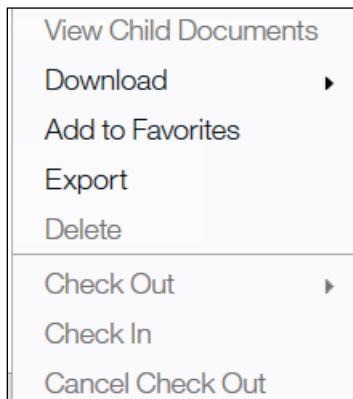
- Click **Add** in the lower right corner and then back on the **Browse** page, verify that the new document is listed.
- Log out of ICN **Finance Desktop** and then close the browser.

## **Test the security of a document before a role is applied.**

In this task, you will log in as a member of the Finance clerks group (Carol) to test the access to a document in the ICN desktop before applying role permissions to the document.

- In the **Mozilla Firefox** browser, click the **Finance Desktop** bookmark or type the following URL: <http://vclassbase:9081/navigator/?desktop=FinanceDesktop>
- Type **Carol** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the **Browse** page, double-click **Finance Docs** to open the folder.
- Right-click the **Finance Doc1** document that you added and then verify that Carol does not have permissions to check out the documents.

The actions are grayed out (not enabled) in the list in contrast to Download, Add to Favorites, or Export for which Carol has permissions.



Finance clerks group (Carol) has **Reader** access and so they cannot check out a document.

- Log out of ICN **Finance Desktop** and then close the browser.

## Create a role subclass.

To create an instance of a role, you must first create a subclass of the Role class. In this task, you will create a subclass for the role. You will specify the document class on which this role is applied, and the access rights.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder click the **Finance** object store.
- From the **Finance** tab, expand the **Finance > Data Design > Classes > Other Classes > Role** node on the left pane.
- Right-click **Static Role** and select **New Class** from the list.
- On the **New Static Role Class** tab, type **EduRole** for the **Display name** field and press enter.

Verify that the Symbolic name and the Description fields are automatically populated.

- Click **Next** and then click **Finish** in the **Summary** page.
- On the **Success** page, click **Open** to open the new Role class that you created. You will edit this class to add access definitions in the next step.
- In the **EduRole** tab, click **Refresh**, select the **Role Access Definitions** subtab, and then click **Add**.
- In the **Controlled Class and Access Mask** page, select **Finance Docs** for the **Controlled class** field and then select the following access rights for the **Access permissions** field:
  - **View all properties**
  - **Modify all properties**
  - **View content**
  - **Create instance**
  - **Minor versioning**
  - **Major versioning**
  - **Read Permissions**

**Controlled Class and Access Mask**

Controlled class : <a href="#">(i)</a>	Finance Docs <a href="#">▼</a>														
Access permissions : <a href="#">(i)</a>	<table border="1"> <thead> <tr> <th><input type="checkbox"/> Access Right</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/> View all properties</td> </tr> <tr> <td><input checked="" type="checkbox"/> Modify all properties</td> </tr> <tr> <td><input type="checkbox"/> Reserved12 (Deploy is deprecated)</td> </tr> <tr> <td><input type="checkbox"/> Reserved13 (Archive is deprecated)</td> </tr> <tr> <td><input checked="" type="checkbox"/> View content</td> </tr> <tr> <td><input type="checkbox"/> Link a document / Annotate</td> </tr> <tr> <td><input type="checkbox"/> Publish</td> </tr> <tr> <td><input checked="" type="checkbox"/> Create instance</td> </tr> <tr> <td><input type="checkbox"/> Change state</td> </tr> <tr> <td><input checked="" type="checkbox"/> Minor versioning</td> </tr> <tr> <td><input checked="" type="checkbox"/> Major versioning</td> </tr> <tr> <td><input type="checkbox"/> Delete</td> </tr> <tr> <td><input checked="" type="checkbox"/> Read permissions</td> </tr> </tbody> </table>	<input type="checkbox"/> Access Right	<input checked="" type="checkbox"/> View all properties	<input checked="" type="checkbox"/> Modify all properties	<input type="checkbox"/> Reserved12 (Deploy is deprecated)	<input type="checkbox"/> Reserved13 (Archive is deprecated)	<input checked="" type="checkbox"/> View content	<input type="checkbox"/> Link a document / Annotate	<input type="checkbox"/> Publish	<input checked="" type="checkbox"/> Create instance	<input type="checkbox"/> Change state	<input checked="" type="checkbox"/> Minor versioning	<input checked="" type="checkbox"/> Major versioning	<input type="checkbox"/> Delete	<input checked="" type="checkbox"/> Read permissions
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<input checked="" type="checkbox"/> Major versioning															
<input type="checkbox"/> Delete															
<input checked="" type="checkbox"/> Read permissions															

- Scroll down and then click **OK**.  
You can add more access definitions or remove any of the existing ones.
- On the **EduRole** tab, click **Save** and then click **Close**.
- From the **Finance** tab, click **Refresh** and then verify that the new class (**EduRole**) is added under **Data Design > Classes > Other Classes > Role > Static Role** node.

This class is now available to create instances of roles.

## Create a static role.

In this task, you will create a role instance from the Static Role subclass (that you created in the previous task) and add role members.

- On the left pane, collapse the **Data Design** node, and then expand the **Roles** node.
- Right-click the **Static Roles** node and then select **New Static Role** from the list.
- From the **New Static Role** tab on the right pane, type **Content Dev Role** for the **Display name** field and then scroll down.
- Scroll down, for the **Static role class** field, if it is already not selected, select **EduRole** from the list, and then click **Next**.

On the Setup Role Members page, you can add users and groups (principal), add a realm, or add a nested role. For a nested role, you can add an existing role to this one.

- On the **Setup Role Members** page, click **Add Principal**.
- In the **Add Users and Groups** page, type **Carol** in the **Search by** field and then click **Search**.
- Select **Carol** from the **Available Users and Groups** pane, click the forward arrow to move to **Selected Users and Groups**, and then click **OK**.
- On the **Setup Role Members** page, verify that **carol@edu.ibm.com** is added under the **Role Member** section.

You can add many members to this role. You can also add groups. For this activity, you are adding one of members of the Finance clerks group.

- Click **Next**, click **Finish** on the **Summary** page, and then click **Close** on the **Success** page.

The role instance that you created in this task grants the permissions to the specified classes that you configured on the role class.

- On the **Finance** tab, click **Refresh**.

## Associate the role instance with a document object.

You created a role instance in the previous task. In this task, you will assign this role instance to a document object to secure it with role-based access control.

- On the left pane, expand the **Finance > Browse > Root Folder** node and click the **Finance Docs** folder.
- From the **Finance Docs > Contents** subtab on right pane, click the **Finance Doc1** document link.
- On the **Finance Doc1** tab, click **Refresh** and then select the **Security** subtab.

Notice that the Finance clerks group (with View content permissions) is already listed for this document. Carol is a member of Finance clerks. Finance clerks do not have permission to check out the documents as you verified for Carol before. Carol will be able to do these tasks after the role access is added.

- From the **Security** subtab, click **Add Permissions** and then select **Add Role Permission** from the list.
- In the **Add Role Permission** page, type **Content Dev Role** in the **Display name** field, click **Search** and then select **Content Dev Role** (by selecting the checkbox next to it).
- Scroll down, select **This Object only** for the **Apply to** field, and then click **OK**.
- On the **Finance Doc1** tab, verify that the **Content Dev Role** is added to the **Access Permissions** list and the **Permission Type** column shows **EduRole**.

	Name	Source	Permission Type	Permission Group
<input type="checkbox"/>	Finance clerks	Direct	Allow	View content <Default>
<input type="checkbox"/>	Finance managers	Direct	Allow	Full Control
<input type="checkbox"/>	Finance reviewers	Direct	Allow	View content <Default>
<input type="checkbox"/>	p8admins	Direct	Allow	Full Control
<input type="checkbox"/>	Content Dev Role	Direct	EduRole	

- Click **Save** and then click **Close**.
- Log out of the administration console and close the browser.

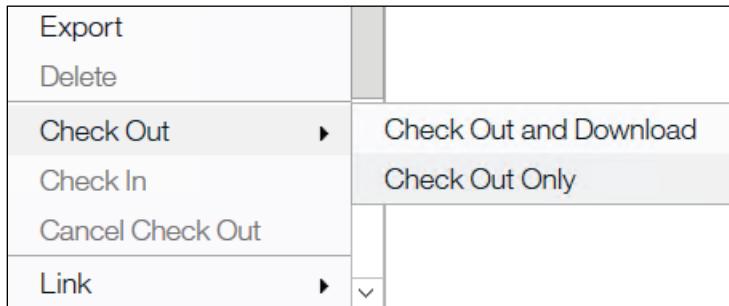
## Test the security of the document after a role is applied.

In this task, you will log in as Carol to test the access to a document in the ICN desktop after applying role permissions to the document.

- In the **Mozilla Firefox** browser, click the **Finance Desktop** bookmark or type the following URL: <http://vclassbase:9081/navigator/?desktop=FinanceDesktop>
- Type **Carol** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the **Browse** page, double-click **Finance Docs** to open the folder.
- Right-click the **Finance Doc1** document and then verify that Carol now has permissions to check out the documents.

The checkout action is not grayed out and it is enabled now.

This is the same document you used to test the security before applying the role permission.



- Log out of ICN **Finance Desktop** and then close the browser.

# Use bulk operations

Administrators sometimes must change multiple objects (hundreds or even thousands of documents). It is inefficient to change objects individually. But you can change multiple objects by using bulk actions and batch operations.

You can perform bulk actions on search and sweep results. In this unit, you will learn about bulk operations on searches.

You can find the documents by using a search, and then update them by using a bulk action. The application of these actions occurs either while the query runs or after the query runs. For actions that are applied after a query runs, you select the search results to which the actions apply.

## Bulk actions and bulk operations

Bulk actions:

- are performed on objects during a search
- affect all objects that the search returns
- can be combined to perform several actions at the same time
- must be enabled before initiating the search

Batch operations:

- can be accessed from searches and other containers
- affect only selected objects
- can perform only one action at a time

## Types of Bulk actions

The following are the two main types of bulk actions:

- Predefined - The actions are predefined and you specify them by selecting checkboxes, such as deletion or canceling check-out of documents.  
You can select actions that might not be relevant for all search results. If an action is not relevant to a particular search result, it is not executed for that result.
- Script - You can define more bulk actions with a JavaScript script. To allow future reuse, save your scripts with a .js extension.

For more information, refer to the IBM FileNet P8 Platform V5.5.x Knowledge Center:

[https://www.ibm.com/support/knowledgecenter/SSNW2F\\_5.5.0/com.ibm.p8.ce.admin.tasks.doc/p8pcc438.htm](https://www.ibm.com/support/knowledgecenter/SSNW2F_5.5.0/com.ibm.p8.ce.admin.tasks.doc/p8pcc438.htm)

# Activity: Use bulk actions to modify security for multiple documents

Bulk actions are a powerful way to update multiple documents and should be used with caution. In this activity, you will create a search with a bulk action to update multiple documents simultaneously.

In this activity, you will accomplish the following:

- Check the security before running the bulk actions.
- Create a search for marketing materials.
- Create and run bulk actions that update security on the search results.
- Verify the security change on the marketing materials.

## Check the security before running the bulk actions.

In this task, you will check the security of the documents before you run the bulk actions that adds the Marketing security group.

- Ensure that the IBM FileNet P8 Platform components are started.  
If you have not started them earlier, start the components by using the earlier activity: *Prepare your system - Start IBM FileNet P8 Platform*.
- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and then click the **Sales** object store.
- From the **Sales** tab, expand the **Sales > Browse > Root Folder** node on the left pane and then click **Marketing**.
- From the **Marketing** tab on the right pane, click the link of a document (Example: **MarketingPlan1.docx**).
- On the **MarketingPlan1.docx** tab, select the **Security** subtab and verify that the **Marketing** security group is not listed under the **Access Permissions** section.

The Marketing group is already configured in the Active Directory on your student system. You will run a bulk action to add the Marketing group to the documents in the next task.

- Close the **Marketing** and **MarketingPlan1.docx** tabs.
- Leave the administration console open for the next task.

## Create a search for marketing materials.

In this task, you will create a search for use in bulk actions. You have already logged in to the administration console as p8admin and the Sales object store tab is opened.

- From the **Sales** tab, click **Search** on the left pane.
- From the **Saved Searches** tab on the right pane, click **New Object Store Search**.
- On the **New Object Store Search** tab > **Simple View** subtab, select **Document** for the **Class** field and then click **Yes** when you are prompted to fetch properties for the Document of Subclasses.
- Enter the following values under the **Criteria** section:
  - Property: **Document Title**
  - Condition: **Starts With**
  - Value: **Marketing**

Search: New Object Store Search		
Simple View	SQL View	Bulk Actions (Disabled)
Class : <a href="#">(i)</a>	Document	<a href="#">▼</a>
<b>Criteria</b> <a href="#">(i)</a>		
Property	Condition	Value
A <a href="#">Document Title</a>	<a href="#">▼ Starts With</a>	<a href="#">▼ Marketing</a>

The values you entered are used to construct a query for the objects of Document class. For an SQL statement, class (Document) is the table, each object is a row, and object properties (Document Title) are the selected columns.

You will enable the bulk actions in the next task and then run the search.

## Create and run bulk actions that update security on the search results.

The search is open and the bulk actions are currently disabled. In this task, you will enable them, configure the update security bulk action, and then run the search.

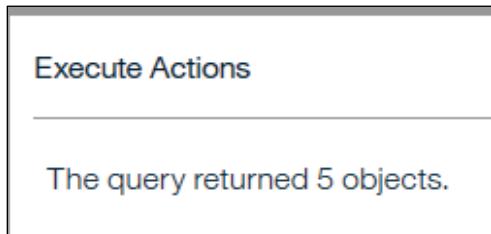
- On the **New Object Store Search** tab, click the **Bulk Actions (Disabled)** subtab and then select **Enable**.



- Scroll down to the **Security** area and then select the **Update security** option.
- Click **Add** and then select **Add User/Group Permission**.  
You can also specify a role for role-based access.
- On the **Add Users and Groups** page, type **Marketing** in the **Search** field and then click **Search**.
- Select the **Marketing** group, move it to **Selected Users and Groups** by using the right arrow, and then click **OK**.
- Back the **New Object Store Search** tab, verify that the **Marketing** group is listed under the **Security** section.
- Scroll down to the **Permissions** area and then select the checkboxes under the **Add Allow** column for the following permissions.
  - View all properties
  - Modify all properties
  - View content
  - Create an instance
  - Change state
  - Minor versioning
  - Major versioning
  - Read permissions

- Click **Run**.

The **Execute Actions** page with a message about the query results is displayed.



- Click **Close** on the **Execute Actions** page and leave the **New Object Store Search** tab opened for the next activity.

## Verify the security change on the marketing materials.

In the previous task, you ran a search that included a bulk action to update security. The action occurred as the search ran. Inspect one of the documents to ensure that the Marketing group was added to the document. The search tab is open, displaying the search that you recently ran.

- On the **Bulk Actions (Enabled)** tab, clear the **Enable** checkbox to disable bulk actions, click **Run** to run the search again, and then view the search results.
- Click the title of one of the documents in the **Search Results** table.  
The document properties page opens in a tab.
- On the document properties page, open the **Security** tab and then verify that **Marketing** is now displayed in the **Access Control List**.

	Name	Source	Permission Type	Permission Group
<input type="checkbox"/>	Marketing	Direct	Allow	Custom

If Marketing is not displayed, click Refresh.

- Select the checkbox for the **Marketing** row and then click **Edit**. Verify that the permissions match the permissions that you specified for this group in the bulk action.
- Click **Cancel** and then click **Close** to close the document properties page.
- Click **Close** on the **New Object Store Search** tab, click **OK** to close when you are prompted, and then close the **Saved Searches** tab.
- Log out of the administration console and then close the browser.

# Activity: Use bulk operations to cancel checkout of documents

Assume an example scenario where Misty, a member of the Marketing group, has left the company. Some of the documents were still checked out by this user. As an administrator, you must cancel the checkout so that other users can edit these documents. In this activity, you will use bulk operations that cancels checkout on all of the documents that Misty has checked out.

Important note: This activity builds on the previous activity and so ensure that the *Use bulk actions to modify security for multiple documents* activity is completed.

In this activity, you will accomplish the following:

- Preparation: Check out documents.
- Use batch operations to cancel the check out.

## Preparation: Check out documents.

In this task, you will log on as Misty and check out some documents in the IBM Content Navigator (ICN) client to use later with the bulk action.

- In the **Mozilla Firefox** browser, click the **Finance Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator/?desktop=FinanceDesktop>
- Type **Misty** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- Click the down arrow next to **Finance** on the upper right and select the **Sale** repository from the list.
- On the left pane, click the **Marketing** folder.
- Right a click a document that begin with **MarketingPlan** in the title and then select **Properties**.
- On the **Properties** page, select the **Security** tab, and verify that the **Marketing** group is listed for the **Author** field.



- Select all the documents that begin with **MarketingPlan** in the title (5 documents) and then click **Actions > Check Out > Check Out Only** to check out the documents.

			Delete		
Testfile4.docx	200 KB	p8adm	Check Out	▶	Check Out and Do
MarketingPlan5.docx	43 KB	p8adm	Check In		Check Out Only
MarketingPlan4.docx	43 KB	p8adm	Cancel Check Out		50 AM 1
MarketingPlan3.docx	43 KB	p8adm	Link	▶	50 AM 1
MarketingPlan2.docx	43 KB	p8adm	Send Email	▶	50 AM 1
MarketingPlan1.docx	42 KB	p8adm	Version	▶	50 AM 1

Misty is a member of the Marketing group and she can check out only documents to which the Marketing group has major and minor versioning permissions. You set these permissions in the previous task through a bulk action.

- Verify the checked out documents have a lock icon and then log out of the ICN desktop and close the Browser.

## Use batch operations to cancel the check out.

In this task, you will log in as an administrator (p8admin) and use batch operations to cancel the checkout of the Marketing documents that Misty has checked out.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and then click the **Sales** object store.
- In the **Sales** tab, expand the **Sales > Browse > Root Folder** node on the left pane and then click **Marketing**.
- From the **Marketing** tab on the right pane, select the documents that begin with **MarketingPlan** in the title (5 documents that have lock icon) and then click **Actions > Batch Operations**.

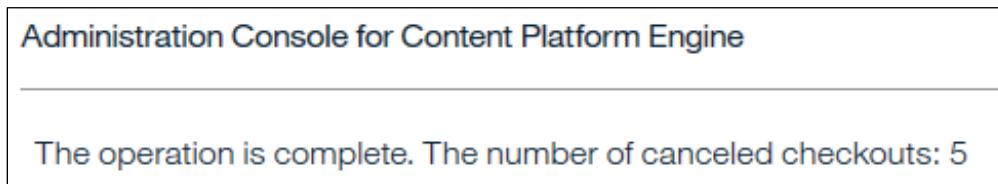
Use the Actions menu from the Contents subtab.

- On the **Batch Operations** page, open the **Actions** tab, select the **Cancel checkout** option under **Versioning**, and then click **OK**.

- Click **OK** when you are prompted with the message for the Cancel checkout.



- Click **OK** again when you get a message that the operation is complete.



- Back on the **Marketing** tab, verify that the checkout is cancelled for the documents that you selected (The lock icon is not shown now).
- Log out of the administration console and then close the browser.

# Configure content-based retrieval searches

In this section, you will learn about configuring content-based retrieval searches for FileNet P8 Platform. The system uses IBM Content Search Services to permit full-text searches for objects.

## What is content-based retrieval (CBR)?

CBR is also known as full-text searching. Full-text indexing is not related to creating index properties (known as single indexing or database indexing). CBR finds words or phrases within the text of a document. In addition, CBR searches can find words that are similar to one another.

CBR supports most document types such as Microsoft Office documents, PDF, HTML, ASCII, and other formats. It can also search in XML tags.

## Configure IBM Content Search Services (CSS)

CSS manages content-based indexing and searching tasks. After CSS is installed, you must first configure a text search server to work with the Content Platform Engine (CPE) to be able to use content-based retrieval (CBR) type searches. You must also enable CBR searches on the object store and the document classes that you want to make searchable.

A single instance of the IBM CSS server can perform both the indexing and searching tasks for the CPE. The CSS server performance degrades when indexing and searching run in parallel (dual mode) under moderate to high content-based retrieval (CBR) workloads. You can achieve optimal performance under moderate to high CBR workloads if you dedicate each CSS server to either one or the other operation (searching or indexing).

## Start and stop IBM Content Search Services server

You can start and stop the CSS server by using graphical user interface (GUI) or command line instructions.

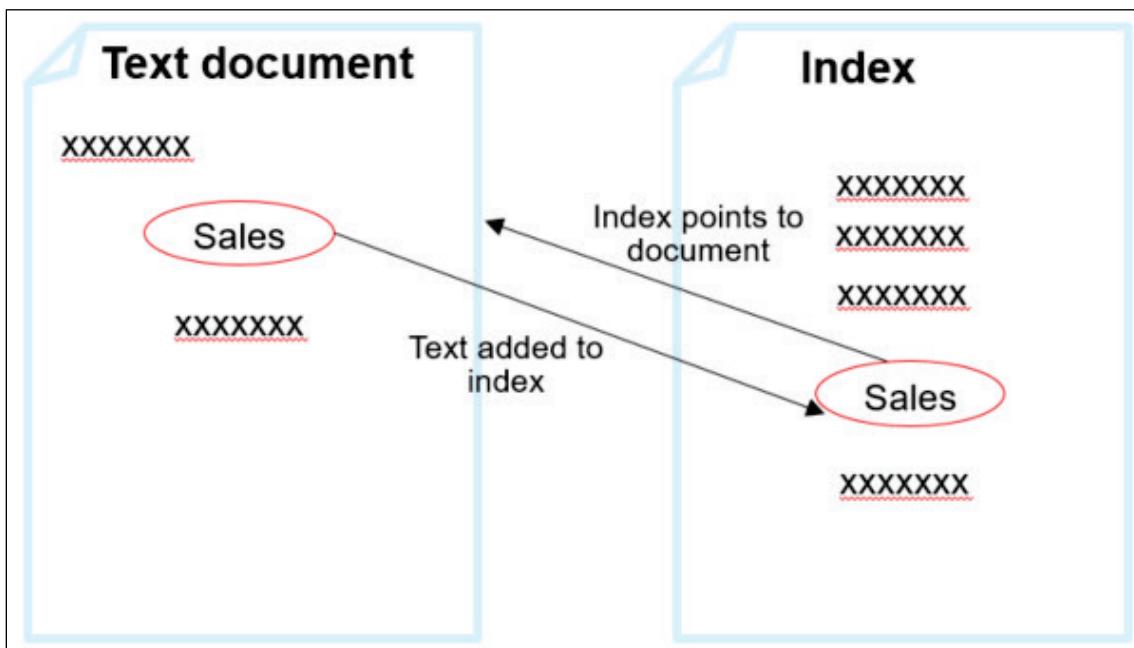
- GUI (Windows only)

If CSS is installed on Windows as a service, use the Windows Services console to start CSS server. You can configure it to start automatically.

- Command line
  - Windows startup and shutdown  
`[css_install_location]\[Server_name]\bin\startup.bat`  
`[css_install_location]\[Server_name]\bin\shutdown.bat`  
`[Server_name]` specifies the name for the CSS Server.
  - Unix startup and shutdown  
`CSS_installation_directory/[Server_name]/bin/startup.sh`  
`CSS_installation_directory/[Server_name]/bin/shutdown.sh`

## The relationship between an index entry and a document

Content index is a file that contains pointers to the character-based content in an object store. Like an index in the back of a book, instead of page numbers, index stores references to documents.

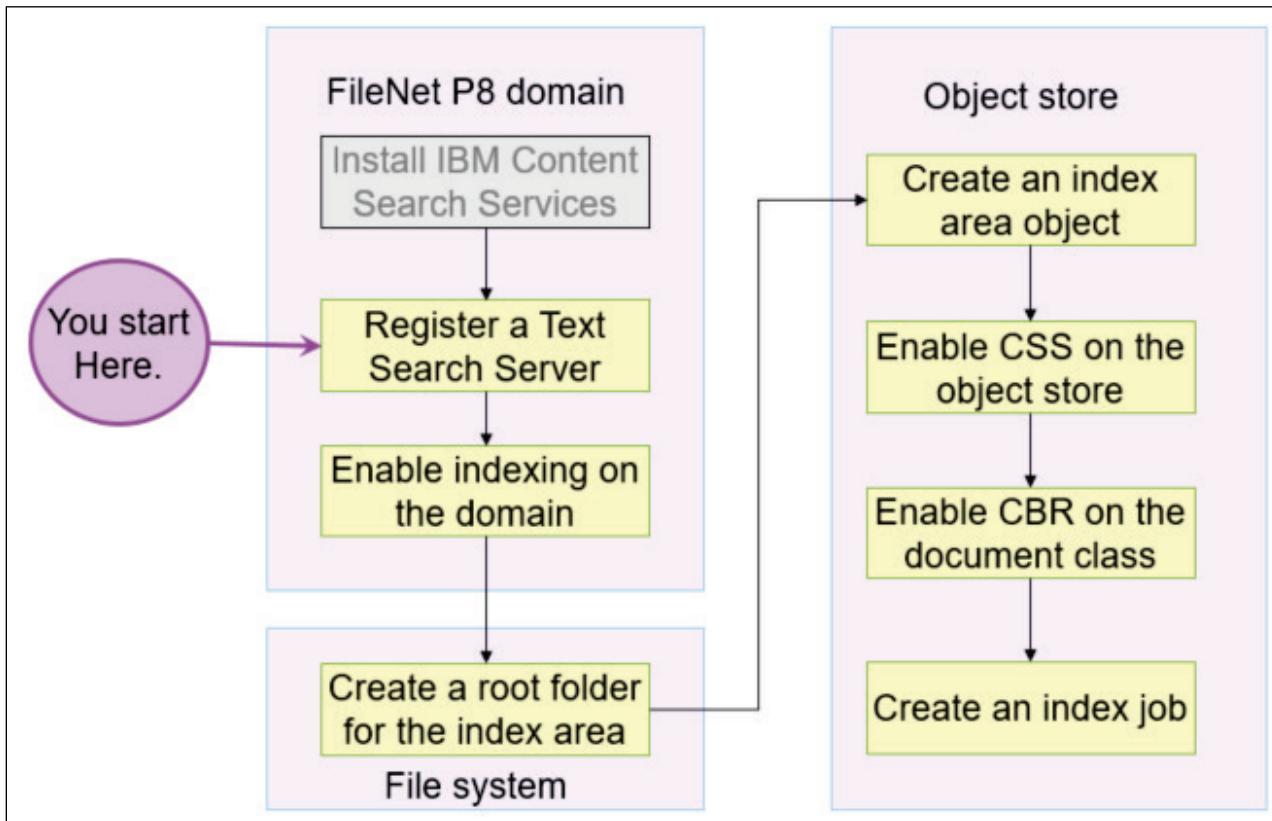


Content Based Retrieval searches the index file, not the actual documents

## Steps to configure content-based retrieval

This section provides high-level steps for configuring content-based retrieval and enabling content-based searches.

The diagram below summarizes the configuration for the content-based retrieval.



- **Install IBM Content Search Services (CSS)**

In a production environment, you typically install CSS on its own server. At the completion of the installation wizard, the authentication token is displayed. Record the authentication token so that you can use it when you register the server with the P8 Domain.

CSS is already installed on your student system.

- **Register the CSS server as a Text Search Server on the P8 Domain**

You must have the authentication token when you register the CSS server with the P8 Domain. If you did not get the token during installation, you can request it from the server using a command.

- Enable indexing at the domain level (or site level)  
Sites inherit their settings from the domain, so if you enable indexing at the domain level, it is enabled for all sites unless you choose to override the settings for any particular site.
- Create an index area on a shared file system  
Avoid the root directory where the file stores exist to avoid disk I/O bottlenecks.
- Create an index area on the object store  
The index area has a pointer to the root directory on the file share. The index area object is also where you configure the index size parameters.
- Enable IBM Content Search Services on the object store  
You select the Indexing language and select the partitions if you have them. The index area must exist before you can enable IBM Content Search Services on the object store.
- Enable CBR on the document class  
You must enable CBR on each document class that you want to index. You can index subclasses at the same time.
- Create an index job  
You initiate the index job on the document class. Schedule index jobs to run during off-peak usage hours. Index jobs can be expensive in time and resources.

# Activity: Register IBM Content Search Services

IBM Content Search Services (CSS) manage content-based indexing and searching tasks. In this section, you will learn how to obtain the Content Search Services authentication token, and then use that token to create a text search server.

In this activity, you will accomplish the following:

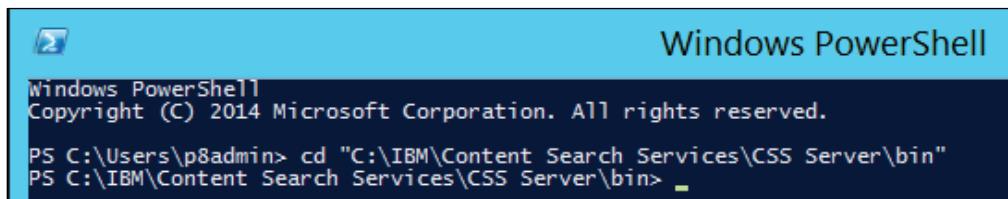
- Obtain the authentication token.
- Create a text search server.
- Verify the indexing on P8 Domain.
- Verify indexing at the site level.

## Obtain the authentication token.

The IBM Content Search Services (CSS) server uses a security token to identify itself with Content Platform Engine. The authentication token is displayed on the CSS installation window. Because the activities in this course do not perform the CSS installation, you will obtain the authentication token by using a command-line request.

- Ensure that the IBM FileNet P8 Platform components are started.  
If you have not started them earlier, start the components by using the earlier activity: *Prepare your system - Start IBM FileNet P8 Platform*.
- Click **Start** and then click **Windows Powershell** to open the command prompt window.
- Change directory to: "**C:\IBM\Content Search Services\CSS Server\bin**"

In Windows Explorer, browse to the folder. In the Windows Powershell window, type cd, press space, drag the folder path from Windows Explorer to the command prompt window, and then press Enter. Since there are spaces in the folder path, make sure quotes are added to the folder path.



```
Windows PowerShell
Copyright (C) 2014 Microsoft Corporation. All rights reserved.

PS C:\Users\p8admin> cd "C:\IBM\Content Search Services\CSS Server\bin"
PS C:\IBM\Content Search Services\CSS Server\bin>
```

- Type the following command and press enter:

```
.\configTool printToken
```



The screenshot shows a Windows PowerShell window titled "Windows PowerShell". The command ".\configTool printToken" was run from the path "C:\IBM\Content Search Services\CSS Server\bin". The output displays two tokens: "weR/vMk=" and "weR/vMkChHEkmFV6xp3tw==". A message indicates that the authentication token is used for communication with the server and should be stored, while the encryption key is used for password encryption during index backups.

```
Windows PowerShell
Copyright (C) 2014 Microsoft Corporation. All rights reserved.

PS C:\Users\p8admin> cd "C:\IBM\Content Search Services\CSS Server\bin"
PS C:\IBM\Content Search Services\CSS Server\bin> .\configTool printToken
The authentication token is printed below. This token is used to communicate with the server. Store
ble.
weR/vMk=
The encryption key is printed below. This key is used to encrypt the password during text index back
ups. Store the key if applicable.
weR/vMkChHEkmFV6xp3tw==
PS C:\IBM\Content Search Services\CSS Server\bin>
```

- Save the authentication token from the screen output (**weR/vMk=**) in a text file. The token is case-sensitive.  
Ensure that you get the first value for the authentication token because the encryption key is also displayed.
- Minimize the command window.

## Create a text search server.

You need to register the IBM Content Search Services (CSS) server with the P8 Domain. You can register the server in Index mode, Server mode, or Index and Server mode. Because you will configure only one server on the student system, the server must perform both index and search operations.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **EDU\_P8 > Global Configuration > Administration** node and then click **Text Search Servers**.
- From the **Text Search Servers** tab, on the right pane, click **New**.
- Type **EDU CBR Server** for the **Display name** field and then click **Next**.
- Complete the fields with the following values:

- **Server State** section
  - Mode: **Dual: Index and Search**

Dual mode runs both indexing and search services. If you have multiple search servers, you can dedicate them to a specific role.
  - Status: **Enabled**

When you need, you can disable the status to prevent the submission of index or search requests to the server.
- **Server Parameters** section
  - Host Name: **vclassbase**

The computer that hosts the search server.
  - Port: **8191**

The default value is 8191.
  - Authentication token: **weR/vMk=**

The <authentication token> value you got earlier.
- Click **Next** and then click **Finish**.

Wait for the process to complete.
- On the **Success** page, click **Close**.
- In the **Text Search Servers** tab, click **Refresh**, verify that **EDU CBR Server** is listed, and then close the **Text Search Servers** tab.

Troubleshooting tips: If the value for the Authentication token is incorrect, the creation of the text search server fails and the error message: *The Content Engine server cannot connect to the IBM Content Search Services server <the Display name you entered> located on host vclassbase, port 8191.*

If you receive a similar error, click **OK**, click **Back** on the New Text Search Server tab, and then edit the token value and complete the wizard.

## Verify indexing on P8 Domain.

You can configure parameters that govern the way that Content Platform Engine performs content-based retrieval functions at the domain and site levels. Unless otherwise specified, each site inherits the domain level settings.

- From the **EDU\_P8** tab, on the right pane, open the **Text Search Subsystem** tab. Use the forward and backward arrows to shift the tabs to get to the Text Search Subsystem tab. You can click the down arrow on the right end and then select the tab directly.
- From the **EDU\_P8** tab, click **Refresh** and then verify that the **Enable indexing** (checkbox) option is selected.

The screenshot shows a configuration interface for the Text Search Subsystem. At the top, there are navigation links: 'System' (with a left arrow), 'Content Cache Subsystem', and 'Text Search Subsystem' (which is underlined, indicating it is active). Below these, there is a button labeled 'Import Settings...'. A descriptive text block states: 'For this server hierarchy level and object, optimize the efficiency of the text search searching text.' Underneath this text is a checkbox labeled 'Enable indexing' with an information icon (a blue circle with an 'i') next to it. The checkbox is checked.

- Scroll down and then inspect the **Searching**, **Indexing**, **Extracting**, and **Schedule** sections. These values can be customized to improve performance.

## Verify indexing at the site level.

Indexing is enabled at the domain level, but you must ensure that indexing for the site is also either inherited from the domain or configured separately.

- On the left pane of the **EDU\_P8** tab, expand the **EDU\_P8 > Global Configuration > Administration > Sites** node and click **Initial Site**.

- From the **Initial Site** tab on the right pane, open the **Text Search Subsystem** tab, click **Refresh**, and verify that the **Configuration** source has **EDU\_P8** (P8 domain) value.

The screenshot shows the administration console for the 'Initial Site'. The top navigation bar includes 'System' and 'Content Cache Subsystem' tabs, with 'Text Search Subsystem' currently selected. A 'Import Settings...' button is visible. Below the tabs, a note states: 'For this server hierarchy level and object, optimize the efficiency of the text search searching text.' Under 'Configuration source', there are two options: 'EDU\_P8 (server hierarchy object)' (selected, indicated by a blue circle) and 'Initial Site (this object)' (indicated by a red circle). At the bottom left, a checked checkbox labeled 'Enable indexing' is shown.

- Scroll down and then inspect the **Searching**, **Indexing**, and **Extracting** sections. The values for the sections are set at the domain level and are not editable at the Site level. If you choose to override them at the site level, then they become editable.
- Log out of the administration console and close the browser.

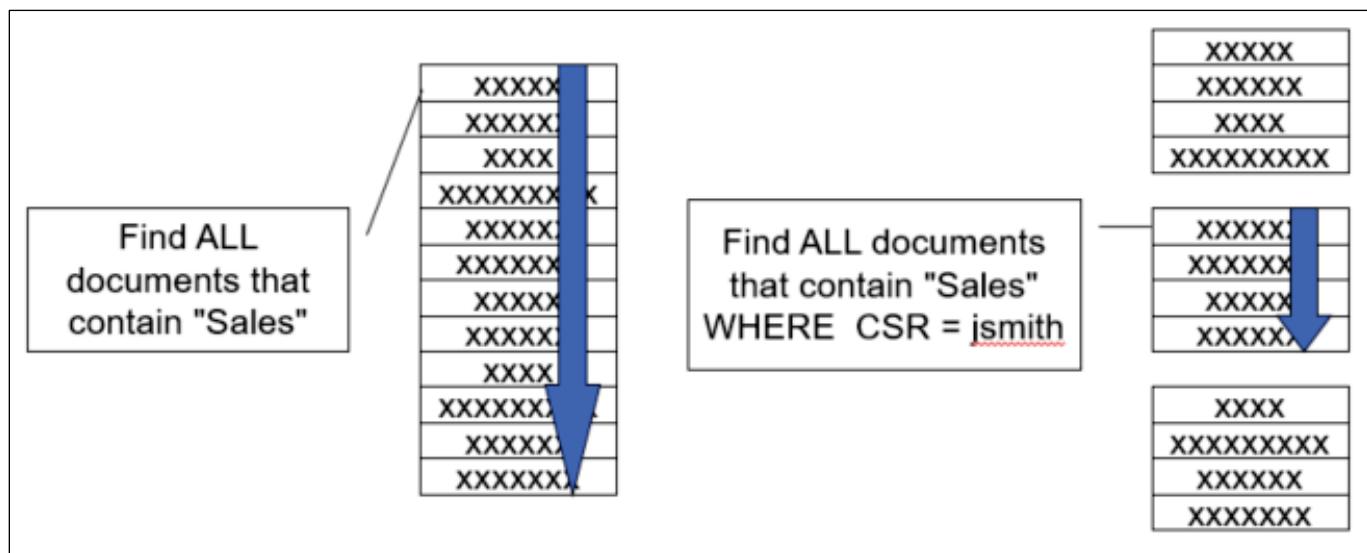
# Configure index partitioning

In this section, you will learn about configuring index partitioning to improve the content-based retrieval (CBR) query performance for FileNet P8 Platform.

## What is index partitioning?

Index partitioning is grouping objects into separate indexes that are based on the value of an object property. Such a property is called a partition property. An index partition can reduce the amount of index information that must be searched by breaking up the index into smaller indexes based on a property value.

In the following diagram, the first search (on the left) is for all documents in an object store that contains the phrase Sales. Without an index partition, the entire index is searched for the relevant documents. In the second example, on the right, the index is partitioned by the customer service representative (CSR) property. To be effective, the search must include a value for the CSR property, such as jsmith. When the search is run, only the index partition for jsmith is searched as indicated by the blue arrow.



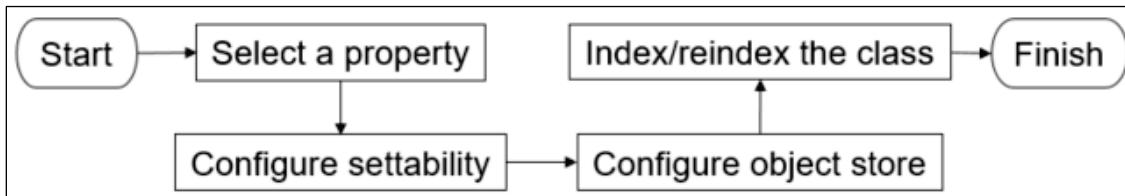
Partitioning indexes potentially improves CBR query performance by reducing the amount of index information that must be searched. The potential query performance gain applies only when the partition property is referenced in the WHERE clause of the CBR query.

## Configure index partitioning

Create the index partition on the object store before you create the index. Otherwise, you must reindex the class. Only one string-valued property and one date property can be configured for each object store.

Properties must be set to SETTABLE\_ONLY\_ON\_CREATE (represented by integer value 2) in Administration Console for Content Platform Engine to be selected as an index partition.

The following diagram lists the steps required to complete the index partitioning:



### Select a string property for an index partition

A string property must be carefully chosen for the index partition to be effective. A good index partition can improve search efficiency for properties that are often used in searches, but has no effect otherwise. If you change the index partition later, you must reindex.

Following are the guidelines for selecting a string property. The property:

- must be a custom property
- must be settable only on create

If the property value is changed after the document is created, it will not be effective.

- is often used in searches

The index partition is only applied when the property is specified in a search.

- has a few possible values

If the value is unique, it will create numerous indexes which will be inefficient. An example scenario is the value for the product ID property that is unique for each product document.

## Use a date property for a partition

You can use a date/time type property for the index partition if the property is commonly used in searches. For example, suppose that you want to partition documents that belong to an email class based on the received date.

Date-partitioned indexes have an associated range of date values for the partition property.

An object store has two date partition-related properties for configuration:

- Date partition property
- Date partition interval

For example, set the interval to one month (1 May 2019 to 1 June 2019) to partition the index by month.

Documents that are added during a particular month are indexed in that month's partition. A search that includes a date searches only the documents that were indexed within that month interval.

For more information on this option, refer to the FileNet P8 Platform V5.5.x Knowledge Center:

[https://www.ibm.com/support/knowledgecenter/SSNW2F\\_5.5.0/com.ibm.p8.ce.admin.tasks.doc/cbr/csscbr\\_date\\_partition.htm](https://www.ibm.com/support/knowledgecenter/SSNW2F_5.5.0/com.ibm.p8.ce.admin.tasks.doc/cbr/csscbr_date_partition.htm)

# Activity: Configure index partitions

You can use index partitions to reduce the amount of work that the system does when it searches the database. You need to select the property for the index partition that will optimize search efficiency. The property must be Settable only on create in order to be configured as an index partition. You can have only one string (and one date type) property partition.

In this activity, you first select a property (string) to use as an index partition, change its setability option, and then configure the property for the index partition. You will also configure a date property as an index partition.

In this activity, you will accomplish the following:

- Select a property for an index partition.
- Change the property setability option.
- Configure an index partition for a string property.
- Configure an index partition for a date property.

## Select a property for an index partition.

For this course, users will be searching mainly for Products. Users often search by product\_id and Product Category, and sometimes by quantity and price.

Read the notes for each of the following properties and then select the property that would make best candidate for a string index partition. Answer is provided at the end of the list.

- **Document Title**

Inherited from the Document class

String data type

Values are mostly unique

Occasionally used in searches

- **ID**

System property

ID data type

Globally unique identifier

Never used in searches

- **Mime Type**

System property

String data type

A few possible values

Never used in searches

- **product\_id**

Custom property

String data type

Values are unique

Often used in searches

- **Product Category**

Custom property

String data type

A few possible values

Often used in searches

- **Quantity**

Custom property

Integer data type

Several possible values

Sometimes used in searches

- **Price**

Custom property

Float data type

Several possible values

Sometimes used in searches

- **service\_date**

Custom property

DateTime data type

Several possible values

Sometimes used in searches

The correct answer is: **Product Category**

**Product Category** is a custom property, String type, often used in searches, and contains a few possible values.

## **Change the property setability option.**

A property must be Settable only on create in order to be configured as an index partition. In Administration Console for Content Platform Engine, the Settable only on create option is represented by the value 2. You must set this attribute on the property template (not the property definition on a particular class) for all classes that use this property template to be indexed with this partition. In this task, you will change the property setability option.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **Sales** object store.
- From the **Sales** tab, expand the **Sales > Data Design** node on the left pane and then click **Property Templates**.
- From the **Property Templates** tab, type **Product Category** on the filter field and then click the **Product Category** link to open the property template.

- From the **Product Category** tab, open the **Properties** subtab and then change the **Settability** value to **2** (two).

The default value was 0.

Property Template: Product Category			
General	Properties	Audit History	Security
<a href="#">Learn more...</a>			
◇	<b>Property Name</b>	<b>Property Value</b>	
*			
*	Settability	2	

- Click **Save** and then close the **Product Category** tab.
- From the **Property Templates** tab, click **Refresh** and then close the tab.

## Configure an index partition for a string property.

In this task, you will configure an index partition for a string property.

- From the **Sales** tab on the right pane, open the **Text Search** subtab and then click **Refresh**.
- Scroll down, under the **Index Partitions** section, select **Product Category** from the list for the **String property** field.

Index Partitions <a href="#">i</a>	
Reminder: To implement any changes that you make to the index partition settings, reindex the	
<b>String property :</b> <a href="#">i</a>	<b>Product Category</b> <a href="#">▼</a>
<b>Date property :</b> <a href="#">i</a>	<b>&lt;None&gt;</b> <a href="#">▼</a>

- Click **Save** to save the changes and then click **Refresh**.

## Configure an index partition for a date property.

You can have only one string property partition and one date property partition for each object store. In this task, you will repeat the steps in the previous tasks and practice configuring an index partition for a date property. The service date property belongs to the Service Order class.

- From the **Sales** tab, expand the **Sales > Data Design** node on the left pane and then click **Property Templates**.
- From the **Property Templates** tab, type **service\_date** on the filter field and then click the **service\_date** link to open the property template.
- From the **service\_date** tab, open the **Properties** subtab and then change the **Settability** value to **2** (two).
- Click **Save** and then close the **service\_date** tab.
- Click **Refresh** and then close the **Property Templates** tab.
- From the **Sales** tab on the right pane, open the **Text Search** subtab and then click **Refresh**.
- Scroll down, under the **Index Partitions** section, for the **Date property** field, select **service\_date** from the list.
- Set the **Date property interval** to **1 month**.

Index Partitions	
Reminder: To implement any changes that you make to the index partition settings, reindex the more...	
String property :	Product Category
Date property :	service_date
Date property interval :	1 month

- Click **Save**, log out of the administration console, and then close the browser.

# Configure content-based indexes

In this section, you will learn about configuring content-based indexes and running content-based retrieval searches for FileNet P8 Platform.

## What is an index area?

An index area is a file system folder that contains the indexes that are used for content-based retrieval. Each index area is associated with a particular object store. Multiple index areas can be associated with one object store.

Each index area allows a new root directory to be specified. The root directory that is used to store indexing data is configured as an Index Area object for an object store in administration console. The user that runs CSS processes must have read and write access to the directory.

## Characteristics of objects of the same full-text index

Objects that belong to the same full-text index must share the following characteristics:

- Belong to the same indexable base class or its subclass
- Have the same partition property value (for string data type)
- Have a partition property value within the same date range (for date/time data type)

For each indexed object, one index entry exists in one full-text index with the information for the content elements and any CBR-enabled properties of the object.

## Index area resource status

An index area is in one of the following states:

- Open
 

Only Open index areas allow full-text index creation and index entry creation.  
You can create an index area in the Open or Standby state.
- Closed - You can manually set an index area to the Closed state.
- Full
 

You cannot change the state to Full. You can set the Maximum index count to a number greater than zero so that when that limit is reached, the status changes to Full.
- Standby
 

You can have an extra index in Standby mode so that it can be opened when the first index (in Open state) is full.

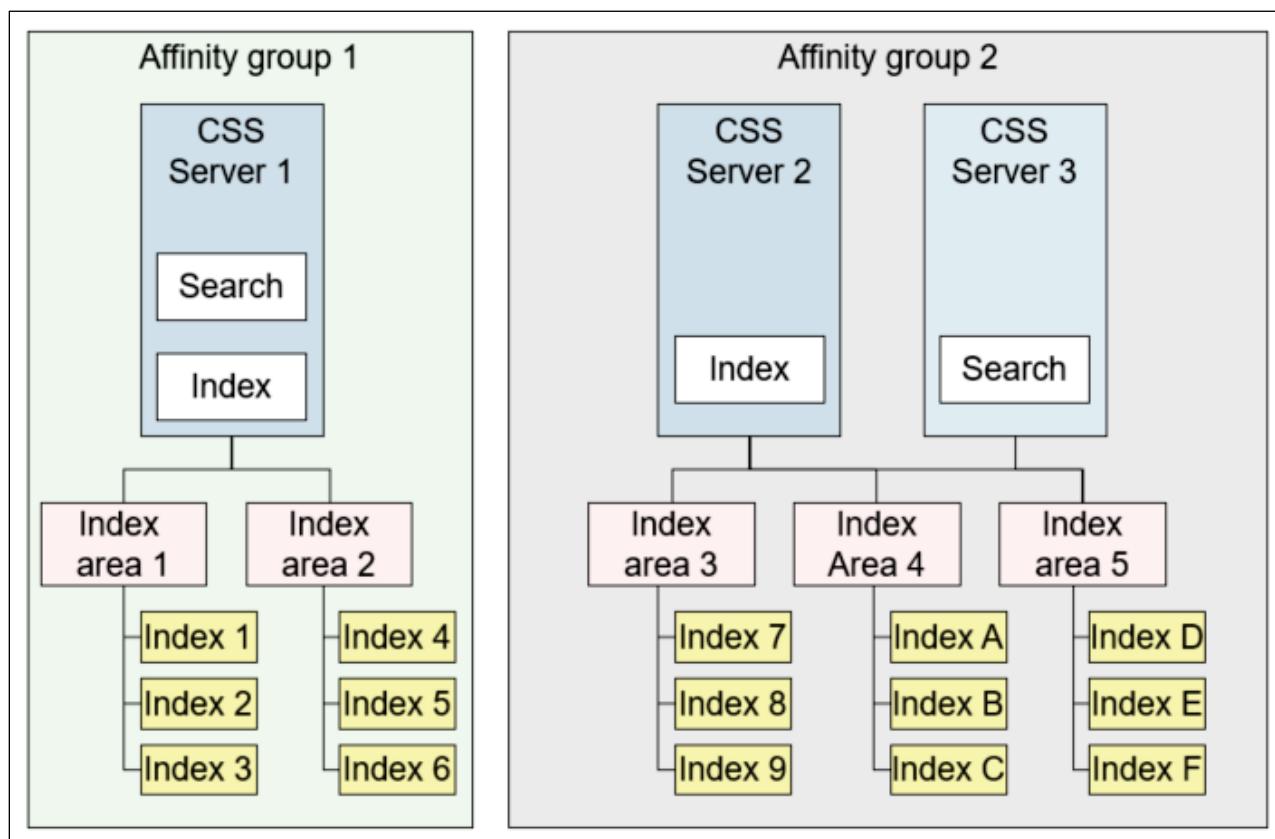
## Use affinity groups to control CSS servers assignment

An affinity group is a group of CSS index servers and index areas.

By default Content Platform Engine (CPE) uses a built-in load-balancing algorithm to assign the CSS servers to indexes automatically according to the indexing workload of the servers. You can override the built-in algorithm by creating affinity groups and manually dedicate the CSS servers to specific index areas. A CSS server in an affinity group serves only indexes that are assigned to that affinity group.

You can use affinity groups to enhance efficiency by assigning indexes to servers that are collocated. The downside is that CPE cannot provide failover. If the local disk that hosts the index area fails, all indexing and search requests to that index area fail.

The diagram shows how affinity groups are used to limit the assignment of indexes to IBM Content Search Services servers.



## Reindex and Resync

You can reindex or resync in the Index subtab of an index area.

If you suspect that the index is corrupted, you can set the index to Unavailable and then reindex. After the index job completes, the index state returns to Open.

The index can become desynchronized if you restore the object store from a backup. You can resync the index. During the resynchronizing process, the system updates the Indexing status to Closed and then after resyncing, the system updates the status to Open.

## Automatic activation of index areas

A Content Platform Engine server automatically changes the resource status for an index area in the following circumstances:

- When an index area or full-text index reaches the maximum, its status changes from OPEN to FULL.  
You can set the capacity of an index area by defining limits.
- When an index area becomes FULL, Content Platform Engine activates another index area that is in STANDBY to OPEN.

The change allows the index area to receive index entries for newly indexed objects. For automatic activation to work, both index areas must be on the same object store. You can specify the activation priority in the administration console. Index areas with the highest activation priority are activated first.

Reduced number of OPEN index areas can result in reduced indexing rates. Automatic activation of STANDBY indexes prevents the reduction of OPEN index areas. The system maintains a steady number of OPEN index areas without manual intervention.

## Index jobs

An index job represents one or more index requests for Content Platform Engine objects. You create an index job on the document class that you want to index. CBR must be enabled on the document class first.

The index job is queued and then runs. Indexing occurs automatically after the index job is queued. Schedule to run index jobs during non-peak hours. Use the Index Jobs Manager to check index progress. Index errors are logged in the P8\_Server\_error.log file.

## Run a CBR search

You can create and run a search from the IBM Content Navigator (ICN) client as well as from the Administration Console for Content Platform Engine (ACCE) tool. Users can use ICN to perform routine searches for their content. Administrators typically use ACCE to find documents in order to perform administration tasks, such as changing metadata or security, or to perform bulk operations.

## **CBR enabled properties**

You can enable properties for CBR. Property values are included in the full-text index.

What are the benefits of enabling properties for CBR?

- A CBR search can provide many query syntax capabilities that a DB search cannot provide, for example phrase, wildcard, synonyms, language processing, grouping.
- A property can be combined with other CBR criteria for a more efficient query.
- Adding a database index might be more expensive than an entry to the full text index.

## **Guidelines for indexing and CBR search**

Following are some guidelines for indexing and CBR search.

- Index only the document subclasses that are going to be searched
- Schedule indexing jobs for non-peak hours
- Reindex when an index failure occurs or when you create an index partition
- Select a property carefully for your index partition
- Include the property, that is used for index partitioning, in the searches
- Be aware that the text that is entered into the content field (for CBR search) in IBM Content Navigator is augmented (Boolean expressions, such as AND and OR are added to the query) before it is sent to the database.

## **Combine CBR and database searches**

A search can include both content and relational database criteria. For example, find all documents with document title LIKE "Test" and that CONTAINS the word "Copyright." CBR searches can sometimes take too long in these circumstances due to too many full-text search hits and too few relational database hits. In the example, all of the documents contain the word "Copyright," but only one document has "Test" in the document title. This search is slow because it retrieves many full-text hits that are not needed.

How does the mixed query works?

In this example, the query statement will be as follows:

```
Select D.This FROM Document D INNER JOIN ContentSearch CS ON
D.This = CS.QueriedObject WHERE D.DocumentTitle LIKE 'Test%' AND
CONTAINS (*, 'copyright')
```

When the query is run, the full text portion of the search retrieves a batch and the batch of full text hits is inserted into a DB Temp table. A JOIN query is issued between the Temp and DocVersion tables. The steps run in many iterations.

## **Optimize the performance of a CBR query**

By default, the Content Platform Engine (CPE) always performs the content-based retrieval (CBR) search first. You can optimize the performance of a CBR query by controlling the order of the database search and the full-text search for the query.

Database-first execution is more efficient in the following circumstances:

- The number of database search hits is small; in the typical case, this number is less than a few hundreds
- The number of full-text search hits is large; in the typical case, this number is more than several thousands

What is Dynamic Switching?

When the property is set to dynamic switching mode, the CPE dynamically determines whether to issue the CBR search first or the relational search on a database (DB) first, optimizing performance for these types of searches.

For every CBR search, an estimate is first made of the full text hit count based on the full text search criteria. If the estimate is larger than a configured threshold, the relational database portion of the search is run first (DB First). Otherwise, the full-text search is issued first (CBR First). The database results are then searched against Content Search Services.

For more information on this option, refer to the FileNet P8 Platform V5.5.x Knowledge Center:

[https://www.ibm.com/support/knowledgecenter/SSNW2F\\_5.5.0/com.ibm.p8.ce.dev.ce.doc/query\\_sql\\_syntax\\_cbr.htm#query\\_optimization\\_icss](https://www.ibm.com/support/knowledgecenter/SSNW2F_5.5.0/com.ibm.p8.ce.dev.ce.doc/query_sql_syntax_cbr.htm#query_optimization_icss)

## Handling requests for ranked results

Users can request search results to be ordered by rank by including the ORDER BY clause in a CBR query. Objects are returned in order of search relevance based on term instance frequency. IBM Content Search Services calculates the value of the Rank property for each returned object. Rank order can be calculated only when the search is CBR-first.

Following are the options to specify how requests for ranked results are handled:

- Grant always:

The server always runs CBR-first searches if rank order is requested.

- Grant conditionally:

CBR-first searches are ordered by rank.

DB-first searches are not ordered by rank.

- Grant never:

Searches are not ordered by rank.

This option can boost performance.

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# Activity: Configure content-based indexes

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In this section, you will create an index area, enable content-based retrieval (CBR), and configure content-based indexes.

In this activity, you will accomplish the following:

- Configure an index area.
- Enable IBM Content Search Services on the object store.
- Enable CBR on the document class.
- Create an index job and check its progress.
- View the index properties.
- View the index in the file system.

## Check the content-based search feature

In this task, you will check the content-based search feature in IBM Content Navigator (ICN) desktop.

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: <http://vclassbase:9081/navigator>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- In the ICN Sample Desktop, click **Browse** on the upper left of the page and then select **Search** from the list.
- On the **Search** page, click **LoanProcess** on the upper right of the page and then select the **Sales** repository from the list.
- From the left pane, click **New Search > New Search**.

- Verify that the interface does not yet show the options for content based search yet.

New Search ×

Search Criteria

Search in: \Sales (Including subfolders) ▾

Class: Document (Including subclasses) ▾

Search options: Documents, Released version

Document Title ▾ ⓘ Starts With ▾

Add Property Show All Properties Property options: Match all

Search Reset Save Save As... Cancel Results Display

Keep search criteria open

Display all properties

- Log out of the ICN desktop and close the browser.

You will configure the content-based retrieval for the Sales object store and test in ICN later.

## Create an index area.

The index area (that will contain the indexes) must be created in a file system location. The folder location must exist before you can create the index area object in the administration console. The IBM Content Services Server user must have full access to the folder. For this course, p8admin is used for the IBM Content Services Server user. If p8admin has insufficient permissions on this folder, the index area creation process fails.

- In **Windows Explorer**, create the following folder: **C:\p8admin**  
Ensure that the folder allows the CSS Server account user full access in the next few steps.
- Right-click the **ProductIndex** folder and select **Properties**.
- On the **Properties** window, open the **Security** tab and then click **Edit**.
- On the **Permissions** window, click **Add**.
- On the **Select Users** window, type **p8admin** in the **Enter the object names to select** field and then click **Check Names**.

- If you are prompted with the **Multiple Names Found** window, select **p8admin** and then click **OK**.
- Back on the **Select Users** window, verify that the name **p8admin (p8admin@edu.ibm.com)** is displayed and then click **OK**.
- Back on the **Permissions** window, select **p8admin (p8admin@edu.ibm.com)** and then select the **Allow** checkbox for **Full control**.  
This steps allow p8admin full control of this folder.
- Click **OK** to save your changes, click **OK** again to close the folder properties page, and then minimize **Windows Explorer**.

In the following steps, you will create an index area object that references the folder that you just created.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **Sales** object store.
- From the **Sales** tab, expand the **Sales > Administrative** node on the left pane and then click **Index Areas**.
- From the **Index Areas** tab on the right pane, click **New**.
- From the **New Index Area** tab, type **Product Index Area** for the **Display Name** field and then click **Next**.

The name that you choose is unimportant but the activities in this section refer to this name.

- For the **Root directory** field, type **C:\ProductIndex** and then click **Next**.  
The folder that you created.
- On the **Summary** page, click **Finish**.
- Wait for confirmation of success and then, on the **Success** page, click **Open**.
- On the **Product Index Area** tab, open the **General** tab and inspect the property values.

The Resource status for the index area is currently in the Open state. You can change the state on this page.

Notice that the root directory field shows the folder path value.

Maximum index count: A threshold that governs when the status of the index area is automatically changed to full. The status is changed when the number of full-text indexes equals or exceeds this threshold. A value of -1 indicates that no threshold applies.

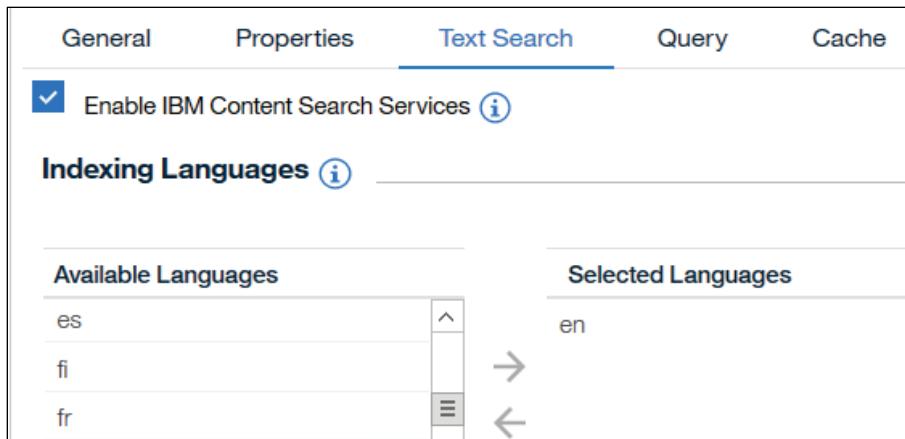
Index maximum object count: A threshold that governs when the status of the index area is automatically changed to full. The status is changed when the number of indexed objects that are assigned to the index equals or exceeds this threshold. A value of -1 indicates that no threshold applies.

- Close the **Product Index Area** and **Index Areas** tabs.
- Leave the administration console open for the next task.

## **Enable IBM Content Search Services on the object store.**

You must enable IBM Content Search Services at the object store level before you can use it for indexing. The Sales object store is open in Administration Console for Content Platform Engine.

- From the **Sales** tab, open the **Text Search** subtab for the Sales object store.
- Select the **Enable IBM Content Search Services** option.
- Under the **Indexing Languages** section, select **en** (for English) from the **Available Languages** list and then click the forward arrow to move **en** to **Selected Languages**.



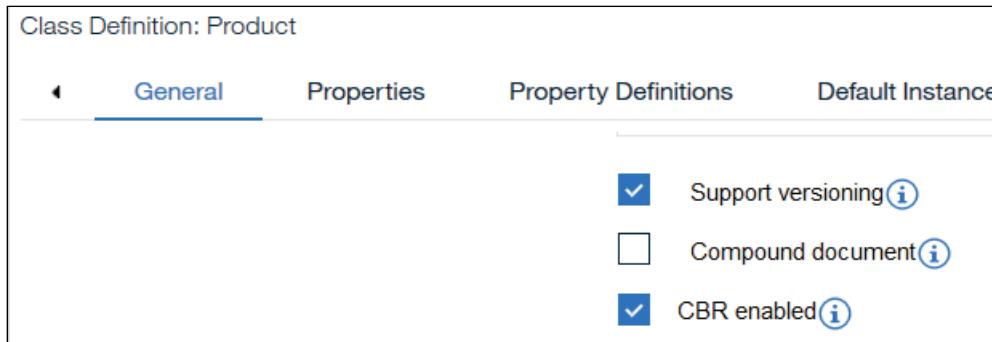
- Click **Save** and then click **Refresh** to ensure that the changes are saved.
- Leave the administration console open for the next task.

## Enable CBR on the document class.

You must enable content-based retrieval (CBR) on a document class. You can enable this option on the root Document class if you want, but if you can more selectively specify only subclasses that need to be indexed, you can shorten the indexing time. In this task, you will enable CBR on the Product class.

You have already signed in to the administration console and the Sales object store is open.

- From the **Sales** tab, expand the **Data Design > Classes > Document** node and then click **Product**.
- From the **Product** tab > **General** subtab, scroll down the page to the **CBR enabled** checkbox and then select the **CBR enabled** option.



If the option is greyed out, it might be because the Enable IBM Content Search Services option that you selected on the Sales object store might not have been saved or refreshed. Repeat the previous task to correct this and then redo this task.

- Click **Save** and then click **Refresh** to save your changes for the document class.
- Leave the administration console open for the next task.

## Create an index job and check its progress.

Indexing is now configured on the Sales object store for the Product document class. The index does not exist until you initiate an index job. When you create an index job, the system creates the index.

The Product document class definition is open in the administration console.

- From the **Product** tab, click **Actions** and then select **Index Class for Content Search (include subclasses)** from the list.
- Click **OK** to close the message that informs you that the system created an index job and close the **Product** tab.

- From the **Sales** tab, expand the **Sales > Administrative** node and then click **Index Jobs Manager**.
- On the **Index Jobs Manager** tab, if the **Job Status** for the **Product** class is **Pending** or **In Progress**, wait for a few minutes and then click **Refresh** again.

The screenshot shows the 'Index Jobs ...' tab selected in the top navigation bar. Below it are three buttons: 'Refresh' (highlighted in blue), 'Batch Operations', and 'Actions'. The main area is a table with columns: 'ID', 'Descriptive Text', 'Job Status', and 'Submitted Count'. There is one row visible, representing a job for the 'Product' class:

ID	Descriptive Text	Job Status	Submitted Count
{E0EE716A-0000-CF1B-8D6E-202F60C8DF01}	DocumentClassDefinition class - Product	Pending	

Indexing can take several minutes. On a production system, the index job might take several hours, so you must plan the index job to run when the system resources are not in high demand.

- Click **Refresh** again until your index job status changes to **Terminated Normally**.

The screenshot shows the same table as before, but the 'Job Status' column now displays 'Terminated normally' for the single row:

{E0EE716A-0000-CF1B-8D6E-202F60C8DF01}	DocumentClassDefinition class - Product	Terminated normally
--	--	------------------------

- Close the **Index Jobs Manager** tab and leave the administration console open for the next task.

## **View the index properties.**

When the indexing job completes, the index area contains an index. In this task, you will view the index properties.

- From the **Sales** tab, expand the **Sales > Administrative > Index Areas** node on the left pane and then click **Product Index Area**.

- From the **Product Index Area** tab on the right pane, open the **Index** subtab and then verify that the **Index Selection** field contains a value.

Index Area: Product Index Area

General Properties Index

**Reindex** **Resync**

The displayed property values are for the selected index.

Index selection :	Sales_Document_20190518083845_8BEC46C59BE
Base classes :	Document
Index identification :	{8BEC46C5-9BEA-482E-830F-4B6A8332C115}

The index selection field contains a set of values in the list. The index identification field shows the first value. If the value is not found, click Refresh.

- Log out of the administration console and close the browser.

## View the index in the file system.

The index job created an index. In this activity, you will verify the index area by going to the location on the file system.

- In **Windows Explorer**, open the **C:\ProductIndex** folder and verify that new subfolders that begins with **Sales\_Document\_XXX\_XXX** is listed.  
XXX is a long string of alphanumeric characters.

The values matches with the ones on the Product Index Area tab > Index subtab in the administration console.

Optionally, explore the contents of this folder. Most of the files cannot be opened with standard viewing tools.

# Activity: Create content-based searches

In this section, you will search the object store by creating searches based on words from within the content elements in the IBM Content Navigator client. You will also create a CBR query in SQL query format and run it in the Administration Console for Content Platform Engine tool.

In this activity, you will accomplish the following:

- Create a content-based search.
- Create a search by using an SQL query.
- Check indexing entries in the log file.
- Configure CBR query optimization options.

## Create a content-based search.

In this task, you will test the content-based retrieval by creating a content-based search in IBM Content Navigator (ICN).

- In the **Mozilla Firefox** browser, click the **Sample Desktop** bookmark or enter the following URL: **<http://vclassbase:9081/navigator>**
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- In the ICN Sample Desktop, click **Browse** on the upper left of the page and then select **Search** from the list.
- On the **Search** page, click **LoanProcess** on the upper right of the page and then select the **Sales** repository from the list.
- From the left pane, click **New Search > New Search**.
- Verify that the **Search in** field has the value: **\Sales (Including subfolders)**.
- For the **Class** field, select **Product** document class, select the **Include subclasses** option, and then click **OK**.
- Type "**Deluxe Model**" (with quotes) in the **Find items with the following terms** field.

- Click the **Text options** link, select the **All of the terms** option and then click **OK**. "Deluxe Model" is changed to "Deluxe AND Model" by ICN when you select the All of the terms for the Text options.
- If you select the *Any of the terms* option, ICN inserts OR and changes to "Deluxe OR Model" for your CBR search.
- With the Proximity option, you can search for terms that must be in proximity to one another. You set the number of words that can separate the terms. Use Advanced operators to include more complex queries with mixed expressions.

**Search Criteria**

Search in:	\Sales (Including subfolders)	▼	Search options: Documents,
Class:	Product (Including subclasses)	▼	
Find items with the following terms: <a href="#">(i)</a>			
<a href="#">"Deluxe Model"</a>			
<b>Text options: All of the terms</b>			

Recall that when you tested the search page before enabling CBR, the *Find items with the following terms* field was not available. Notice that the Text options are available now.

- Below **Text options**, select the following values from the list for the property criteria: **Product Category**, **Equals**, **Combo**

<b>Text options: Any of the terms</b>						
Product Category	▼	(i)	Equals	▼	Combo	▼

This is the property that you used to create index partitioning. This step is optional for CBR search, but it improves the performance because of the number of the documents to be searched is limited with the property value.

If you don't include the property criteria, the number of documents in the search results will be higher.

- Click **Search** (you might need to scroll down to find the Search button).

- Verify that the search returned a few documents.

Showing results for: New Search	
	Name
	Deluxe X.docx
	Deluxe Y.docx
	Deluxe Z.docx

- Right-click a document, and then select **Preview** from the list to open the document in the **Viewer**.
- In the **Viewer**, verify that the document contains the term **Deluxe Model**.

**Deluxe Model X**

Tested and passed, 28 March 2019

- Close the **Viewer**.
- Optionally, you can do more searches, by changing the search term to "**Basic Model**" or **Test** (instead of **Deluxe Model**) and inspect the results.
- Similarly, change the property value to **Basic** or **Deluxe** (instead of **Combo**) and do the search.  
Some combination might not return any results.
- Log out from IBM Content Navigator and close the browser.

## Create a search by using an SQL query.

You might need to run a query in the administrative console for bulk operations and other administrative purposes. In this task, you will create a CBR query in SQL query format and run it.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **Sales** object store.

- From the **Sales** tab, click **Search** on the left pane.
- From the **Saved Searches** tab on the right pane, click **New Object Store Search**.
- From the **New Object Store Search** tab, open the **SQL View** tab and then delete the contents of the **SQL statement** field.
- Enter the following SQL statement exactly as shown:

```
SELECT p.This FROM Product p INNER JOIN ContentSearch c ON  
p.This = c.QueriedObject WHERE CONTAINS(p.* , 'Deluxe AND Model')  
AND p.ProductCategory = 'Combo'
```

You can also copy the text from the C:\Training\F2810G\SQLStatement for Search.txt file and paste it to avoid any typing errors.

- Click **Save As** and then type **Model Content Search** for the **Document Title** field.

Save Query

---

Document title	Model Content Search
Description	

---

**OK**    **Cancel**

You can save the search and then reuse it for later purposes.

- Click **OK** to save and then, back on the **Model Content Search** tab, click **Run**.

- Verify that the query finds and displays the objects.

Simple View    SQL View    Bulk Actions (Disabled)    Search Results X

**Actions** ▼

Search Result Count : 3

	Object Name
<input type="checkbox"/>	Deluxe X.docx
<input type="checkbox"/>	Deluxe Y.docx
<input type="checkbox"/>	Deluxe Z.docx

Troubleshooting tips: If the query returns the error, it is most likely due to the SQL statement that is not entered correctly. Review the message, correct any errors in the query and then rerun the query.

## Check indexing entries in the log file.

Index jobs sometimes generate errors when documents fail to be indexed. The error messages contain enough information for you to find the problem document and identify the cause of the error. When an index job completes, review the log file to check whether any problems occurred. In this task, you will check the log file.

The p8\_server\_error.log file is located in the C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\FileNet\server1 folder. You can find the folder location in the following steps:

- In the **Mozilla Firefox** browser, click the **Bookmarks** menu and then select **System Health > CE Ping**

You can also enter the following URL for the ping page:  
<http://vclassbase:9080/FileNet/Engine>

- The Content Engine Startup Context (Ping Page) page is displayed.
- Scroll down to locate and then copy the value for the **Log File Location** key.
- In **Windows Explorer**, browse to the server1 folder, right-click the **p8\_server\_error.log** file and select **Edit with Notepad++**.
- Scroll to the bottom of the log file and check for any errors or warnings.
- If the configuration and search were completed successfully, there may not be any errors.
- Close the file and then exit **Notepad++**.

## Configure CBR query optimization options on an object store.

In this task, you configure the CBR Query Optimization option for dynamic switching between CBR-first searches and DB-first searches.

- If the administration console is not already open, log in:
  - In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: **http://vclassbase:9080/acce**
  - Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **Sales** object store.
- From the **Sales** tab, open the **Query** subtab.
- In the **CBR Query Optimization** section, select the **Dynamic Switching** option.
- Read the message, then click **OK**.
- In the **Excessive full-text search hits threshold** field, type **1000**.
- Requests for ranked results, select **Grant never** and then click **Save**.

Users can request search results to be ordered by rank. Rank order can be calculated only when the search is CBR-first.

When you select the Grant never option, searches are not ordered by rank. This option can boost performance.
- Log out of the administration console and close the browser.

# Work with sweeps

In this unit, you learn about the sweep management framework and how to configure sweep jobs.

## Sweep Framework

The Sweep Framework is a Content Platform Engine subsystem that provides a mechanism for efficiently examining large sets of objects and applying one or more operations to a user-defined subset. This process is called Sweeping.

Sweep framework services are scalable both by Horizontal scaling (you can increase the number of server instances) and by Vertical scaling (increase the number of worker threads that are dedicated to sweep processing).

The service provides:

- The ability to halt and resume execution without losing context
- Failure recovery
- Error logging and auditing
- Performance monitoring

## What is a Sweep?

A sweep is an instance of a background service that you configure to process objects in a database table. A sweep is like issuing a query, iterating through the results and running an action on each.

Key properties of a sweep are the target class and filter expression. The target class determines the database table that is processed. The filter expression specifies the criteria that the sweep applies to a candidate object in a database table. If the object satisfies the criteria, the sweep processes the object; otherwise, the object is ignored.

You can use either a system sweep that performs actions that are built into the server, such as moving or deleting content, or a custom sweep which performs actions that are defined and implemented by a user.

## Filter expression property in Sweeps

A filter condition narrows the scope of a sweep to include only objects that meet specific criteria. You can specify a filter expression for all the system sweep jobs. The filter expression can use one or more properties of the Target Class. For example, if the document has a property that is called color and the property cab take the values red, green, and blue, you can create a filter expression for this property: color = 'green'

The syntax is similar to the Where clause of an SQL query. Following is an example of a filter expression that can be used in a Bulk Content Move job:

```
DateCreated < NOW() -TimeSpan(365, 'Days')
```

This expression filters all documents that were created at least a year ago.

For a list of examples of filter expressions, refer to the IBM FileNet P8 Platform V5.5.x Knowledge Center:

[https://www.ibm.com/support/knowledgecenter/en/SSNW2F\\_5.5.0/com.ibm.p8.ce.admin.tasks.doc/p8pcc178.htm](https://www.ibm.com/support/knowledgecenter/en/SSNW2F_5.5.0/com.ibm.p8.ce.admin.tasks.doc/p8pcc178.htm)

## Type of Sweeps

The sweep subsystem supports the following types of sweeps:

- Job sweeps - run one time to process instances of a target class
- Sweep policies

A sweep policy is an object that specifies processing rules for a policy-controlled sweep. A policy-controlled sweep repeatedly visits all instances of a target class that are specified in the policy.

- Queue sweeps - provide a generic queuing service. They are especially useful in controlling the flow of work to a slow or resource-intensive process.
- Custom sweeps - process objects with user-implemented actions
- Background search sweeps - run one time to execute a query that generates search results

## Job sweeps

Jobs sweeps have a definite start and end:

- Starts when the first candidate object is examined
- Ends when each candidate object is examined exactly one time
- Cannot be restarted after it ends.

You can clone the original instance and run the new instance.

The Content Platform Engine includes the following job sweeps with built-in actions.

- Bulk Move Content Jobs - Move large numbers of documents and annotation from one storage area to another.

Before you create a bulk move content job, you must decide what objects to move, where you want to move them to, and when you want to move them. Following are some use cases for a bulk move content job:

- Retire an obsolete storage device by moving all the content to a replacement device
- Archive content by moving it from a primary storage device to an archival device or lower-cost storage
- Move content to fixed storage to satisfy regulatory requirements
- Retention Update Jobs - Change the retention period of an object based on the class of an object or the state of its properties.
- Thumbnail Generation Jobs - Create thumbnail generation requests for existing documents. The Content Platform Engine includes a thumbnail generation service, the thumbnail generation sweep job creates requests to the thumbnail generation service to render the thumbnail images.
- Custom jobs - Process objects in ways that are not built into the server. Requires that you define a custom action. The action requires a developer to write an action handler.

## **Background search sweeps**

The background search sweeps are designed for long-running queries, including queries in which you want to perform special operations such as count objects, and find minimum and maximum values. You can proceed with other activities while the background search runs. In addition, background searches are an essential part of the reporting framework that enables processing of search results. To use the reporting framework, you must install the Reporting Enablement Extensions add-on.

The system provides a set of background search class templates. You can also create your own custom search class template.

For more information on how to configure background searches and then create reports and charts to show the results, refer to:

<https://www.youtube.com/watch?v=MWBScDRYJyY>

## Sweep policy

A sweep policy object defines the processing rules including target classes, the filter condition, and the action to be applied. A sweep policy runs continuously. A delay period between iterations and an end time for the sweep to stop running can be configured.

The Content Platform Engine includes several sweep policies with built-in actions.

## Update storage policy option for Move content sweeps

IBM FileNet P8 Platform version 5.5.2 introduces a new update storage policy option for move content sweeps. A Bulk Move Content Job or a Content Migration Policy can be used to move content from a storage device that must be removed from the system infrastructure. For that reason, it is helpful to have the option to update the storage policy for the object during the move, to indicate the new device or location.

By default, in a move-content sweep, the value of the Storage Policy property is retained at the document level. This means that even after a move, a check-out reservation of the document is still assigned to the original storage area. For some move sweeps, however, the current storage location is no longer relevant, such as when you are removing a storage location from your environment. In such cases, you can apply the Update storage policy option when you create a move-content sweep job. This changes the Storage Policy for all the documents that are affected by the move to the new storage location.

In the Administration Console for Content Platform Engine, the creation wizard for a Bulk Move Content Job or a Content Migration Policy includes the new Update storage policy option. You can check the option when creating jobs or policies with the intent to permanently relocate content objects. The new location is then updated in the storage policy of the objects.

You can also update the property value on the property pane of the sweep object.

## Policy-controlled sweep

The policy-controlled sweep object repeatedly examines all instances of a target class that is specified in the policy.

It has a definite start and indefinite completion and continues to run until it is either disabled or deleted. A policy-controlled sweep runs at the start time for which it is configured. If a start time is not set, then the sweep is eligible to start immediately.

A sweep policy and the policy-controlled sweep are two separate objects. A third object that is called the sweep relationship defines the association between a sweep policy and a policy-controlled sweep. In the relationship, the sweep policy is a subscriber to the policy-controlled sweep. A single policy-controlled sweep can be subscribed to by more than one sweep policy. A policy-controlled sweep and a sweep relationship cannot be created directly. They are created indirectly by the server when you create a sweep policy.

## Disposal policy

A disposal policy is used to delete objects of a specified class that satisfy the specified criteria. The criteria can include the state of a property, such as the age of a document. A disposal policy cannot delete objects that are currently under retention.

The disposal policy creator needs WRITE\_ANY\_OWNER permission on the object store.

A disposal policy contains the following details:

- Target class or type of objects that you want to delete (required)
- A filter expression
- Whether to include subclasses of the target class in the list of objects to examine.
- The number of sweep iterations for which to retain results; By default 10 sweep iterations are kept.

Example scenarios of disposal policies:

- Example 1: Delete superseded minor versions after 30 days from last modification, keeping only the latest version, and any older major versions.
- Example 2: Imagine an application that creates temporary folders, which are used as transient containers for documents or subfolders until they are moved to a permanent location. After the folders are empty for at least 24 hours, the disposal policy removes them.

## Authorization option for disposal policy sweeps

IBM FileNet P8 Platform version 5.5.2 introduces a new option to determine the authorization model of a disposal policy sweep. Previously, disposal policy sweeps assumed the authorization of the object owner when attempting to delete an object. However, for most other sweep types the sweep assumes the authorization of the creator of the sweep.

The new option in the disposal policy sweep creation wizard gives you the choice between these two models. You can choose to have the sweep that is run as the owner of each object, or as the owner of the sweep object. Because the owner of the object might not have delete rights, whereas the Admin who created the sweep does have delete rights.

## **Content migration policy**

A content migration policy is used by an administrator to configure an object store to automatically move content from one storage area to another based on age, most recent access, or other business criteria.

Typical use cases for content migration policies:

- Implement simple hierarchical storage scheme where content is moved between high-cost and low-cost storage media based on age or frequency of access.
- Automatically move content to a fixed storage device for regulatory purposes based on business events.
- Incrementally move federated content from a third-party repository into a FileNet P8 storage area.

A content migration policy contains the same properties as a disposal policy plus one more option: End replication after move.

The end replication after move option is a Boolean property that applies when you are federating content and is ignored otherwise. When set, it causes to end the federation relationship with replicas that are stored in the source repository.

## **Content consistency sweep**

In IBM FileNet P8 Platform version 5.5.2, the functionality of the Consistency Checker standalone tool is replaced by the addition of a content consistency sweep job in the Administration Console for Content Platform Engine.

The Consistency Checker standalone tool is installable only on a Windows system. The new Consistency checker sweep job, that is part of the Sweep mechanism, runs within the Administration Console for Content Platform Engine and is supported on all Content Platform Engine platforms.

The capabilities of the general sweep FilterExpression are available to control what documents or annotations are checked. This includes but is not limited to picking out a particular storage area or objects that were created in a particular date range.

The scalability and resilience features of sweeps are also available. This includes setting max workers and batch size, and the ability to tune the query that is used by the sweep. In addition you can use timeslots to schedule when the sweep runs.

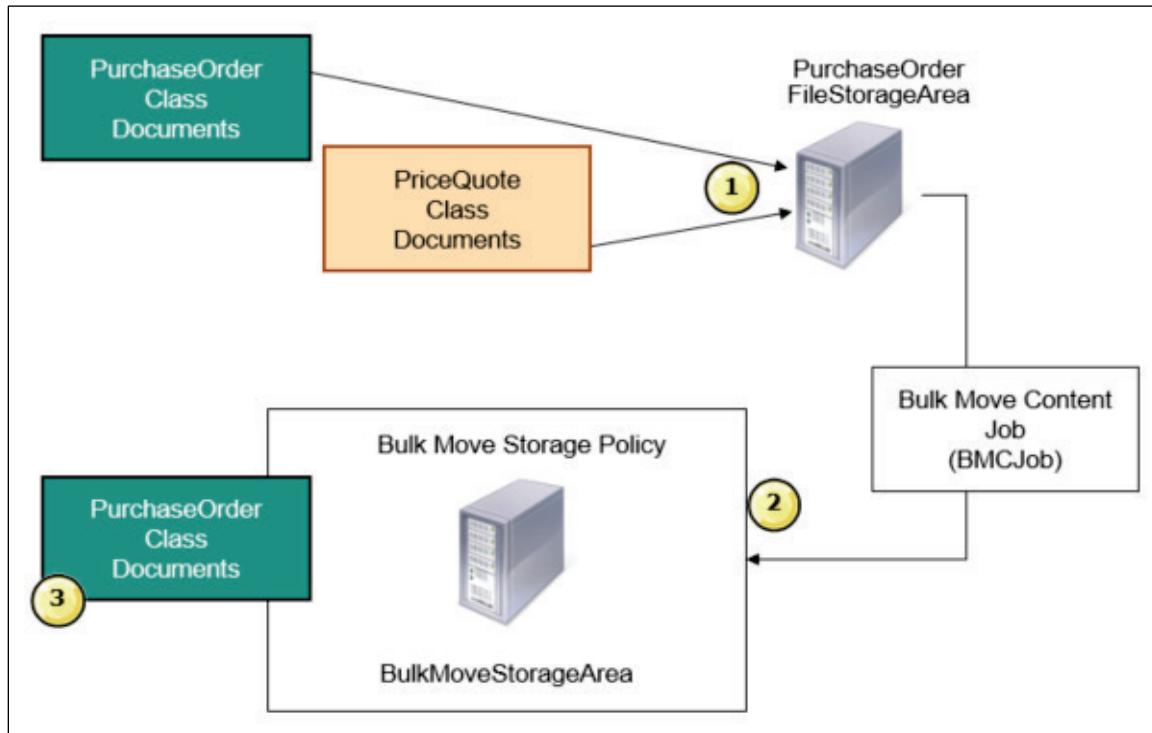
## External content sharing

The Content Platform Engine and the IBM Content Navigator introduce a feature to share content with users that are external to your organization. This feature also includes folder-level sharing and the sharing of objects from external users. This feature is exposed to users through the IBM Content Navigator desktop, and the FileNet P8 administrator must also perform configuration steps to enable the feature.

To enforce the expiration date on shared content, the share feature includes a new sweep and a sweep disposition policy that checks for share instances at specified intervals and takes appropriate actions. You can edit the policy to change the intervals for the sweep actions.

# Activity: Configure a bulk move content job

In this activity, you configure a sweep job (called BMCJob) to do a bulk move of document content from one storage area to another. The following diagram shows the different Content Platform Engine objects that are used in the activity.



1. The content of documents are stored in PurchaseOrderFileStorageArea. The documents belong to the PurchaseOrder and PriceQuote classes.  
You configure a filter expression in your new Bulk Move Content Job (called BMCJob) and specify the source file storage area to filter the documents so that only the documents in that storage area are moved.
2. You specify a storage policy (Bulk Move Storage Policy) that determines the destination storage area (BulkMoveStorageArea) for the content.
3. You specify a Target document class to examine only the documents of the PurchaseOrder class. So that only documents of class PurchaseOrder are moved, and documents of class PriceQuote remain on PurchaseOrderFileStorageArea.

Storage areas (PurchaseOrderFileStorageArea and BulkMoveStorageArea), storage policy (Bulk Move Storage Policy), and document objects of the PurchaseOrder class are already configured on the student system for this activity.

You learned about how to create storage areas and policies in a previous section.

In this activity, you will accomplish the following:

- Examine the file storage areas and storage policies.
- Create a bulk move content job.
- Test the bulk move content job.

## **Examine the file storage areas and storage policies.**

In this task, you will examine the file storage areas, documents, and storage policy before running the Bulk Move Content Job. You will compare file count values after running the job.

- Ensure that the IBM FileNet P8 Platform components are started.  
If you have not started them earlier, start the components by using the earlier activity: *Prepare your system - Start IBM FileNet P8 Platform*.
- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **Sales** object store.
- From the **Sales** tab, on the navigation pane, expand **Sales > Administrative > Storage**, and select **Storage Areas**.
- On the **Storage Areas** tab on the right pane, verify that **PurchaseOrderFileStorageArea** contains 9 (nine) files.

This is the source storage area from where you want to move the content.

- Note the destination storage area, **BulkMoveStorageArea**, contains 0 (zero) files.

	Display Name	Type	Status	Total Files
	Default Database Storage Area	Database Storage Area	Open	10
	BulkMoveStorageArea	File Storage Area	Open	0
	PurchaseOrderFileStorageArea	File Storage Area	Open	9

- From the **Storage Areas** tab, click the **BulkMoveStorage Area** link to open its properties.
- From the **BulkMoveStorage Area** tab, click the **Storage Policies** subtab to view the policy (**Bulk Move Storage Policy**) that is associated with this storage area.

File Storage Area: BulkMoveStorageArea

Configuration	Statistics	<b>Storage Policies</b>	Security		
A storage policy provides mapping to specific physical storage areas and is used to where content is stored for a class or object with content (for example, a document).					
Storage policies :					
<table border="1"> <thead> <tr> <th>Name</th> </tr> </thead> <tbody> <tr> <td>Bulk Move Storage Policy</td> </tr> </tbody> </table>				Name	Bulk Move Storage Policy
Name					
Bulk Move Storage Policy					

You will configure Bulk Move Storage Policy as the destination in the Sweep Job that you create.

- Close the **Storage Areas** and **BulkMoveStorage Area** tabs.
- From the **Sales** tab, collapse the **Administrative** node, expand **Browse > Root Folder**, and then click the **TestBulkMove** folder.
- On the **TestBulkMove** tab, observe that nine documents are listed.
- In the **Class** column, verify that five documents belong to the **PurchaseOrder** class and four documents belong to the **PriceQuote** class.
- From the **Sales** tab, collapse the **Browse** node, expand **Sales > Data Design > Classes > Document**, and then click the **PurchaseOrder** class.
- From the **PurchaseOrder** tab > the **General** subtab, scroll down, and then observe that the **Default storage area** field has the associated storage area (**PurchaseOrderFileStorageArea**).
- Repeat the steps to verify that the **PriceQuote** class also has **PurchaseOrderFileStorageArea** associated with it.
- On the right pane, close all the open tabs.

## Create a bulk move content job.

In this task, you will use the New Bulk Move Content Job wizard to create the job.

- From the **Sales** tab, expand **Sales > Sweep Management > Job Sweeps**, observe the jobs available, and then select **Bulk Move Content Jobs**.
- From the **Bulk Move Content Jobs** tab on the right pane, click **New**.
- From the **New Bulk Move Content Job** tab, on the **Define Bulk Move Content Jobs** page, type **BMCJob** for the **Display name** field.
- Scroll down and then, for the **Sweep mode** field, select **Normal** from the list. Sweep mode can have the following values: Normal, Preview, or Preview only counters. The Preview mode is useful for testing the filtering expression criteria without running any actions on the selected objects.
- Select the **Enable bulk move content job** option.

Description : 	BMCJob
* Sweep mode : 	Normal
<input checked="" type="checkbox"/> Enable bulk move content job 	

- Click **Next** and then on the **Define Sweep Targets** page, for the **Target class** field, select **PurchaseOrder**.
- For the **Filter expression** field, build the expression in the following steps:
  - On the navigation pane, expand **Sales > Administrative > Storage > Storage Areas** and then click **PurchaseOrderFileStorageArea**.
  - From the **PurchaseOrderFileStorageArea** tab on the right, on the **General** subtab, copy the GUID value in the **ID** field.
  - In **Notepad**, build the following expression by using the GUID value: **StorageArea=OBJECT('{GUID}')**
  - Replace GUID with the value that you copied.

Type the value exactly as shown and verify that no typing errors are in the filter expression statement. It is case-sensitive and extra spaces are not allowed. Make sure to use single quotation marks, and no smart quotes, or no double quotation marks.

- On the **New Bulk Move Content Job** tab, for the **Filter expression** field, paste the expression that you built.

* Target class : <a href="#">(i)</a>	PurchaseOrder
Filter expression : <a href="#">(i)</a>	<code>StorageArea=OBJECT('70DC8764-0000-C31D-8F57-1728C2DFD000')</code>

This expression filters the documents in this Storage Area to move.

Save the expression on the Notepad, you will be using for a later task also.

- For the **Storage policy names** field, select **BulkMove Storage Policy**.
- Set the following options:
  - Include subclasses: **Not Enabled**
  - End replication after move: **Not Enabled**
  - Update storage policy: **Not Enabled**
  - Record Failures: **Enabled**

* Storage policy names : <a href="#">(i)</a>	<b>Bulk Move Storage Policy</b>	
Include subclasses :	<input type="checkbox"/>	Enabled
End replication after move :	<input type="checkbox"/>	Enabled
Update storage policy :	<input type="checkbox"/>	Enabled
Record failures : <a href="#">(i)</a>	<input checked="" type="checkbox"/>	Enabled

The update storage policy option (new to FileNet P8 Platform V5.5.2) is used when you move content from a storage device that must be removed from the system infrastructure. This option updates the storage policy, for the object during the move, to indicate the new device or location. So that if the document is checked out, the check in will not automatically use the original storage policy.

- Click **Next** and then on the **Define Bulk Move Content Job Dates** page, type today's date for the **Effective start date** field.

For example, 4/10/2019. After typing, click in the next field or outside of the current field for the system to automatically format the date.

- Type tomorrow's date for the **Effective end date** field.

Example: 4/11/2019

- Edit the start time to the current time of the image + 2 minutes.  
Make sure to change AM to PM if necessary.

#### Define Bulk Move Content Job Dates

If you want to modify the bulk move content job while it is running, specify that the modifications take effect over a span of time.

Effective start date :

April 11, 2019 at 3:37:00 AM Eastern Daylight Time

Effective end date :

April 12, 2019 at 12:00:00 AM Eastern Daylight Time

- Edit the stop time, change AM to PM, and then click **Next**.
- On the **Summary** page, review the information and then click **Finish**.
- On the **Success** page, click **Close**.
- From the **Bulk Move Content Jobs** tab, click **Refresh** and then verify that the new sweep job (**BMCJob**) is listed.

Troubleshooting tips: If the Filter expression value has an error, the wizard does not create the Job and it shows an error. In the example used here, notice that the expression is missing a single quotation before the start of the GUID.

StorageArea=OBJECT({70DC8764-0000-C31D-8F57-1728C2DFD000})'

With this filter expression, when you try to finish the wizard, you will get an error as shown in the following screen capture:

Bad filter expression "StorageArea=OBJECT({70DC8764-0000-C31D-8F57-1728C2DFD000})".  
Message was: Lexical error at line 1, column 61. Encountered: after : "\'"

To fix the format, click **OK** to close the Error window. Click **Back** in the wizard, correct the Filter expression value, and complete the wizard.

## Test the bulk move content job.

In this task, you will examine the properties of the bulk move content job you created and also examine the file storage areas for their file count after running the bulk move content job. You compare these values with the ones before running the job.

- From the **Bulk Move Content Jobs** tab, click **BMCJob** to open the job that you created.
- On the **BMCJob** tab, click **Refresh**.
- In the **General** tab, scroll down and observe the values for the **Sweep start date** and **Sweep end date** fields.

Sweep start date :	 April 11, 2019 at 3:42:53 AM Eastern Daylight Time
Sweep end date :	 April 11, 2019 at 3:42:55 AM Eastern Daylight Time

- Verify that **Examined object count** and **Processed object count** are **5**, and **Failed object count** is **0**.

It might take a few minutes for the Sweep Job to complete. If the results are not displayed, wait a couple of minutes and click Refresh again.

If the Sweep start and end date fields are blank even after fifteen minutes, the sweep job did not run. Verify that the Effective start and end dates are correct.

If the Sweep start and end dates are not blank, but the Processed object count=0, verify that the filter expression is correct.

- In the **Sales** tab, on the navigation pane, expand **Sales > Administrative > Storage**, and select **Storage Areas**.
- In the **Storage Areas** tab, click **Refresh** and then verify the target storage area (**PurchaseOrderFileStorageArea**) now contains only four files (instead of nine) and the destination storage area (**BulkMoveStorageArea**) contains five files.

 BulkMoveStorageArea	File Storage Area	Open	5
 PurchaseOrderFileStorageArea	File Storage Area	Open	4

When you run the Bulk Move Content Job (BMCJob), the content for the five documents of the PurchaseOrder class is moved from the PurchaseOrderFileStorageArea to the BulkMoveStorageArea.

The four documents of the PriceQuote class are not moved and are still in the storage area, PurchaseOrderFileStorageArea.

You can also search for the documents of the PurchaseOrder target class that is used for the bulk move content job, and verify that their Storage area value is changed.

In the following screen capture, the PurchaseOrder1 document was opened from the TestBulkMove folder. On the Properties tab, observe that its Storage area now is BulkMoveStorageArea.

The screenshot shows the 'Properties' tab selected for the document 'PurchaseOrder1, Version: 1.0, Status: Released'. The 'General' tab is visible but not selected. The 'Properties' tab has a blue underline. Below the tabs, there is a 'Learn more...' link. The main content area displays a table with two columns: 'Property Name' and 'Property Value'. The 'Property Name' column contains 'Storage Area' with a red asterisk indicating it is a required field. The 'Property Value' column contains 'BulkMoveStorageArea'. The entire interface is contained within a light gray border.

Property Name	Property Value
Storage Area	BulkMoveStorageArea

- Log out of the administration console and close the browser.

# Activity: Create a disposal policy

In this activity, you create and configure a disposal policy to delete certain objects. You specify a target class and a filter expression so that only documents of that particular class that satisfy the filter expression are deleted. You test the disposal policy by verifying the processed object count and the documents in the folders.

In this activity, you will accomplish the following:

- Examine documents and file storage areas.
- Create a disposal policy.
- Test the disposal policy.

## Examine documents and file storage areas.

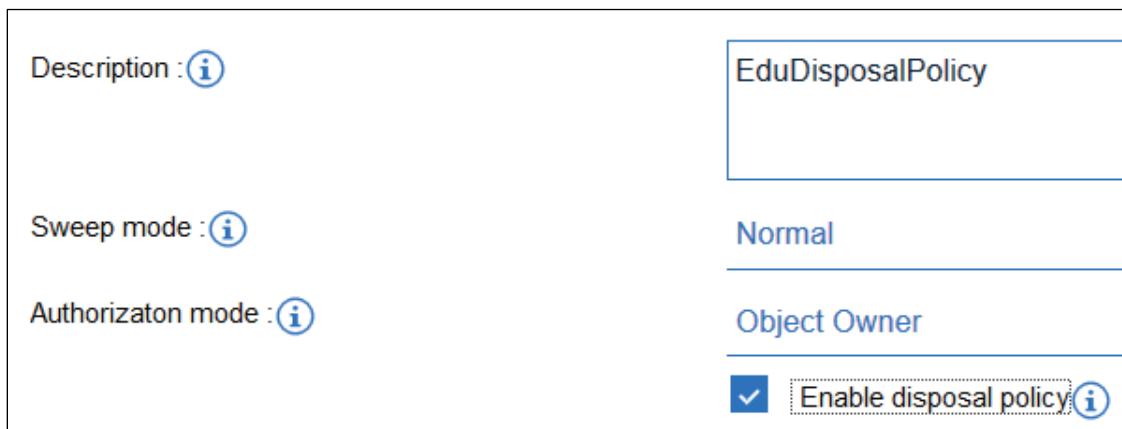
In this task, you will examine the number of documents in the object store folder before running the disposal policy. You will also examine the file storage area, PurchaseOrderFileStorageArea, for its file count. You will compare the documents and the file count after running the policy.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **Sales** object store.
- From the **Sales** tab, on the left pane, expand **Sales > Browse > Root Folder** and click **TestBulkMove** to open the folder.
- On the **TestBulkMove** tab, observe that nine documents are listed.
- In the **Class** column, verify that four documents belong to the **PriceQuote** class.  
The four documents are stored in PurchaseOrderFileStorageArea.
- Close the **TestBulkMove** tab.
- On the left pane, collapse the **Browse** node and then expand **Sales > Administrative > Storage** and then click **Storage Areas**.
- From the **Storage Areas** tab on the right pane, verify that the **PurchaseOrderFileStorageArea** (from where you want to delete the files) contains four files.
- Close the **Storage Areas** tab.

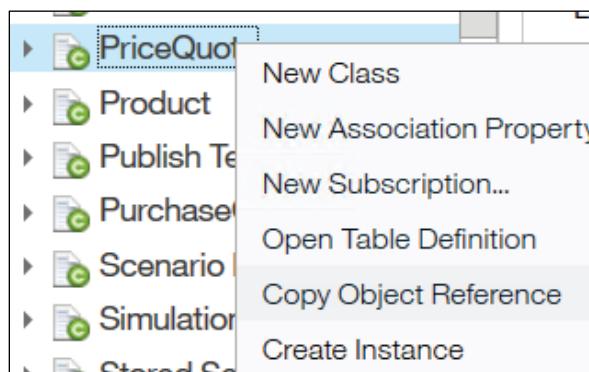
## Create a disposal policy.

In this task, you will create a policy by using the New Disposal Policy wizard.

- On the left pane, collapse the **Administrative** node and then expand the **Sweep Management > Sweep Policies**, and then click **Disposal Policies**.
- From the **Disposal Policies** tab on the right pane, click **New**.
- In the **New Disposal Policy** tab, type **EduDisposalPolicy** for the **Display Name** field.
- Scroll down, select **Normal** for **Sweep mode**, and select the **Enable disposal policy** option.



- Leave the default value (**Object Owner**) for the **Authorization mode** field. You also have a new option to select Sweep Owner.
- Click **Next** and then paste the object reference for the **Target class** field by completing the following steps.
  - On the left pane, expand **Sales > Data Design > Classes > Document**.
  - Right-click **PriceQuote** and then click **Copy Object Reference** from the list.



- Back on the **New Disposal Policy** tab, click **Paste Object** and then verify that the **Target class** field now has **PriceQuote** as the value.
- For the **Filter expression** field, if you have saved the expression from the previous task, you can use that or paste the GUID by completing the following steps.
  - On the left pane, expand **Sales > Administrative > Storage > Storage Areas** and then click **PurchaseOrderFileStorageArea**.
  - On the **PurchaseOrderFileStorageArea** tab > **General** subtab, copy the GUID value in the **ID** field.
  - In **Notepad**, build the following expression by using the GUID value:  
**StorageArea=OBJECT('{GUID}')**

Replace GUID with the value that you copied. Verify that no typing errors are in the filter expression statement. Type the value exactly as shown. It is case-sensitive and extra spaces are not allowed. Make sure to use single quotation marks and no smart quotes or double quotation marks.

- In the **New Disposal Policy** tab, for the **Filter expression** field, paste the expression that you built.

This expression filters only the documents in this Storage Area.

- Leave the default values for the following fields:
  - Include subclasses: **Not Enabled**
  - Number of sweep iterations: **10**

The screenshot shows the 'Define Sweep Targets' page with the following settings:

- \* Target class :** PriceQuote
- Paste Object** button (highlighted in blue)
- Filter expression :** StorageArea=OBJECT('{70DC8764-0000-C31D-8F57-1728C2DFD000}')
- Include subclasses :** Not Enabled
- \* Number of sweep iterations with result records to retain :** 10

- Click **Next**, on the **Define Policy Dates** page, leave the date fields blank, and then click **Next**.

This setting allows the sweep policy to start immediately.

- In the **Summary** page, verify the details and click **Finish**.
- In the **Success** page, click **Close** to close the tab.
- In the **Disposal Policies** tab, click **Refresh** and then verify that the policy that you created (**EduDisposalPolicy**) is displayed.

## Test the disposal policy.

In this task, you will verify the properties of the policy that you created and then examine the documents and the File Storage areas.

- From the **Disposal Policies** tab, click **EduDisposalPolicy** to open it.
- On **EduDisposalPolicy** tab > **General** sub tab, scroll down and then observe the object counts.

Completed iterations : <a href="#">(i)</a>	1
Examined object count : <a href="#">(i)</a>	4
Processed object count : <a href="#">(i)</a>	4
Failed object count : <a href="#">(i)</a>	0
Current examined object count : <a href="#">(i)</a>	4
Current processed object count : <a href="#">(i)</a>	4
Current failed object count : <a href="#">(i)</a>	0

Four objects were processed.

Next verify that the Policy-controlled Sweep was created automatically.

- On the left pane, expand the **Sweep Management** node and click **Policy-Controlled Sweeps**.
- On the **Policy-Controlled Sweeps** tab, click **Refresh** and then click the **Document** link to open it.
- From the **Document** tab, select the **Subscribers** tab, verify that the policy that you created is listed, and then close the tabs.

- On the left pane, expand **Sales > Browse > Root Folder** and then click **TestBulkMove** to open the folder.
- On the **TestBulkMove** tab, click **Refresh** and then verify that the four documents that belong to the **PriceQuote** class are deleted from the folder.

Of the nine documents, only five documents are listed now. The four documents of PriceQuote class are no longer listed.
- On the left pane, expand **Sales > Administrative > Storage** and then click **Storage Areas**.
- From the **Storage Areas** tab, click **Refresh** and then verify that the **PurchaseOrderFileStorageArea** (from where you deleted the files) shows **0** (zero) for **Total Files** column.
- Log out of the administration console and close the browser.

# Activity: Create a content migration policy

In this activity, you will configure a content migration policy to move documents from one file storage area to another by doing the following steps:

- Specify a target document class to examine only the documents of that class.
- Specify a file storage area, in the filter expression, to filter the documents so that only the documents in that storage area are moved.
- Specify a storage policy (which determines the destination storage area).
- Configure a time slot to control when the sweep policy runs.
- Test the content migration policy by verifying the counters.

The steps are similar to the *Configure a bulk move content job* activity that you did earlier. But the difference is that you are using a policy sweep instead of a sweep job and configuring a time slot.

Also, instead of the Normal mode, you will use the Preview option. It operates similarly to the Normal mode, except that the content of selected objects are not moved. You will be able to preview the expected outcome. This mode is useful for testing the configuration.

Storage areas (PurchaseOrderFileStorageArea and BulkMoveStorageArea), storage policy (Bulk Move Storage Policy), and document classes of the objects (PurchaseOrder) to be moved are already configured on the student system for this activity.

In this activity, you will accomplish the following:

- Examine file storage areas.
- Create a content migration policy.
- Add time slots to the policy-controlled sweep.
- Test the content migration policy.

## Examine file storage areas.

In this task, you will examine the source and destination storage areas used for the content migration policy.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: **http://vclassbase:9080/acce**
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.

- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **Sales** object store.
- From the **Sales** tab, expand **Sales > Administrative > Storage** on the left pane and then click **Storage Areas**.
- From the **Storage Areas** tab, verify that the **PurchaseOrderFileStorageArea** contains zero files.

You will add documents to this storage area after you define the policy and monitor the counters. This is the source storage area from where the documents will be moved.

- Click the **BulkMoveStorageArea** link.

This is the destination storage area where you want to move the files.

- From the **BulkMoveStorageArea** tab, select the **Storage Policies** subtab and verify that it is associated with **Bulk Move Storage Policy**.

You will specify this storage policy in your new content migration policy in the following task.

- Close the tabs.

## Create a content migration policy.

In this task, you will create a content migration policy. For more details on the steps, refer to the previous task.

- On the left pane, collapse **Administrative**, expand the **Sweep Management > Sweep Policies**, and then click **Content Migration Policies**.
- From the **Content Migration Policies** tab, click **New**.
- On the **New Content Migration Policy** tab, complete the **Name the Policy** page with the following data:
  - Display name: **MoveNewContent**
  - Sweep mode: **Preview**

The Preview option operates similarly to the Normal mode, except that the content of the selected objects is not moved. This mode is useful for testing the configuration and you will be able to preview the expected outcome.

- **Enabled:** Select the option

Description : <a href="#">(i)</a>	MoveNewContent
* Sweep mode : <a href="#">(i)</a>	Preview
<input checked="" type="checkbox"/> Enabled <a href="#">(i)</a>	

- Complete the **Enter Sweep Criteria** page with the following data:

- Target class: **PurchaseOrder**

Copy the object reference from the PurchaseOrder class and paste it.

- Filter expression: **StorageArea=OBJECT('{GUID}')**

Where GUID = the ID for PurchaseOrderFileStorageArea

Use the filter expression that you built for PurchaseOrderFileStorageArea in the *Create a disposal policy* task.

- Storage policy names: **Bulk Move Storage Policy**
- Include subclasses: Not selected
- End replication after move: Select the option
- Update storage policy: Not selected
- Result retention: **2**

<b>Enter Sweep Criteria</b>	
Enter criteria for selecting the objects that are to be moved to another storage area.	
* Target class : <a href="#">(i)</a>	PurchaseOrder  <a href="#">Paste Object</a>
Filter expression : <a href="#">(i)</a>	<code>StorageArea=OBJECT('{70DC8764-0000-C31D-8F57-1728C2DFD000}')</code>
Storage policy names : <a href="#">(i)</a>	<b>Bulk Move Storage Policy</b>
Include subclasses :	<input type="checkbox"/> Enabled
End replication after move :	<input checked="" type="checkbox"/> Enabled
Update storage policy : <a href="#">(i)</a>	<input type="checkbox"/> Enabled
* Result retention : <a href="#">(i)</a>	2

- Complete the **Define when Sweeps Can Run** page with the following data:
  - Effective Start date: Today's date (Example: 04/11/2019) adjust the time to 3 minutes after the current time; verify AM or PM is entered correctly.
  - Effective End date: Tomorrow's date (Example: 04/12/2019)

<b>Define when Sweeps Can Run</b>	
Effective start date : 	April 11, 2019 at 8:15:00 AM Eastern Daylight Time
Effective end date : 	April 12, 2019 at 12:00:00 AM Eastern Daylight Time

- On the **Summary** page, verify the details, click **Finish**, and then click **Close** on the **Success** page.
- On the **Content Migration Policies** tab, click **Refresh** and then verify that the new policy (**MoveNewContent**) that you created is listed.

## **Add time slots to the policy-controlled sweep.**

You cannot configure time slots directly on sweep policies and must configure them on policy-controlled sweeps. In this task, you will determine the policy-controlled sweep that is associated with your sweep policy and then add a time slot to control when the policy sweep runs.

- From the **Content Migration Policies** tab, click the new policy link (**MoveNewContent**) to open it.
- On the **General** tab, find the **Policy-controlled sweep** field and then verify that the value is **Document**.
- On the left pane, expand the **Sweep Management > Policy-Controlled Sweeps**, and then click **Document** to open it.
- On the **Document** tab, scroll down, and then, under **Schedule**, click **New**.
- On the **New Time Period** page, select or enter the following values:
  - **Day of the week:** Select today's day of the week.
  - **Start time:** Select a time slot that is at least 5 minutes later than the time you specified for the Effective start.
  - **Duration:** 20 min

**New Time Period**

A time period determines when the subsystem processing begins and ends.

* Day of week :	Monday	▼
* Start time :	10:55 AM	▼
* Duration :	0 hours 20 minutes	
<input type="button" value="OK"/> <input type="button" value="Cancel"/>		

- Click **OK** to close the page, click **Save** on the **Document** tab, and then close the **Document** tab.

## Test the content migration policy.

In this task, you will verify the properties of the policy that you created, create a new document of the PurchaseOrder class, and verify the storage areas and policy.

- On the **MoveNewContent** tab, click **Refresh** and then in the **General** subtab, observe the processed counts are **0** (zero).
- On the left pane, expand **Sales > Browse > RootFolder** and then click **TestBulkMove** to open it.
- From the **TestBulkMove** tab, click **Actions > New Document**, and then complete the wizard by using the following values.
  - Document title: **PO1**
  - Class: **PurchaseOrder**
  - With content: **Selected**

* Document title : <input type="text" value="PO1"/>	PO1
* Class : <input type="text" value="PurchaseOrder"/>	PurchaseOrder
<input checked="" type="checkbox"/> With content <input type="text" value="i"/>	

- Add content element: Add the **SampleTextDoc1.txt** document from the **C:\Training\F2810G\SampleDocs** folder.
- Properties:** You can leave them blank

- Click **Next** a few times until you get to **Advanced Features** and if it is not already selected, select **PurchaseOrderFileStorageArea** for the **Storage area** field.

**Advanced Features**

Specify additional options that you can assign to the document you are adding to the object store.

Storage area : **PurchaseOrderFileStorageArea**

- On the **Summary** page, verify the details and click **Finish** and on the **Success** page, click **Close**.
- On the left pane, expand **Sales > Administrative > Storage**, and click **Storage Areas**.
- From the **Storage Areas** tab, click **Refresh** and then verify that the **PurchaseOrderFileStorageArea** contains one file.

If the Storage area tab is not already open, open it.

	Display Name	Type	Status	Total Files
	<b>PurchaseOrderFileStorageArea</b>	File Storage Area	Open	1

This is the document that you just added to this storage area.

Next, verify the counters of the content migration policy. If the **MoveNewContent** tab is not opened already, open it:

- On the left pane, expand the **Sweep Management > Sweep Policies > Content Migration Policies**, and then click **MoveNewContent**.

- From the **MoveNewContent** tab, click **Refresh**, scroll down, and then observe the various object counts.

* Result retention :	2
Completed count :	2
Examined count :	104
Processed count :	2
Failed count :	0
Current examined count :	52
Current processed count :	1
Current failed count :	0

If the counts shows 0, wait for a few minutes and then click Refresh again.

It takes a few minutes to run each iteration after the time slot start time and the process completes after 20 minutes (your configured duration time).

- Wait until the **Completed Count** field shows **2** and then observe the updated counters.

Some of your counts may vary from the following example.

- Completed count: 2**

This value shows the number of times (iterations) the sweep policy ran.

- Examined Count: 104**

This value is calculated by multiplying (Processed count) (Current examined count):  $2 * 52 = 104$

- Processed count: 2**

The total number of objects (whose content was successfully moved) that are processed in all the iterations. Even though the count is 2 due to 2 iterations, they are the same source object. You added only one document.

- **Failed count: 0**  
Total number of failures in all the iterations.
- **Current examined count: 62**  
The number of examined objects in the current iteration. The objects refer to rows in a database table that are examined.
- **Current processed count: 1** (current iteration)
- **Current failed count** - Number of failures in the most recent iteration.
- Click the **Sweep Results** tab and notice that there are 2 items.

General	Properties	Security	Sweep Results
<b>Delete</b>			
<input type="checkbox"/>	Source Object <a href="#">{70D50E6A-0000-C91E-8B44-B46B1FD4D9AD}</a>	Date Created 2019-04-12T00:14:24.114Z	Type Preview Iteration 2
<input type="checkbox"/>	<a href="#">{70D50E6A-0000-C91E-8B44-B46B1FD4D9AD}</a>	2019-04-12T00:04:23.939Z	Preview 1

Even though two items are listed, they are the same source object. The iteration column shows you which iterations each row results from.

The result records can quickly accumulate. You can limit the number of sweep records by setting the number of sweep iterations with result records to retain and deleting individual result records.

You can also delete the sweep policy to remove all the result records or create a disposal policy that targets the sweep result class.

- Log out of the administration console and close the browser window.

# Move IBM FileNet P8 Platform applications between environments

In this section, you will learn about the process of moving FileNet P8 Platform applications between environments by using FileNet Deployment Manager.

## An example of an application lifecycle

Typical projects split their infrastructure into at least three environments: Development, User Acceptance Test (UAT), and Production. An application moves in stages through the various environments during its lifecycle.

The application is designed and developed in a development environment. When the application is ready for UAT, it is migrated and deployed to a UAT environment where you do production level testing. After UAT is completed, the application is migrated and deployed to Production.

The lifecycle of an application includes two important stages:

- Initial deployment of an application from a source environment, such as a development environment, to a destination environment, such as a UAT environment.
- Propagation of incremental sets of changes from a source environment, such as a development environment, to a subset of the existing objects in a destination environment, such as a UAT environment.

## FileNet P8 Platform application elements

A FileNet P8 Platform application usually includes two types of elements: FileNet P8 Platform assets and other IBM and external assets

FileNet P8 Platform assets typically includes the following type of assets:

- Assets that you must create or configure in the destination environment, for example:
  - Data containers, such as Object stores and workflow systems
  - Connections to database and to external services such as an External data service or a web service
- Assets that are migrated and deployed, for example:
  - Metadata such as class definitions, property templates, and choice lists
  - Implementation objects such as folders, documents, custom objects, event subscriptions, workflows, and code modules

Other IBM and external assets typically includes the following assets:

- IBM Content Navigator (ICN) desktops to provide custom user interfaces
- External services like, web services and database services
- Custom code

## Migration and deployment tools

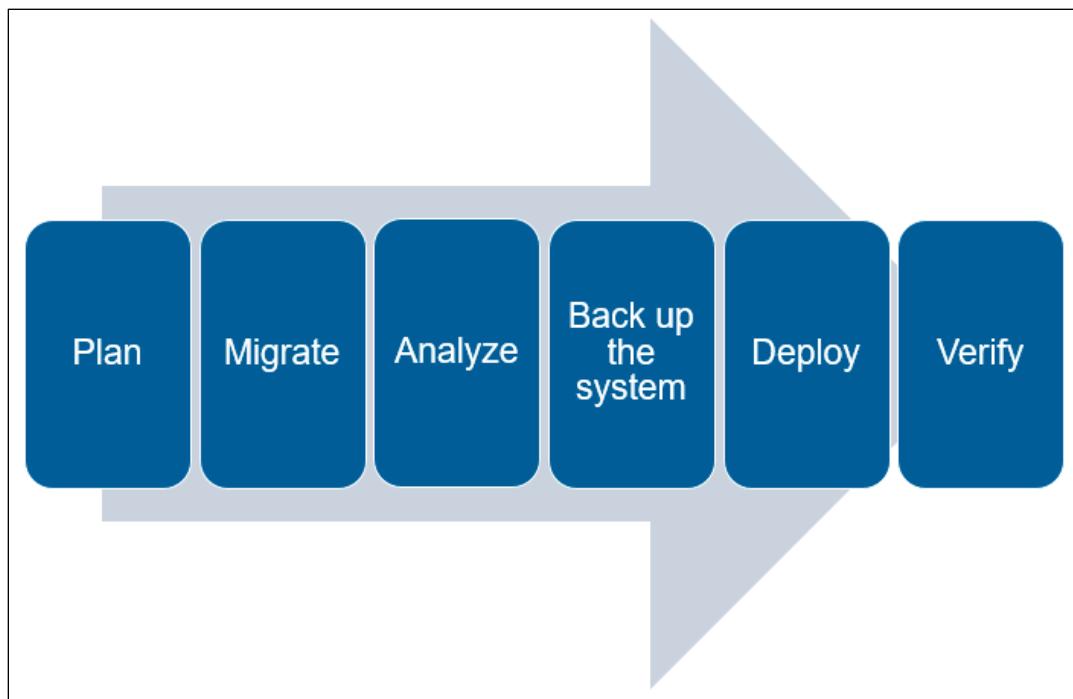
You migrate and deploy:

- the FileNet P8 assets with FileNet Deployment Manager  
Security usually differs between environments.
- the IBM Content Navigator (ICN) desktops with ICN administration tool
- other IBM and external assets with application-specific tools

## Migration and deployment phases

The migration and deployment of the FileNet P8 Platform application assets moves from Development to UAT and Production.

The migration and deployment process can typically be divided into the following major phases: planning, migration, analyzing, backing up the system, deployment, and verification.



## Plan

The first step in migrating the assets to a different environment is the planning phase. You review the following information for the source and destination environments and their compatibility: application assets, object stores and other objects, hardware and software requirements, system and asset configuration, security roles, LDAP users and groups, and dependencies.

As you complete the review, you document this information and begin creating migration and deployment instructions that are refined over time.

Documenting each process saves time, reduces errors and risks, and ensures similarity among environments. You can leverage the experiences and configurations from testing environments when an application is migrated and deployed to production.

For more information on deployment planning, refer to the IBM FileNet P8 Platform V5.5.x Knowledge Center:

[https://www.ibm.com/support/knowledgecenter/SSNW2F\\_5.5.0/com.ibm.p8.common.deploy.doc/overview\\_planning.htm#overview\\_planning](https://www.ibm.com/support/knowledgecenter/SSNW2F_5.5.0/com.ibm.p8.common.deploy.doc/overview_planning.htm#overview_planning)

## Migrate

For the migration, you use information from the planning phase to prepare an application package for deployment. To ensure that a consistent version of the application is packaged, stop all development activities (for the application that will be migrated) while the assets are exported. Ideally, the documentation that you develop during the planning phase includes information about communicating the work stoppage to the correct teams, the steps for implementing it, the time required for completing the step, any validation work that needs to be performed after each step, and the person or team responsible for performing each step.

## Analyze

During the analyzing phase, you analyze the impact of the migration and deployment on the destination environment. This analysis enables identification and mediation of issues that might cause errors. In some tools, this analysis is known as a change impact analysis report. If this report is generated, it can be archived and used for review or audit activities. The archived reports can be used iteratively to improve the migration deployment process.

## Back up the system

When you create a backup for your system, you suspend activity on the system for the destination environment. Before any modification, it is always prudent to back up the portions of the system that are affected by the changes. This practice allows a consistent snapshot of all related data to be captured.

## Deploy

For the deployment, you follow the steps outlined in the migration deployment instructions to import the application into the destination environment. The needs of your organization, the architecture of your system, and requirements of the application itself all determine the number and order of these tasks.

## Verify

During the verification phase, test the migrated application in the destination environment to verify that all of its components are working correctly. The tests that you need to complete vary according to the features and expected behaviors of the migrated application. The migration and deployment instructions should include a plan for verifying the migration, with specific tests to probe areas of change.

## Plan the migration and deployment strategy

Things to consider when planning the application migration and deployment strategy:

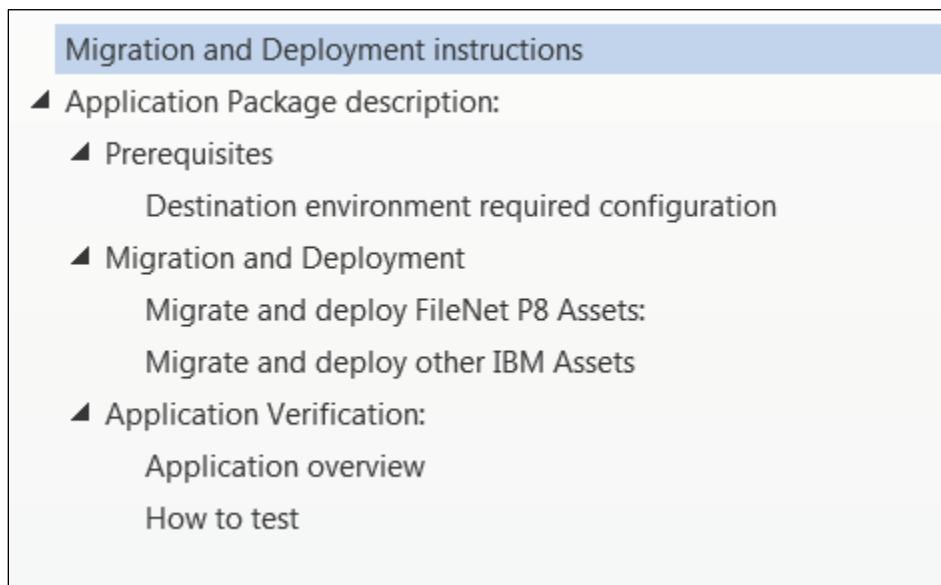
- What environments do you need to migrate and deploy the application to?
- How is change control for the application maintained?
- What application assets do you need to be modify?
- What security changes do you need on Test, QA, or Production environments?
- Who will run the export of the application assets in the development environment?  
For example, the Solution Builder or Developer
- What is the expected lifecycle of the application?
- In what environment will you make the updates before migrating and deploying to Production?

## The migration and deployment instructions

Create a document, for the migration and deployment instructions, during the development phase of your application to make the process more efficient. The migration and deployment instructions will need refining as the migration and deployment process begins.

You can also create a spreadsheet with columns showing Tasks, Performed by, Expected duration, Validation Steps, Performed on (Date), start time, end date, completed (Y/N/In progress), Notes.

The following diagram shows sample sections in a migration and deployment instructions document.



The migration and deployment instructions document typically contains the following items:

- Application Package description:  
A list of the contents in the application package, descriptions of the application components and the tool used to develop them
- Prerequisites  
System configuration steps that are needed before the use of FileNet Deployment Manager, such as the necessary object stores are created in the destination environment with all the necessary Add-ons installed
- Migration and Deployment
  - Detailed steps on how to migrate and deploy FileNet P8 assets, other IBM assets, and external assets
  - Security configuration details
  - Any post-requisite steps that are needed after the migration and deployment of the application
- Application Verification
- Describe the purpose of the application and the roles involved, include steps for testing the application in the destination environment, and to verify that the application is operational.

For more information on assembling migration and deployment instructions, refer to the IBM FileNet P8 Platform V5.5.x Knowledge Center:

[https://www.ibm.com/support/knowledgecenter/SSNW2F\\_5.5.0/com.ibm.p8.common.deploy.doc/overview\\_planning.htm#overview\\_planning](https://www.ibm.com/support/knowledgecenter/SSNW2F_5.5.0/com.ibm.p8.common.deploy.doc/overview_planning.htm#overview_planning)

## Guidelines to migration and deployment

The migration and deployment of a FileNet P8 Platform application from one environment to another requires the collaboration of various people, such as solution builders, developers, FileNet P8 administrators, and security managers.

The solution builder needs to:

- track the application assets during design and development of the application
  - Include the name, type, and description of the assets, any dependencies between assets, the location of the asset and the source security.  
Adopting this practice saves time and increases the success of the migration and deployment process.
- plan where to store the application assets, for example a file system folder that can be compressed
  - The compressed file can serve as an application package, which can be checked into your company's change control system.
- write the initial migration and deployment instructions to give to the administrator.

The solution builder and the administrator need to:

- collaborate and carefully plan security
  - Security is generally different in each environment.
- define a security mapping table to list how the security users and groups map between the different environments

The administrator needs to:

- follow the migration and deployment instructions to complete the migration
- update the migration and deployment instructions as needed for the different environments

By the time the administrator needs to migrate the application into production, the migration and deployment instructions should outline a reproducible migration process with an expected timeline.

## What is a deployment tree in FileNet Deployment Manager?

A deployment tree is a predefined folder structure that is created in the FileNet Deployment Manager (FDM) tool and the folder structure is required to work with FDM. A deployment tree contains the files that FDM creates.

Following are the characteristics of deployment trees. You can:

- create one or more deployment trees
- move or copy an entire deployment tree structure
  - You can compress the folder structure and move it to another client with an instance of FDM, to reproduce the deployment tree or an environment.
- not rename the individual folders or configuration files
- copy environments and source-destination pairs from one tree to another, provided you keep associated environments and pairs together
- delete a tree if the data is no longer needed

## Define a deployment environment

You create deployment environments in FileNet Deployment Manager to enable the tool to connect to a given Content Platform Engine environment.

You must create an environment definition for each of the environments that are needed for application migration. As part of the environment definition, you provide the configuration information that FileNet Deployment Manager needs to connect to the environment.

## Source-destination pairs

A source-destination pair connects a source environment to a destination environment and provides a mechanism for FileNet Deployment Manager to create data maps. It identifies the source and destination environments for a specific deployment, and maps the corresponding object store, service, connection point, and principal data.

How an environment is included in a source-destination pair determines its role in the deployment scenario. Therefore, an environment can be the source environment in one deployment scenario and the destination environment in another deployment scenario.

## **What is a half map in FileNet Deployment Manager?**

FileNet Deployment Manager uses a set of xml files called half maps to contain environment-specific information. Each environment has its own set of half maps for Object store, Security principle, Service, and Connection point

In FileNet Deployment Manager, when you click Retrieve Data for each of the half maps, you get two options to select what data source to use. The option to retrieve the data from a deploy data set is typically used for the source environment and the option to retrieve from Content Platform Engine is used for the destination environment.

## **Use of labels in FileNet Deployment Manager?**

Labels enable FileNet Deployment Manager (FDM) to map source half map entries to destination half map entries to create the source-destination pair data maps.

If entries in a source and a destination half map have matching labels, then FDM maps the two entries in the resulting data map.

If the entries (for example an object store half map) do not have matching labels, but the symbolic names are identical in the source and destination half maps, FDM maps those entries in the new data map.

## **Perform one-time configuration setup tasks**

The last step in planning and preparing for application deployment is to run one-time configuration and setup tasks.

A few steps must be run only one time for each source and destination environment pair.

- Create a FileNet Deployment Tree
- Create FileNet Deployment Environments

When you create the FileNet Deployment tree, you need to make a couple of decisions:

- Where to create the FileNet Deployment tree? By default the system creates the deployment tree under <CPE\_install\_path>\tools\deploy\P8DeploymentData. You can accept the default path or choose a custom path.

- To run FileNet Deployment Manager connected or disconnected mode.
 

Connected mode: Do you have internet access to both the source and destination environments?

Disconnected mode: The running FDM instance can connect only to one environment at a time.

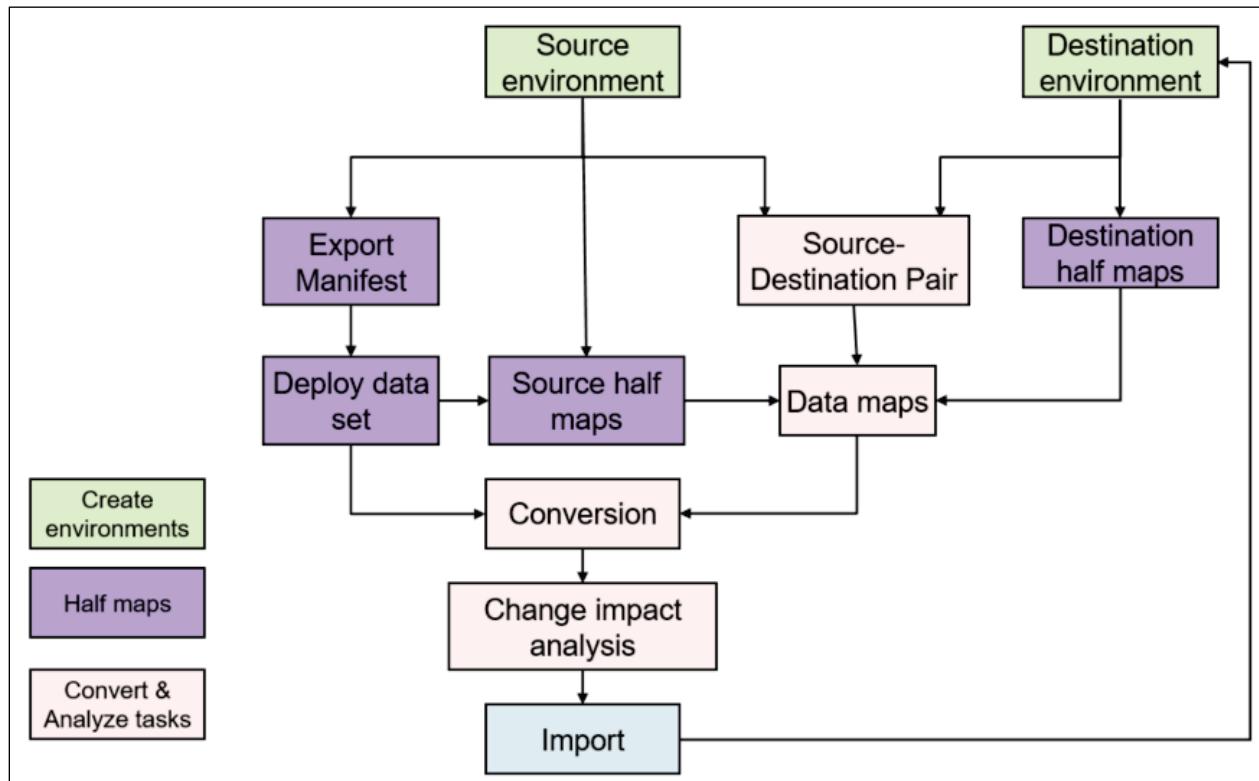
You could have two distinct instances of FDM running. One connected to the source environment and the other connected to the destination environment. The two instances must be running on different systems.
- Do you have a shared drive that can be accessed from all environments?

## Create the FileNet Deployment Environments

At a minimum, you need to create one source. If you are running in connected mode, you can create destination environments for all environments that you can connect to. For example, you can create environments for: Development, Test, and UAT environments

## Tasks for the migration and deployment of FileNet P8 assets

The following diagram shows the summary of the tasks for the migration and deployment of FileNet P8 assets in FileNet Deployment Manager.



The list of tasks includes:

- Create the source and destination environments and their respective half maps
- Create an export manifest, export the FileNet P8 assets and create a deploy data set and deploy package
- Create a source-destination pair
- Create data maps from the source and destination half maps
- Convert the FileNet P8 Assets
- Perform a change impact analysis operation
- Import the application assets into the destination environment.

# Activity: Prepare the environment

In this activity, you will create an object store and complete the configuration tasks in FileNet Deployment Manager that are required to move the object store assets from one environment to other.

In this activity, you will accomplish the following:

- Create an object store for the destination environment.
- Explore the Sales Application package.
- Verify object store Add-ons.
- Create a deployment tree.

## Create an object store for the destination environment.

In this task, you will create a new object store that is called SalesUAT which will be the destination environment. You practiced creating an object store in an earlier activity.

- Ensure that the IBM FileNet P8 Platform components are started.  
If you have not started them earlier, start the components by using the earlier activity: *Prepare your system - Start IBM FileNet P8 Platform*.
- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, click the **Object Stores** node.
- From the **Object Stores** tab on the right pane, click **New**.
- On the **New Object Store** tab, type **SalesUAT** for the **Display name** field and then click **Next**.
- Select **FNOSDS** from the list for the **Database connection** field, type **SalesUAT** for the **Schema name** field, and then click **Next**.
- On the **Select the Type of Storage Area for Content** page, leave the default value (**Database**) click **Next**.
- On the **Grant Administrative Access** page, click **Add User/Group Permission**.
- On the **Add Users and Groups** page, for the **Search for** field, select the **Groups** option (checkboxes).
- Type **Sysadmins** for the **Search by** field and then click **Search**.

- In the **Search Results** section, select **Sysadmins** from the **Available Users and Groups** pane and move it to the **Selected Users and Groups** pane by using the forward arrow.
- Scroll down and then click **OK** to close this page.
- Repeat the steps to add **p8admins**.
- Verify that the **Sysadmins** and **p8admins** groups are listed on the **Grant Administrative Access** page.

**Grant Administrative Access**

Select the users and groups who should have full administrative control of the object store. Your user can replace it or add more accounts. You must specify at least one object store administrator. [Learn more](#)

<input type="checkbox"/>		Short Name		Principal Name
<input type="checkbox"/>		p8admin		CN=p8admin,CN=Users,DC=edu,DC=ibm,DC=com
<input type="checkbox"/>		p8admins		p8admins@edu.ibm.com
<input type="checkbox"/>		Sysadmins		Sysadmins@edu.ibm.com

- Click **Next**, on the **Grant Basic Access** page, repeat the steps to add the **Clerks** group, and then click **Next**.

**Grant Basic Access**

Select the users and groups who should have basic, non-administrative access

<input type="checkbox"/>		Short Name		Principal Name
<input type="checkbox"/>		Clerks		Clerks@edu.ibm.com

- On the **Select Add-ons** page, click **Default Application Configuration** and then verify that several add-ons are selected.
- Click **Next**, review your selections on the **Summary** page, and then click **Finish** to create the object store.
- Wait for the process to complete and on the **Success** page, click **Close**.
- From the **Object Stores** tab, click **Refresh** and verify that **SalesUAT** is listed.
- Log out of administration console and close the browser.

## Explore the Sales Application package.

In an example business scenario, the Solution Builder provides you with the application package that contains all the assets that are required for the migration. In this task, you will extract the Sales Application package that will be used for the deployment into the destination environment and review the information included.

- In **Windows Explorer**, navigate to the **C:\Training\F2810G\Sales Application** folder and then explore the contents of the Sales Application package to verify the following items:

Note that the Sales Application folder contents are also available as Sales Application.zip. If needed, right-click the file, select Extract All and then click Extract.

- The **FileNet P8 assets** (and the **Export Manifests** subfolder), **Other IBM assets** folders are empty.  
You will add assets to this folder in a later task.
- The **Sales Application Assets Tracking.pdf** file lists the assets of the Sales Application.  
You will explore the file in the next task.
- The **Migration and deployment instructions.pdf** file contains the instructions.  
You will do many of the steps provided in this file in the following activities.

## Verify object store Add-ons.

The object store add-on features must be compatible between the source environment and the destination environment. In this task, you will verify that the object store add-on features that are installed in the source object store are also installed on the destination environment.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder, right-click the **Sales** object store, and then select **Install Add-on Features**.  
Sales is the source object store.

- From the **Install Add-on Features** page, on the lower pane (**Installed add-on features**), verify that the following add-on features are listed and then click **Cancel**.
  - 5.2.1 Base Content Engine Extensions
  - 5.2.1 Process Engine Extensions
  - 5.2.1 Base Application Extensions
  - 5.2.1 Stored Search Extensions
  - 5.2.1 Publishing Extensions
  - 5.2.1 Workplace Base Extensions
  - 5.2.1 Workplace Template Extensions
  - 5.2.1 Workplace Access Roles Extensions
  - 5.2.1 Workplace XT Extensions
  - 5.2.1 Teamspace Extensions
  - IBM Content Navigator 2.0.3. Entry Template Extensions
- On the left pane, expand the **Object Stores** folder, right-click the **SalesUAT** object store, and then select **Install Add-on Features**.

SalesUAT is the destination object store.
- From the **Install Add-on Features** page, on the lower pane (**Installed add-on features**), verify that the following two add-on features that are installed in the Sales object store, are not installed in the SalesUAT object store.
  - 5.2.1 Teamspace Extensions
  - IBM Content Navigator 2.0.3. Entry Template Extensions

Since the Sales application assets do not include any team spaces or entry templates, you can leave these 2 add-on features uninstalled. However, for this activity, you install the add-on features to practice this step.

- From the upper pane (**Select the add-on features to install**), select **5.2.1 Teamspace Extensions** and **IBM Content Navigator 2.0.3. Entry Template Extensions** and then click **OK**.

Wait for the install to complete.



- Click **OK** on the success window.  
You can have more add-on features in the destination object store than the source object store.
- Log out of the administration console and close the browser.

## Create a deployment tree.

In this task, you will start FileNet Deployment Manager, create a deployment tree, and review the deployment tree folder structure.

- Click **Programs > IBM FileNet P8 Platform > FileNet Deployment Manager**.  
You can also use the FileNet Deployment Manager shortcut on the desktop.  
It can take a few seconds for the Select Deployment Tree Location window to display.
- On the **Select Deployment Tree Location** window, click **Browse** next to the **Deployment Tree** field.
- Select **Local Disk (C:)**, click **Make New Folder**, and type **EDU-Deploy** for the folder name.
- Click **OK**, and then click **OK** again to close the Select Deployment Tree Location window.

FileNet Deployment Manager opens. There are two nodes: Environments and Source-Destination Pairs.

- Leave **FileNet Deployment Manager** open for the next task.
- Open **Windows Explorer**, browse to **C:\ EDU-Deploy**, and check the folders that were created when you created the deployment tree.

The folders are all empty because it is a new deployment tree. You will create source and destination environments and verify the folders in a later activity.

Each time a deployment operation is run in FileNet Deployment Manager, it creates a folder with a name: Run.<timestamp> within the temp folder. The folder contains the deployment operation file, (DeploymentOperation.xml) and the deployment.log. You will check for this folder in later exercises.

You will use the DeploymentOperation.xml file in the command-line interface to run operations. The deployment.log is useful for troubleshooting.

- Minimize the Windows Explorer window.

# Activity: Create a source environment

FileNet Deployment Manager requires that you have a source and destination environment defined.

In this activity, you will accomplish the following:

- Create a source environment.
- Check the EnvironmentConfig.xml file.

## Create a source environment.

In this task, you create a source environment in FileNet Deployment Manager (FDM).

- In **FileNet Deployment Manager**, on the left navigation pane, right-click the **Environments** node and then select **New > Environment**.  
If the FileNet Deployment Manager is not open, refer to the previous activity to open it.
- On the **New Environment** page, type **Sales\_Dev** for the name and then click **Finish**.
- Maximize **Windows Explorer** and navigate to the **C:\EDU-Deploy** folder to explore the changes to the deployment tree.
- Open the **Environments > Sales\_Dev** folder.

Notice the Assets folder and the files that are created. You will work with these files in later activities.

- Open the **EnvironmentConfig.xml** file from the **C:\ EDU-deploy\Environments\Sales\_Dev** folder in **Notepad++**.

If you get a prompt that a newer version of Notepad++ is available, click Cancel.

Notice the **<Connection target = "p8" use = "yes">** tag, and note that the series of empty tags.

The environment exists, but it does not have any configuration data.

- Close the file, exit **Notepad++** and minimize **Windows Explorer**.

Next, you will configure the Content Platform Engine Connection.

- In **FileNet Deployment Manager**, right-click the **Sales\_Dev** node and then select **Open**.

The environment opens and the CPE Connection tab is selected (which is shown in the middle between the upper and lower panes) because FDM detects that the connection is not configured.

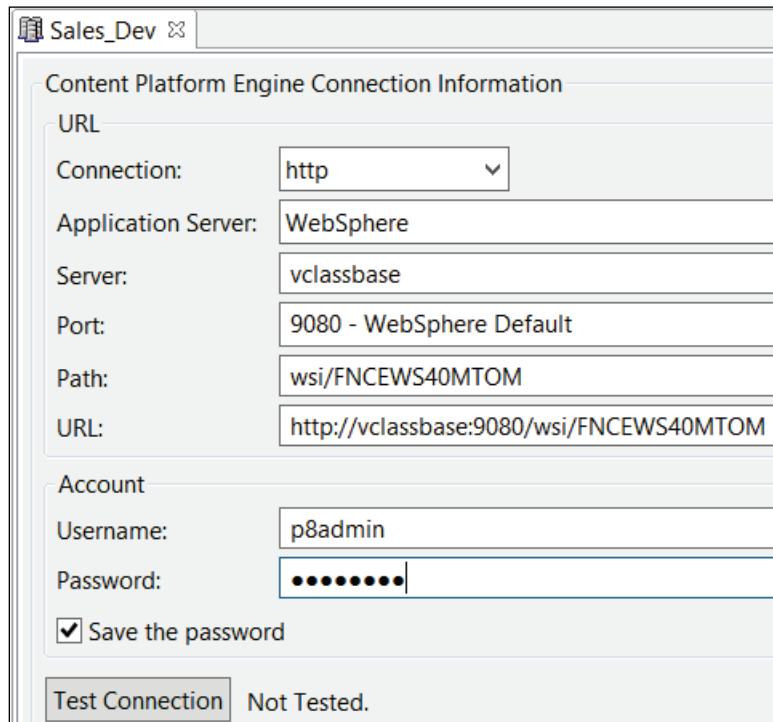
You will first complete the CPE Connection configuration.

- On the **CPE Connection** tab, select or type the following values.

- Server: **vclassbase**

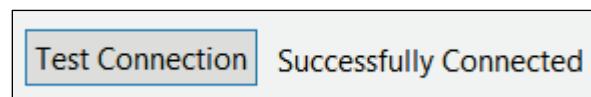
After you type the server name, the URL is populated automatically.

- Save the password: Select the option
- Username: **p8admin**
- Password: **FileNet1**



- Click **File > Save** to save your entries and then click **Test Connection**.

You receive a message with the text **Successfully Connected** to the right of Test Connection.



The Console tab at the end of the page also displays the message.

## Check the EnvironmentConfig.xml file.

In this task, you will check the EnvironmentConfig.xml file for the updates made.

- In **Windows Explorer**, navigate to the **C:\ EDU-deploy\Environments\Sales\_Dev** folder and then open the **EnvironmentConfig.xml** file again from in **Notepad++**.
- Verify that the tags, that are under the **<Connection target = "p8" use = "yes">** tag, are no longer empty.  
They contain the CPE connection information that you configured.
- Close the **EnvironmentConfig.xml** file and then close **Notepad++**.
- In **FileNet Deployment Manager**, close the **Sales\_Dev** tab and leave **FileNet Deployment Manager** open for the next task.

# Activity: Configure a destination environment

Often the destination environment would be connecting to a different FileNet P8 domain. However, to reduce the amount of resources that are required for the training image, the same FileNet P8 domain is used with different object stores.

In this activity, you will accomplish the following:

- Create a destination environment.

## Create a destination environment.

In this task, you create a destination environment in FileNet Deployment Manager.

- In **FileNet Deployment Manager**, on the left navigation pane, right-click the **Environments** node and then select **New > Environment**.
- Type **Sales\_UAT** in the name field and then click **Finish**.
- Right-click the **Sales\_UAT** node and then select **Open**.
- In the **CPE Connection** tab, select or type the following values.  
The values are same as you entered for the source environment.
  - **Server: vclassbase**
  - **Save the password:** Select the option
  - **Username: p8admin**
  - **Password: FileNet1**
- Click **File > Save** to save your entries and then click **Test Connection**.
- Verify the message with the text **Successfully Connected** to the right of Test Connection.
- In **Windows Explorer**, navigate to the **C:\ EDU-Deploy\Environments\Sales\_UAT** folder and then explore the changes to the deployment tree.

Notice the Assets folder and the files that are created.

- Open the **EnvironmentConfig.xml** file from the **C:\ EDU-deploy\Environments\Sales\_UAT** folder in **Notepad++**.
- Verify that the tags, that are under the **<Connection target = “p8” use = “yes”>** tag, contain the CPE connection information that you configured.
- Close the **EnvironmentConfig.xml** file and then close **Notepad++**.

## Retrieve object store half map for the destination environment.

In this task, you extract the object store half map for the destination environment and add a label for the half map.

- In **FileNet Deployment Manager**, if the **Sales\_UAT** tab is not already opened on the right tab, double-click the **Sales\_UAT** environment from the left pane to open it.
- From the **Sales\_UAT** tab on right pane, ensure that the **Overview** tab (on the middle of the page) is selected.  
If the CPE Connection tab is selected, switch to the Overview tab.
- Click the first **Retrieve Data** to retrieve the object store data.  
It is the top one next to the Object store Type.

Half Maps		
Action	Type	Status
Retrieve Data...	Object Store	no entries, no labels,
	Storage Policy	no entries, no labels,
	Storage Area	no entries, no labels,

Notice that the Status column shows no entries. After you extract the data, the status will be updated to show the entries.

- On the **Retrieve Data for Object Store Half Map** page, select the **From Content Platform Engine** option, and then click **Next**.
- Select the following two options:
  - **Retrieve storage policies for each object store**
  - **Retrieve storage areas for each object store**
- Leave the default value for **Mode (Merge retrieved data with existing half map)**, click **Finish**, and then click **OK** to close the success confirmation message.
- Back on the **Sales\_UAT** tab, verify that the Half Maps status is updated:

Half Maps		
Action	Type	Status
Retrieve Data...	Object Store	7 entries, no labels, updated May 20, 2019 at 12:33:12 AM
	Storage Policy	10 entries, no labels, updated May 20, 2019 at 12:33:12 AM
	Storage Area	14 entries, no labels, updated May 20, 2019 at 12:33:12 AM

The Object Store, Storage Policy, and Storage Area types are listed with their status.

- Expand the **Sales\_UAT** node in the tree view on the left pane, right-click the **Object Store Data** node, and then select **Open**.
- Verify that all the available object stores in the environment are listed on the right pane.

Label	Name	Symbolic Name	ID
	Finance	Finance	{586B1A5B-9FA9-4D58-96C5-8D454D485B7E}
	LoanProcess	LoanProcess	{FEFCA1D6-CAF2-4281-A569-9CB429F5A37D}
	LoanProcessQ...	LoanProcessQA	{955D190D-DEFA-4437-B493-1D3591C536D0}
	Marketing	Marketing	{AB7FE008-33AA-4D0A-9879-E9FCA02718D0}
	Sales	Sales	{02A4AE40-BA78-48D8-8DED-762544D5986...}
	SalesQA	SalesQA	{751DDC9D-729A-4246-8BF0-01CCA643CA83}
	SalesUAT	SalesUAT	{D7D8AF70-42DC-414D-BF3E-B2604C49E825}

Your list of object stores might be different depending on how many previous activities you have completed in this course.

- On the row that contains the **SalesUAT** value, type **SalesOS** in the **Label** column. Double-click the field to enter the value.

SalesOS	SalesUAT	SalesUAT	{D7D8AF70-42DC-414D-BF3E-B2604C49E825}
---------	----------	----------	--

This step adds a label to the destination object store half map to facilitate mapping.

- Click **File > Save** and then close the **Object Store Data for Sales\_UAT** tab.

## Retrieve security principal half map for the destination environment.

Before retrieving the users and groups for a destination environment, planning must take place to decide what users and groups are used in the destination environment. For this task, the following user and group accounts are used for the destination.

- p8admin
- Sysadmins
- Clerks

In this task, you will check a filter label file and then extract the security principal data half map for the destination environment.

- In **Windows Explorer**, browse to the **C:\Training\F2810G** folder, copy the **SalesUAT\_Users\_Map.txt** file, and paste it in the **C:\EDU-Deploy** folder.

- Open the **SalesUAT\_Users\_Map.txt** file in **Notepad++**.

A filter label file called SalesUAT\_Users\_Map.txt has already been created on the student system that is required for this task. It is a text file that is created with short names for LDAP users or groups.

```

SalesUAT_Users_Map.txt
1 p8admin
2 Sysadmins, admins
3 Clerks, users

```

Check the users and groups that are listed in the file (p8admin, Sysadmins, and Clerks) which are same as required for the Destination Environment. The corresponding labels (admins and users) have also been added separated by a comma. One entry per line.

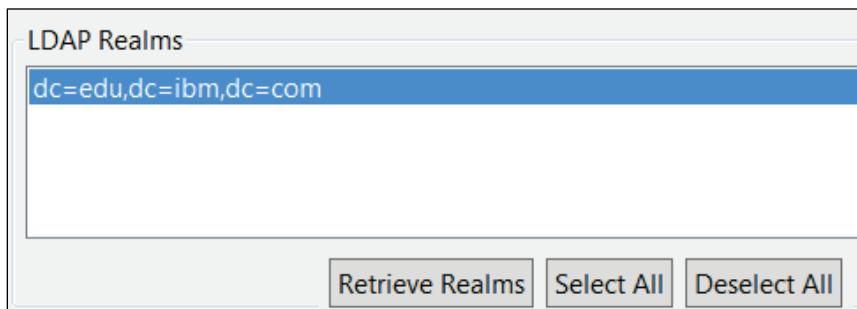
- Close the file.
- In **FileNet Deployment Manager**, on the **Sales\_UAT** tab, click the second **Retrieve Data** (for the Security Principle Type).
- Select the **From Content Platform Engine's LDAP Provider** option.

Two options are available when you retrieve the security principal data:

- Deploy Data set (default) - commonly used for the source environment
- From Content Platform Engine's LDAP Provider - commonly used for the destination environment

If you choose the Content Platform Engine's LDAP Provider option, you can specify an LDAP Realm and you can filter to specific users and groups with a label file. A label file enables you to restrict the number of users and groups that are retrieved. You need to retrieve only the users and groups that need to be mapped.

- Click **Next** and then click **Retrieve Realms**.



This step retrieves all the LDAP realms that are configured in the FileNet P8 domain. On the student system, only one realm exists for the FileNet P8 domain.

- Under the **Filter** section, select the **Use a Label File** option.
- Under the **Filter Settings** section, click the ellipsis (...) to browse to the **C:\EDU-Deploy** folder, select the **SalesUAT\_Users\_Map.txt** file and then click **Open**.
- Verify the file location is listed in the **Filter Settings** section, leave the default value for **Mode (Merge retrieved data with existing half map)** and then click **Finish**.
- Click **OK** when you are prompted with the message that successfully retrieved the principle data.
- Back on the **Sales\_UAT** tab, verify that the Half Maps status for Security Principal is updated:

<a href="#">Retrieve Data...</a>	Security Principal 3 entries, 2 labels, updated May 20, 2019 at 2:13:21 AM
----------------------------------	--

The Security Principal shows entries in the status column.

- Expand the **Sales\_UAT** node in the tree view on the left pane, double-click the **Security Principal Data** node.  
A list of security principals displays on the right pane.  
Notice that the labels are automatically set, based on the entries in the label file.
- Click **File > Save** to save the changes, and then click **File > Close All** to close all the open tabs.
- Leave FileNet Deployment Manager open for the next activity.

# Activity: Export the FileNet P8 application assets

An export manifest lists the assets that you want to export from an object store. After you create an export manifest, you can add assets to it and specify which referenced objects to include with each asset by specifying the appropriate include options. You can also refresh an export manifest to remove assets that are deleted or to update asset names. Each export manifest can contain assets from a single object store only. After you create an export manifest, you can use it to export the assets and create a deploy data set.

A deploy package is a compressed file of FileNet P8 deployable content that can be put under change control. A deploy package includes the exported data in a deploy data set and the half maps of an environment. A deploy package facilitates the use of FileNet Deployment Manager (FDM) in the disconnected mode. When you run FDM on a destination environment, that has no direct connection to the source environment, you can use a deploy package to extract the deploy data set and the source environment half maps.

In this activity, you will use FDM to create an export manifest, add the application assets, and export the data to a deploy data set. You will create the source environment half maps by using the data in the deploy data set.

In this activity, you will accomplish the following:

- Explore the Sales application assets.
- Create the export manifest.
- Add assets to the export manifest.
- Export the data.
- Extract the data half maps from the deploy data set.

## Explore the Sales application assets.

The Sales Application package includes an Application Assets Tracking spreadsheet for the Sales Application. In this task, you will use the spreadsheet to explore the Sales Application assets that you need to export.

- In **Windows Explorer**, navigate to the **C:\Training\F2810G\Sales Application** folder and then double-click the **Sales Application Assets Tracking.pdf** file to open it.

There are two types of FileNet P8 assets available: Orders, and Customers.

- Read the description and dependencies for each row and then minimize the spreadsheet.  
In the next steps, you will explore the FileNet P8 assets in the Sales object store.
- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane, expand the **Object Stores** folder and then click the **Sales** object store.
- From the **Sales** tab, on the left tab, expand **Sales > Browse > Root Folder**, and click the **Orders** folder to open it.
- From the **Orders** tab, on the **Contents** tab, a list of documents of the following classes are shown: **Order**, **ProductOrder**, and **ServiceOrder**.  
Verify the class values on the Class column.
- Close the **Orders** tab.
- On the left navigation pane, expand **Data Design > Classes > Document** and then select **Order** to open it.
- Select the **Property Definitions** tab, and verify that there are six property definitions.

<input type="checkbox"/>	Property	Data Type
<input type="checkbox"/>	order_id	String
<input type="checkbox"/>	customer_id	String
<input type="checkbox"/>	customer_name	String
<input type="checkbox"/>	payment_type	String
<input type="checkbox"/>	po_number	String
<input type="checkbox"/>	amount_due	Float

- Close the **Orders** tab.

- From the left navigation pane, expand the **Order** class and explore the two subclasses listed.



- Verify that **ProductOrder** contains one extra property definition (**product\_ids**) and **ServiceOrder** contains two extra property definitions (**hours**, **service\_date**).
- On the left navigation pane, expand the **Browse > Root Folder** node and then open the **Customers** folder.
- On the **Contents** subtab, change the default view of **Show Documents** by selecting **Show Custom Objects** from the list.

A screenshot of the 'Contents' subtab in the browser interface. The 'Actions' dropdown menu is open, showing four options: 'Show Custom Objects' (which is selected and highlighted in blue), 'Show Documents', 'Show Folders', and 'Show Custom Objects' again. The main table lists two objects: one with a customer icon and the ID A121, and another with a document icon and the ID E4C491C6-015B-11AD-9A90-62700026650, both created on April 15, 2016.

- Verify that two objects are listed and both objects belong to the **Customer** class.
- In the left navigation pane, expand **Data Design > Classes > Custom Object** and open **Customer**.
- Select the **Property Definitions** tab and verify that there are two property definitions.

Property	Data Type
customer_id	String
customer_name	String

In Summary, the Sales application contains the following FileNet P8 assets. When you are exporting, it is important to gather this information, so that when the data is exported, you can validate the number of assets.

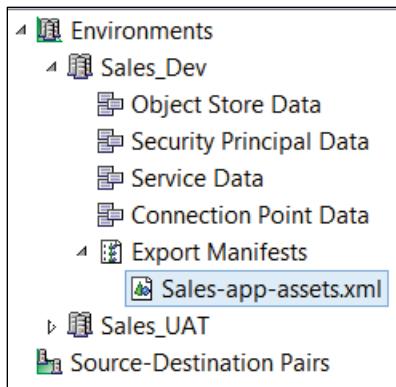
- **Orders, Folder**  
7 documents of Order class, 2 documents of ProductOrder class, and 12 documents of ServiceOrder class
- **Customers, Folder**  
2 custom objects of Customer class
- **Order, subclass of Document**  
6 property definitions
- **ProductOrder, subclass of Order**  
1 extra property definition
- **ServiceOrder, subclass of Order**  
2 extra property definitions
- **Customer, Custom Object**  
2 property definitions
- Log out of the administration console and close the browser.

## Create the export manifest.

In this task, you create an export manifest in FileNet Deployment Manager.

- If it is not already open, double-click the **FileNet Deployment Manager** icon on the desktop to open it and then click **OK** to accept the deployment tree location (**C:\EDU-Deploy**).
- Expand **Environments > Sales\_Dev**, right-click the **Export Manifests** node, and then select **New > Export Manifest**.

- Type **Sales-app-assets** for the **Name** and click **Finish**.



The export manifest is shown in the navigation pane.

## Add assets to the export manifest.

In this task, you will add all the assets that you want to export.

- From the left pane, double-click **Sales-app-assets.xml** to open the export manifest.
- Click the **green plus** icon from the toolbar to add assets to the export manifest.
- On the **Add Assets** window, from the tree view on the left pane, expand **Object Stores > Sales > Browse** and then select the **Root Folder**.
- In the right pane, select the **Customers** folder and then select **Orders** by Ctrl-clicking it.
- Click **Add** and then click **Close** to close the **Add Assets** window.
- Back on the **Sales-app-assets.xml** tab, with the two rows (**Customers** and **Orders**) selected, click the **pencil** icon from the toolbar to open the **Include Options** window.

You can simplify the export process by using the Include Options. To export only the assets you need, clear certain options, depending on the type of asset you are exporting.

- From the **Include Options** window > the **Folders and Contained Objects** section, clear the **Include parent folders** option.

**Folders and Contained Objects:**

<input checked="" type="checkbox"/> Include subfolders
<input checked="" type="checkbox"/> Include contents of folders
<input checked="" type="checkbox"/> Include relationships to containing folders
<input type="checkbox"/> Include parent folders

You do not want to include Root Folder that is the parent folder in the export. You are including, subfolders, contents of folders, and relationships to containing folders.

- From the **Document-Related** section, select the **Include annotations on documents, folders, and custom objects** option and clear others.

**Document-Related:**

<input type="checkbox"/> Include all document versions
<input type="checkbox"/> Include compound document components
<input checked="" type="checkbox"/> Include annotations on documents, folders, and custom objects
<input type="checkbox"/> Include user-defined thumbnails

For the Sales Application, only the current versions of the documents need to be exported. No compound documents exist, so it does not matter whether you select the option to include compound document components. Selecting include options that do not apply to the asset in the export manifest have no effect.

- From the **Data Design** section, select the **Include subclasses** option and ensure that all the options except the **Include modified system classes** option are selected.

**Data Design:**

<input checked="" type="checkbox"/> Include subclasses
<input checked="" type="checkbox"/> Include non-system classes
<input type="checkbox"/> Include modified system classes
<input checked="" type="checkbox"/> Include property templates on classes
<input checked="" type="checkbox"/> Include choice lists on property templates

From the Application Asset Tracking spreadsheet, you know that the Order class includes two subclasses. You can select the option to include subclasses or you can leave the option cleared and explicitly add the two subclasses to the export manifest.

- Click **OK** to close the **Include Options** window.
- Click **File > Save All** to save your entries.

## Export the assets and create a deploy data set.

In this task, you will export the assets that you added to the export manifest, and create a deploy data set.

- On the left, right-click **Sales-app-assets.xml** and then **Export**.
- On the **Export Options** window, leave the default values for the **Output Folder for the Deploy Data Sets** and the **Deploy Data Set Name**, make a note of the **Output Folder for the Deploy Data Sets**, and then click **OK**.

Default output folder: C:\EDU-Deploy\Environments\Sales\_Dev\Assets

You can change the values to whatever you want. However, it is easier if you leave the values that FileNet Deployment Manager creates.

Wait the export to complete.

- Verify that the message window shows items are processed and then click **OK** to close the success notification.
- Close the **Sales-app-assets.xml** tab.
- In **Windows Explorer**, open the **C:\EDU-deploy\Temp\Run.<timestamp>** folder for the latest run and then open the **deployment.log** with **Notepad++**.

The export details are available towards the end of the file.

```
x.LoggingStream - Exported 7 item(s) of type Order
x.LoggingStream - Exported 1 item(s) of type ReplicableClassDefinition
x.LoggingStream - Exported 2 item(s) of type Customer
x.LoggingStream - Exported 1 item(s) of type ChoiceList
x.LoggingStream - Exported 12 item(s) of type ServiceOrder
x.LoggingStream - Exported 6 item(s) of type PropertyTemplateString
x.LoggingStream - Exported 2 item(s) of type Folder
x.LoggingStream - Exported 3 item(s) of type DocumentClassDefinition
x.LoggingStream - Exported 2 item(s) of type PropertyTemplateFloat64
x.LoggingStream - Exported 1 item(s) of type ClassSubscription
x.LoggingStream - Exported 1 item(s) of type EventAction
x.LoggingStream - Exported 1 item(s) of type PropertyTemplateDateTime
x.LoggingStream - Exported 22 item(s) of type DynamicReferentialContainmentRelationship
x.LoggingStream - Exported 2 item(s) of type ReferentialContainmentRelationship
x.LoggingStream - Exported 1 item(s) of type CodeModule
x.LoggingStream - Exported 2 item(s) of type ProductOrder
x.LoggingStream - An export run has completed; status: SUCCESS, objects processed 66 failures 0
ExportDataSet - Export status:SUCCESS
ExportDataSet - Exporting 0 workflow system assets.
Export successful to: C:\EDU-Deploy\Environments\Sales_Dev\Assets\Sales-app-assets
```

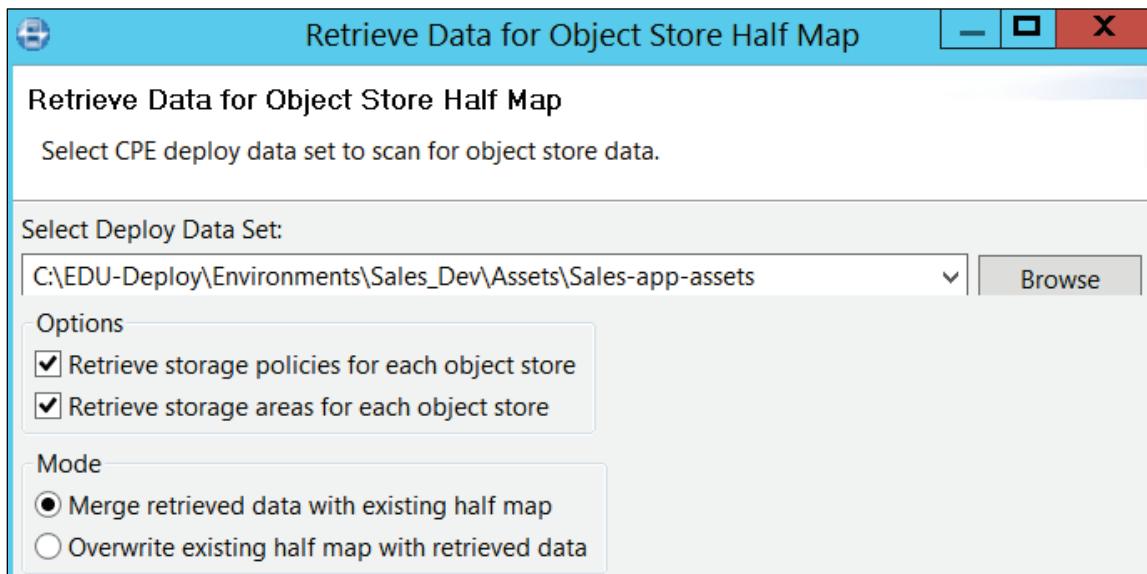
Notice how adding two items to the export manifest with appropriate include options results in many exported items.

- Close the file and exit **Notepad++**.

## Extract the data half maps from the deploy data set.

In this task, you will use the deploy data set that you created earlier to extract the data half maps for the source environment.

- In **FileNet Deployment Manager**, double-click the **Sales\_Dev** environment to open it.
- Click the first **Retrieve Data** to retrieve the object store data.  
It is the top one next to the Object store Type.  
Notice that the Status column shows no entries now. After you extract the data, the status will be updated to show the entries.
- Verify that the **Deploy Data Set File** option is selected and then click **Next**.  
If it is not already selected, select the Deploy Data Set File option. Recall you selected the other option for the destination environment.
- For the **Select Deploy Data Set** field, ensure that the correct deploy data set is selected: **C:\EDU-Deploy\Environments\Sales\_Dev\Assets\Sales-app-assets**
- Select the following two options:
  - **Retrieve storage policies for each object store**
  - **Retrieve storage areas for each object store**
- Leave the default value for **Mode (Merge retrieved data with existing half map)**.



- Click **Finish** and then click **OK** to close the success confirmation message.

- Back on the **Sales\_Dev** tab, verify that the Half Maps status is updated:

Half Maps		
Action	Type	Status
	Object Store	1 entry, no labels, updated May 20, 2019 at 4:12:31 AM
<b>Retrieve Data...</b>	Storage Policy	2 entries, no labels, updated May 20, 2019 at 4:12:31 AM
	Storage Area	2 entries, no labels, updated May 20, 2019 at 4:12:31 AM

The Object Store, Storage Policy, and Storage Area types are listed with their status.

- Expand the **Sales\_Dev** node in the tree view on the left pane, right-click the **Object Store Data** node, and then select **Open**.
- Verify that the **Sales** object store is listed on the right pane.
- To add a label to the object store half map, type **SalesOS** in the **Label** column and save your entries by clicking **File > Save**.

Recall that the same label was used for the destination environment.

- Close the **Object Store Data for Sales\_Dev** tab.

In the next step, you will retrieve Security Principal data.

- In the **Sales\_Dev** tab, click the second **Retrieve Data**.  
It is the middle one next to the Security Principle Type.
- Verify that the **Deploy Data Set File** option is selected and then click **Next**.  
If it is not already selected, select the Deploy Data Set File option.
- For the **Select Deploy Data Set** field, ensure that the correct deploy data set is selected: **C:\EDU-Deploy\Environments\Sales\_Dev\Assets\Sales-app-assets**
- Leave the default value for **Mode (Merge retrieved data with existing half map)** and then click **Finish**.
- Click **OK** to close the success confirmation window.
- Back on the **Sales\_Dev** tab, verify that the Half Maps status for Security Principal is updated:

<b>Retrieve Data...</b>	Security Principal	3 entries, no labels, updated May 20, 2019 at 4:15:29 AM
-------------------------	--------------------	--

The Security Principal shows entries in their status.

- Expand the **Sales\_Dev** node in the tree view on the left pane, double-click the **Security Principal Data** node.  
A list of security principals retrieved on the right pane.
- Add labels to the following entries by double-clicking the cell in the **Label** column and then typing the value.
  - **admins** for p8admins
  - **users** for p8users

Security Principal Data for Sales_Dev				
Label	Short Name	Display Name	Type	Name
	p8admin	p8admin	User	p8admin@edu.ibm.com
admins	p8admins	p8admins	Group	p8admins@edu.ibm.com
users	p8users	p8users	Group	p8users@edu.ibm.com

Since p8admin is the same name for both environments, no label is needed.

- Click **File > Save** to save the changes and then close the **Security Principal Data for Sales\_Dev** tab.  
In the next step, you will retrieve Service data.
- On the **Sales\_Dev** tab, click the third **Retrieve Data**, the one for the **Service**.
- Verify that the **From CPE Deploy Data Set** option is selected and then click **Next**.  
If it is not already selected, select the From CPE Deploy Data Set option.
- For the **Select Deploy Data Set** field, ensure that the correct deploy data set is selected: **C:\EDU-Deploy\Environments\Sales\_Dev\Assets\Sales-app-assets**
- Leave the default value for **Mode (Merge retrieved data with existing half map)** and then click **Finish**.
- Click **OK** to close the success confirmation window.
- Back on the **Sales\_Dev** tab, check the Half Maps status.

The status shows that there are no entries for the Service. Because, the assets in the deploy data set (Sales-app-assets) do not reference any service data, no service data entries are retrieved. It is a good idea to always extract the service data to make sure that no service data is missed.

- Click **File > Save** to save the changes, and then click **File > Close All** to close all the open tabs.
- Leave FileNet Deployment Manager open for the next activity.

## Create a deploy package

You completed the export of the Sales Application FileNet P8 assets and created a deploy data set. You used the deploy data set to extract the object store and security principal data half maps from the source environment.

You need to create a deploy package (a compressed file that contains the deployable content) for the Sales Application. You will save the deploy package and the export manifest that is used to create it in the Sales Application package folder. The Sales Application package can be put under change control and used to migrate and deploy the Sales Application to other environments.

- In **FileNet Deployment Manager**, right-click the **Sales\_Dev** environment and click **Deploy Package > Create Deploy Package**.
- In the **Create a Deploy Package** page, for the **Deploy Data Set** field, click **Browse** and select the **C:\EDU-Deploy\Environments\Sales\_Dev\Assets\Sales-app-assets** folder.
- For the **Source Environment** field, verify **Sales\_Dev** is selected.  
If it is not already selected, select **Sales\_Dev**.
- Verify that the **Deploy Package** field has the following value: **C:\EDU-Deploy\Environments\Sales\_Dev\Assets\Sales-app-assets.zip**.  
If this value is already not present, click **Change** and select the correct folder.
- Click **Finish** and then when you are prompted that the deploy package is successfully created, click **OK**.
- Close the **FileNet Deployment Manager**.
- Copy the deploy package (**Sales-app-assets.zip**) from the **C:\EDU-Deploy\Environments\Sales\_Dev\Assets** folder, and save it to the **C:\Training\F2810G\Sales Application\FileNet P8 assets** folder.
- Open the **Sales-app-assets.zip** file and verify that the compressed file contains a folder called **Content** and many XML files.  
The Content folder contains many subfolders.
- Copy the **ExportManifests** folder (and its contents) from the **C:\EDU-Deploy\Environments\Sales\_Dev\Assets** folder, and save it to the **C:\Training\F2810G\Sales Application\FileNet P8 assets** folder.
- Open the **Export Manifests** folder and verify that the **Sales-app-assets.xml** file is present.

# Activity: Export an IBM Content Navigator desktop

In this activity, you export the other IBM Assets of the Sales Application. Based on the information in the Application Assets Tracking spreadsheet, the only other asset you need to export is the Sales desktop.

On the student system, you have only one FileNet P8 domain and one instance of IBM Content Navigator. The Sales desktop does not exist yet so you can import it in a later exercise. For this activity, you export the Sample desktop, which is almost identical to the Sales desktop.

In this activity, you will accomplish the following:

- Export a desktop.

## Export a desktop.

In this task, you use the IBM Content Navigator administration tool to export the Sample desktop.

- In the **Mozilla Firefox** browser, click the **ICN Admin** bookmark or enter the following URL: **http://vclassbase:9081/navigator/?desktop=admin**  
The URL value is case-sensitive.
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the ICN administration page, from the **Desktops** tab, select the **Sample** desktop and click **Export**.
- Edit the file name to: **ICNSalesDesktopExport.properties**
- To select the repositories for the export, click the **Repositories** tab and select the **Sales** repository only.  
You can clear the top checkbox to clear all the repositories, then select Sales.
- Select the **Themes** tab and remove all the themes by clearing the top checkbox.  
The Sample desktop does not have any custom themes. The listed themes are the standard themes that are created when a desktop is created, so you do not need to export them.
- Scroll down and then click **Export** on the lower right of the page.
- When you are prompted to save the file, select the **Save File** option and click **OK**.

- In **Windows Explorer**, go to the **Downloads** (C:\Users\p8admin\Downloads) folder and copy the **ICNSalesDesktopExport.properties** file, and paste it to the **C:\Training\F2810G\Sales Application\Other IBM assets** folder.
- Log out of the IBM Content Navigator administration tool and close the browser.

# Activity: Convert and analyze the FileNet P8 assets

FileNet Deployment Manager (FDM) uses the deploy data set and the mapping that is defined in the data maps to convert the source environment objects and create a converted deploy data set. The converted deploy data set contains mapped objects that can be imported into the destination environment.

In this activity, you will use source and destination environment half maps to create data maps that facilitate the conversion of the FileNet P8 assets of the Sales Application and get them ready to import into the destination object store.

You also run a change impact analysis to discover the impact of the import on the destination environment before running the import. The change impact analysis creates a report of how the import impacts the destination object store. The report also checks for failures and warnings so that you can resolve any potential issues before running the import.

The change impact analysis operation validates the converted deploy data set with the destination environment. This operation provides information only; it does not actually import data, or modify the destination environment in any way.

In this activity, you will accomplish the following:

- Define a source-destination pair.
- Create the source-destination pair data maps.
- Convert the deploy data set.
- Run a change impact analysis.
- Analyze the change impact on the destination environment

## Define a source-destination pair.

- Double-click the **FileNet Deployment Manager** icon on the desktop to open it and then click **OK** to accept the deployment tree location (**C:\EDU-Deploy**).
- On the left navigation pane, right-click **Source-Destination Pairs** and select **New > Source-Destination Pair**.
- Type **Sales\_Dev\_to\_Sales\_UAT** for the **Name** field.

Pick a name that identifies the source and destination environments.

- Type a description, select **Sales\_Dev** for the **Source Environment** field, and then select **Sales\_UAT** for the **Destination Environment** field.

**New Source-Destination Pair**

Create a new Source-Destination Pair

Name: Sales\_Dev\_to\_Sales\_UAT

Description: Sales\_Dev to Sales\_UAT

Source-Destination Pair

Source Environment:	Sales_Dev
Destination Environment:	Sales_UAT

- Click **Finish** and verify that the new source-destination pair is listed in the navigation pane.

## Create the source-destination pair data maps.

In this task, you use the source and destination environment half maps to create source-destination pair data maps.

- On the left navigation pane, expand the **Source-Destination Pairs** node and double-click **Sales\_Dev\_to\_Sales\_UAT** to open the source-destination pair.
  - On the **Sales\_Dev\_to\_Sales\_UAT** tab, click the first **Map Data** (for the object store) and then click **OK** to close the success confirmation window.
- The object store map tab opens.
- Verify that the source name (**Sales**) is mapped to the destination name (**SalesUAT**) and then close the tab.

Object Store Map for Sales_Dev_to_Sales_UAT				
	Source Name	Destination Name	Source Symbolic Name	Destination Symbolic Name
	Sales	SalesUAT	Sales	SalesUAT

Each row in a data map contains the information of the combined source and destination half maps for that data map type.

The first column in each row contains an information icon and when you place your cursor over the icon, a snapshot of the entire contents of the row is displayed.

The second column in each row contains a green check mark icon and it indicates a successful mapping of a source and destination half map item. If the mapping was created manually (by a matched user-entered label pair in the source and destination half map items), a pencil symbol is included in the icon.

A red question mark icon for the second column indicates an unmapped source half map item.

- Close the **Object Store Map** tab.
- On the **Sales\_Dev\_to\_Sales\_UAT** tab, click the second **Map Data** (for the security principal) and then click **OK** to close the success confirmation window.

If you are prompted with a warning message: more than one source principal is mapped to the same destination principal, select the option not to perform the check next time and then click OK.

The security principal tab opens with a list of security users and groups on the source and destination environments.

	Source Short Name	Destination Short Name	Source Display Name	Destination Display Na...
	p8admins	sysadmins	p8admins	Sysadmins
	p8users	clerks	p8users	Clerks
	p8admin	p8admin	p8admin	p8admin

The second column for the p8admin row contains a gear icon in addition to a green check mark icon. If the mapping is the result of an automatic pairing of a source and a destination half map item that is based on matching column field values, a gear symbol is included in the icon.

- Click **File > Save** and then close the tab.

## Convert the deploy data set.

In this task, you use the source-destination pair data maps you created and the deploy data set that contains the exported FileNet P8 assets to convert the assets. The conversion process modifies the assets to use the destination environment object store and security principals.

- On the left navigation pane, right-click the **Sales\_Dev\_to\_Sales\_UAT** source-destination pair and select **Convert Assets**.
- Check the deploy data set (**C:\EDU-Deploy\Environments\Sales\_Dev\Assets\Sales-app-assets**) and then click **Next**.

Usually you can leave the default, unless you changed the naming conventions that FileNet Deployment Manager uses. If necessary, browse to the correct folder.

- On the **Select Output Folder For Converted Deploy Data Set**, leave the default values for the folder and the file name and then click **Finish**.
  - Folder: **C:\FDM-deploy\Environments\Sales\_UAT\Assets**
  - File: **C:\FDM-deploy\Environments\Sales-Dev\Assets\Sales-app-assets.converted**
- When you are prompted with the message: **Successfully converted the assets**, click **OK**.
 

The number of mappings can be much larger than the number of assets exported. Each asset can have multiple references. Depending on the include options, references might need to be mapped.
- Leave FileNet Deployment Manager opened for the next activity.

## Run a change impact analysis

Before you import the converted FileNet P8 assets into the destination environment, you want to examine how the destination object store is impacted. In this task, you use FileNet Deployment Manager to run a change impact analysis and create a report.

- In **FileNet Deployment Manager**, on the left pane, right-click the **Sales\_Dev\_to\_Sales\_UAT** source-destination pair and select **Analyze**.
- On the **Analyze Change Impact on Destination Environment** page, leave the default for the **Select Deploy Data Set (C:\EDU-Deploy\Environments\Sales\_UAT\Assets\Sales-app-assets.converted)** and click **Next**.

Generally you can leave the default unless any changes to the names are done.

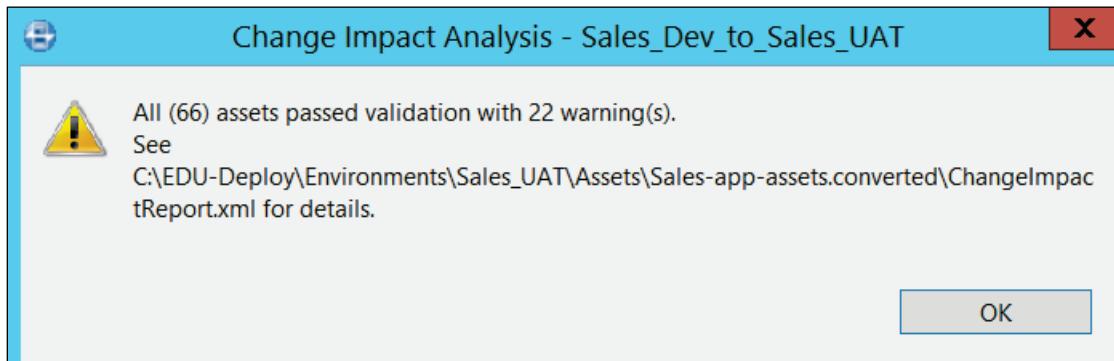
- On the **Select Import Analysis Options** page, leave the default option and then click **Next**.

No assets are imported yet, all the options result in updating all the objects. If it is not the first time that you are running the import, then choose the appropriate options.

- On the **Change Impact Report Options** page, leave the default path (**C:\EDU-Deploy\Environments\Sales\_UAT\Assets\Sales-app-assets.converted\ChangelImpactReport.xml**) and note down the path for the **Change Impact Report** file.
- Select the option to **Include details for all objects in the report**, leave the option to **view report after processing** selected, and then click **Next**.

- In the **Summary** window, review the options and then click **Finish**.

When the analysis is complete, you get a message that all assets passed validation with warnings.



- Click **OK**.

The Change Impact Analysis Report opens.

## Analyze the change impact on the destination environment

In this task, you learn how to read and interpret the change impact analysis report.

- On the **Change Impact Analysis Report** tab, click the **Summary** link on the report, review the information included in the report and note the following details:
  - Total # of Assets Analyzed
  - Total # of Failures
  - Total # of Warnings
  - Total # of Assets that would be created during Import
  - Total # of Assets that would be Skipped during Import
- Click the **Back to Top** link, click the **Assets that Passed Analysis with Warnings** link, and then explore the first warning:

The first three columns provide the display name, class type, and ID of the object to be created (Import Operation column).

The Comments column provides the details of the warning: If you attempt to import the Order Basic 200 object, and use the storage policy or storage area from the exported object, the import fails. The cause is a related object of StorageArea class does not exist.

- To find the missing object, copy the last object ID listed in the **Comments** column (including the curly braces).

Example: Related object: ID={20DE8764-0000-C515-95B0-C7A9CEE51A67}, Class=StorageArea

The value to be copied is highlighted. This is an example only. The ID value might be different on your system.

You will search for this object in the administration console in the following steps.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
  - Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
  - On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **Sales** object store.
  - From the **Sales** tab, on the left pane, click **Search**.
  - From the **Saved Searches** tab on the right, click **New Object Store Search**.
  - On the **New Object Store Search** tab > **Simple View** subtab, complete the search criteria by using the following data:
    - Class: StorageArea**
- For the **Criteria** section:
- Property: ID**
  - Condition: Equal To**
  - Value: The ID you copied from the report.**

Class : <a href="#">i</a>	Storage Area	
<b>Criteria</b> <a href="#">i</a>		
Property	Condition	Value
A <a href="#">ID</a>	Equal To	{20DE8764-

- Click **Run** and then verify that the search results show that the missing object is the **Sales** File Storage Area.

Search Result Count : 1				
<input type="checkbox"/>	Display Name	Allows Content To Be Cached	Allows Delete	Class Description
<input type="checkbox"/>	Sales	1	True	File Storage Area

You can ignore this warning, because, the FileNet P8 assets Sales Application use the default storage area that is defined for the destination object store.

Using the same steps above, you can investigate all warnings and failures.

- Log out of the administration console and close the browser window.
- Close the **Change impact analysis report** tab.

# Activity: Import the application assets

In this activity, you will complete the migration and deployment of the Sales Application into the destination environment. You import the application assets into the destination environment.

In this activity, you will accomplish the following:

- Import FileNet P8 assets into SalesUAT.
- Troubleshoot a failed import.
- Generate an audit report.
- Verify the imported FileNet P8 assets.

## Import FileNet P8 assets into SalesUAT.

In this task, you will import the assets. It is configured to fail so that you will be able to practice the troubleshooting skills in the next task.

- Double-click the **FileNet Deployment Manager** icon on the desktop to open it and then click **OK** to accept the deployment tree location (**C:\EDU-Deploy**).
- On the left navigation pane, expand the **Source-Destination Pairs** node and then right-click **Sales\_Dev\_to\_Sales\_UAT** and select **Import**.
- On the **Import Options** page, verify that the **Selected Environment** field has **Sales\_UAT** and the **Deploy Data Set** field has **C:\EDU-deploy\Environments\Sales\_UAT\Assets\Sales-app-assets.converted**
- For the **Selected Option Set** field, click **New**.
- On the **Select file name to use to create a new option set file** page, browse to the **C:\EDU-Deploy** folder, type **Sales-app-Import-options.xml** for the **File name** field and then click **Save**.
- On the **Configure Import Options** page, leave all the default options and then click **OK**.  
If prompted, save modifications to the options set.
- Back on the **Import Options** page, click **Finish**.  
The import fails. In the next task, you will investigate the cause of the failure.
- Click **OK** to close the Import failed message.

## Troubleshoot a failed import.

In this task, you will review the deployment.log and fix the issue that you saw in the previous task.

- In **Windows Explorer**, navigate to the **C:\EDU-Deploy\Temp** folder and open the latest **Run.<date and time stamp>** folder.
- Open the **deployment.log** with **Notepad++** and then search for the string: **run has started**.

The next entry that is flagged as **WARN** states: *The current import process is attempting to update system properties and the current user does not have security right to do this (modify certain system properties) for the SalesUAT object store.*

The import Options Set file includes the option to Use original create/update timestamps and users selected. The option requires that the user, that is running the import, has the rights to modify certain system properties.

Following are the two options to fix this:

- Grant p8admin the right to modify certain system properties.
- Remove the option to Use original create/update timestamps, from the import Options Set.

For this unit, you will repeat the import and clear the *Use original create/update timestamps* option from the Options Set file in the following steps.

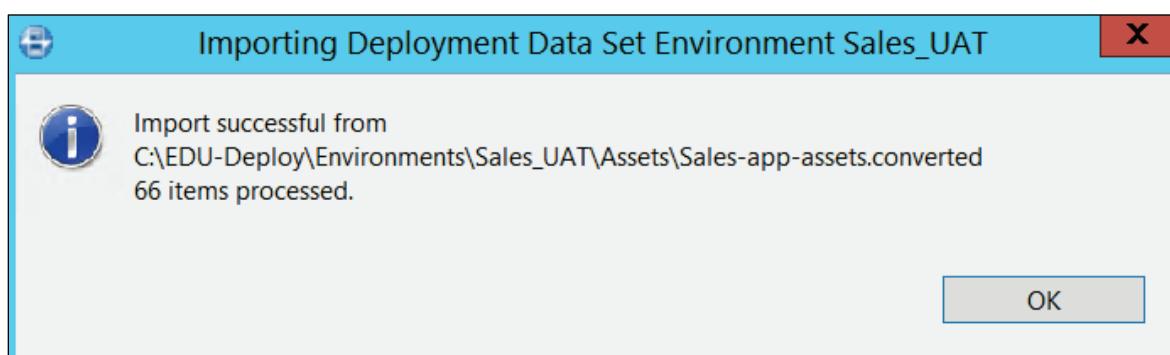
- Close the **deployment.log** file and exit **Notepad++**.
- In **FileNet Deployment Manager**, on the left pane, expand the **Source-Destination Pairs** node and then right-click **Sales\_Dev\_to\_Sales\_UAT** and select **Import**.
- On the **Import Options** page, verify that the **Selected Environment** field has **Sales\_UAT** and the **Select Deploy Data Set** field has **C:\EDU-deploy\Environments\Sales\_UAT\Assets\Sales-app-assets.converted**
- For the **Selected Option Set** field, click **Configure**.
- On the **Configure Import Options** page, under the **Standard Options** section, clear the **Use original create/update timestamps and users** option.
- In the **Import Mode** section, select the **Import with audit** option.

- Under the **File Options** section, clear the **Delete created files on error** option and then edit the text to **import-audit** for the **Audit file name** field.

<p>Standard Options</p> <p><input checked="" type="checkbox"/> Import Security Permissions</p> <p><input checked="" type="checkbox"/> Import Owner</p> <p><input checked="" type="checkbox"/> Import Object ID</p> <p><input type="checkbox"/> Use original create/update timestamps and users</p> <p><input type="checkbox"/> Import Retention</p> <p><input type="checkbox"/> Remove deleted property definitions from class definitions</p> <p><input type="checkbox"/> Transfer workflows after import</p>	<p>Import Mode</p> <p><input type="radio"/> Import only</p> <p><input checked="" type="radio"/> Import with audit</p> <p><input type="radio"/> Audit only</p> <p>File Options</p> <p><input type="checkbox"/> Delete created files on error</p> <p>Audit File Name: <b>import-audit</b></p>
--	---

- Click **OK**, when prompted to save the option set, click **OK** again, and then Click **Save** to save the changes to the same xml file (**Sales-app-Import-options.xml**).
- Back on the **Import Options** page, click **Finish**.

Wait for the import to complete.



- When you get a message that the import completes successfully, click **OK** to close the window.

## Generate an audit report.

In this task, you will create an audit report and examine it.

- In **FileNet Deployment Manager**, on the left pane, right-click **Sales\_Dev\_to\_Sales\_UAT** and select **Generate Audit Report**.
- On the **Audit Report** page, select the **Generate detailed report** option and leave the default values for all other entries.
- Click **Finish** and when you get a message that the report generated successfully, click **OK** to close the window.

The audit report opens in a browser.

- Scroll down and then examine the Audit Report by expanding some of the objects under the **Details** section.  
The report contains numerous pieces of information.
- Close the report, **FileNet Deployment Manager**, **Notepad++** and the browser windows.

## Verify the imported FileNet P8 assets.

In this task, you will verify the objects that are imported in the admin console.

- In the **Mozilla Firefox** browser, click the **ACCE** bookmark or type the following URL: <http://vclassbase:9080/acce>
- Type **p8admin** for the **User name** field, **FileNet1** for the **Password** field, and then click **Log In**.
- On the left pane of the **EDU\_P8** tab, expand the **Object Stores** folder and click the **SalesUAT** object store.
- From the **SalesUAT** tab, expand **Sales > Browse > Root Folder** on the left pane and then verify that the **Root Folder** contains the two subfolders: **Customers** and **Orders**
- Open the **Customers** folder, select **Show Custom Objects** on the right pane and verify that it contains the expected two custom objects.
- Open the **Orders** folder and verify that it contains many documents on the right pane.
- Expand **Sales > Data Design > Classes > Document** on the left pane and then verify that the **Order** class is listed and optionally check its property definitions.
- Expand **Sales > Data Design > Classes > Custom Object** on the left pane and then verify that the **Customer** class is listed and optionally check its property definitions.
- Log out of the admin console and close the browser.

# Activity: Run a change impact analysis in command line

In this section, you will learn how to run the FileNet Deployment Manager operations in the command line interface for the migration of the FileNet P8 assets of an IBM FileNet P8 Platform application.

In this activity, you will run an AnalyzeDeployDataSet operation in the command line interface. You will repeat the operation that you ran in the *Run a change impact analysis* task of the *Convert and analyze the FileNet P8 assets* activity, but you will use the command line interface instead of the GUI.

In this activity, you will accomplish the following:

- Find the deployment operation file.
- Run the operation.
- Verify the operation.
- Compare deployment operation files.

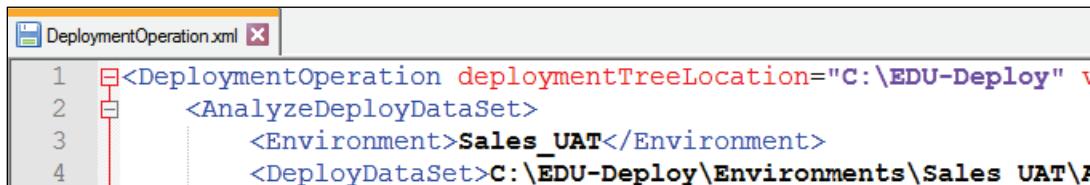
## Find the deployment operation file.

In this task, you will find the Change Impact Analysis report that you created in the *Run a change impact analysis* task of the *Convert and analyze the FileNet P8 assets* activity. You will use the date and time stamp of the report to locate the C:\EDU-Deploy\Temp\Run<date+time> folder and find the correct DeploymentOperation.xml file.

- In **Windows Explorer**, navigate to the **C:\EDU-Deploy\Environments\Sales\_UAT\Assets\Sales-app-assets.converted** folder.
- Note down the date and time stamp of the **ChangelImpactReport.xml** file.
- Find the **DeploymentOperation.xml** file from the **Run<date+time>** folder with the matching date and time stamp:
  - In another **Windows Explorer** window, navigate to the **C:\EDU-Deploy\Temp\Run<date+time>** folder, where the date and time matches the date and time of the **ChangelImpactReport.xml** file.

The hours and minutes must match, but the seconds might be slightly different.

- To verify that you have the correct DeploymentOperation.xml file, open the xml file in **Notepad++** and then ensure that the tag **<AnalyzeDeployDataSet>** is available.



```

<DeploymentOperation deploymentTreeLocation="C:\EDU-Deploy" v...
  2   <AnalyzeDeployDataSet>
  3     <Environment>Sales_UAT</Environment>
  4     <DeployDataSet>C:\EDU-Deploy\Environments\Sales_UAT\A...
  ...
  4   </AnalyzeDeployDataSet>
  3 </DeploymentOperation>
  
```

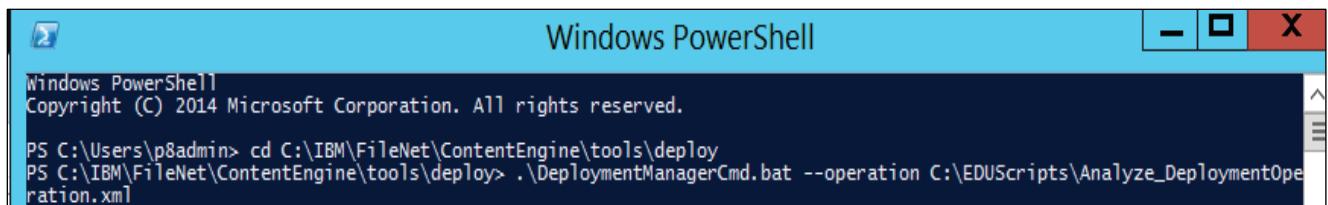
- Close the file and **Notepad++**.
- In another **Windows Explorer** window, create a folder with the name: **EDUScripts** in the **C:\** root folder.  
The name and location are not important. If you choose a path that includes spaces, you need to specify the path in quotes when you run the command.
- Copy the **DeploymentOperation.xml** file and paste it in the folder that you created (**C:\EDUScripts**).
- Rename the file to **Analyze\_DeploymentOperation.xml** and then leave **Windows Explorer** open for the next task.

## Run the operation.

In this task, you will run the analyze deployment operation with the command line.

- Click Start and open the **Windows Powershell** command prompt window.  
You can also use Command Prompt. Right-click Start, and then select Run from the list. In the Run window, type cmd and it opens the Command Prompt window.
- Change directories to the **<FDM\_Install\_Path>**:  
**C:\IBM\FileNet\ContentEngine\tools\deploy**  
You can open a Windows Explorer window and browse to the path. In the command prompt window, type cd, then copy and paste the path.
- Run the following command:  

```
. \DeploymentManagerCmd.bat --operation
C:\EDUScripts\Analyze_DeploymentOperation.xml
```



```

Windows PowerShell
Copyright (C) 2014 Microsoft Corporation. All rights reserved.

PS C:\Users\p8admin> cd C:\IBM\FileNet\ContentEngine\tools\deploy
PS C:\IBM\FileNet\ContentEngine\tools\deploy> .\DeploymentManagerCmd.bat --operation C:\EDUScripts\Analyze_DeploymentOperation.xml
  
```

The information that is normally written to the deployment.log file is displayed in the command window and also saved in the deployment.log file.

```
[ACTION.XML]
INFO [main] common.ConsoleThread - Using default logging configuration file: C:\IBM\FileNet\ContentEngine\tools\deploy\log4j.properties
INFO [main] common.ConsoleThread - Log output file: C:\IBM\FileNet\ContentEngine\tools\deploy\deployment.log
INFO [main] common.ConsoleThread - Logging system initialized
INFO [main] operations.AnalyzeDeployDataSet - Validation for import started. Scanning export data...
ERROR [Thread-7] common.ConsoleThread - 2>System Manager: MAX_SOCKETS set to: 32
ERROR [Thread-6] common.ConsoleThread - 1>System Manager: Starting PCH Listener...
ERROR [Thread-6] common.ConsoleThread - 1>System Manager: PCH Listener started.
ERROR [Thread-6] common.ConsoleThread - 1>System Manager: Registering my port [63322] with master PCH Listener on [32775]
INFO [main] base.DeploymentOpWithCPEDomain - Logging in to system: http://vclassbase:9080/wsi/FNCEWS40MTOM as p8admin
WARN [main] common.ECMDomain - System property 'java.naming.factory.initial' was not specified - defaulting to: com.ibm.websphere.naming.WsnInitialContextFactory
INFO [main] util.ConfigValueLookup - Configuration property file search order:
  user.dir = C:\IBM\FileNet\ContentEngine\tools\deploy
  user.home = C:\Users\p8admin
  java.home = C:\IBM\FileNet\ContentEngine\_cejvm\jre
INFO [main] util.ConfigValueLookup - Loading configuration resource: FileNetBuild.properties
WARN [main] util.J2EEUtil - The code has NOT detected a need to introduce specific application server logic and is defaulting to using standard J2EE calls
ERROR [Thread-6] common.ConsoleThread - 1>[Perf Log] No interval found. Auditor disabled.
INFO [main] common.ModuleLoader - -----
INFO [main] common.ModuleLoader - Deployment Modules will now be loaded and registered:
INFO [main] common.ModuleLoader - Loading Deployment Module: com.filenet.deployment.modules.DynamicReferentialContainmentRelationshipModule
INFO [main] common.ModuleLoader - Loading Deployment Module: com.filenet.deployment.modules.EntryTemplateModule
INFO [main] common.ModuleLoader - Loading Deployment Module: com.filenet.deployment.modules.FolderPreferencesModule
```

- Minimize the command window.

## Verify the operation.

In this task, you will verify that the command line operation ran successfully.

- In **Windows Explorer**, navigate to the path (**C:\EDUScripts**) where you stored the **Analyze\_DeploymentOperation.xml** file.

Notice that a **deployment.log** is created in that directory.

- Open the **deployment.log** in **Notepad++**, scroll to the end of the file, and then verify the following text:

**Validation for import started**

**All (<integer value>) assets passed validation.**

```
Thread - 1>System Manager: New socket connection detected. accept
AnalyzeDeployDataSet - Validation for import started. Scanning W
AnalyzeDeployDataSet - All (66) assets passed validation.
e extracting the resource file: ChangeImpactReport.xlsx
VALIDATE_FOR_IMPORT completed successfully. 66 items processed.
```

- Close the file and then exit **Notepad++**.
- In **Windows Explorer**, navigate to the **C:\EDU-Deploy\Environments\SalesUAT\Assets\Sales-app-assets.converted** folder.

- Notice the files **ChangelImpactReport.xml** and **ChangelImpactReport.xsl** are modified.  
The date and time stamp is the time when you ran the operation in the previous (*Run the operation*) task.
- Double-click the **ChangelImpactReport.xml** file (It opens in **Internet Explorer**), review the report and then close it.

## Compare deployment operation files.

In this task, you will use FileNet Deployment Manager to create sample deployment files and then compare the sample **AnalyzeDeployDataSet.xml** with the **Analyze\_DeploymentOperation.xml** file you created in the first (*Find for the deployment operation file*) task.

- Maximize the command prompt window and run the following command to create the sample files:  
`. \DeploymentManagerCmd.bat --samples`
- In Windows Explorer, navigate to the **C:\IBM\FileNet\ContentEngine\tools\deploy\Samples** folder and examine the files created.
- Open the **DeploymentOperation\_AnalyzeDeployDataSet.xml** file in **Notepad++**.
- Compare the sample file with the **Analyze\_DeploymentOperation.xml** that you copied in the *Find the deployment operation file* task.

Note the values that are updated in the deployment operation file that you created.

- Close the file and then exit **Notepad++**.
- Leave the **Windows Explorer** windows open for the next activity.

# Run the expand a deploy package operation on command line

In this activity, you use the command line interface to run the `ExpandDeployPackage` operation to expand the deploy package to a new environment. This activity requires that you successfully completed the *Export the FileNet P8 application assets* activity.

In this activity, you will accomplish the following:

- Create the deployment operation file from a sample.
- Run the operation.

## Create the deployment operation file from a sample.

In this task, you copy the sample file for deployment operation and edit it.

- In Windows Explorer, navigate to the `C:\Program Files\IBM\FileNet\ContentEngine\tools\deploy\Samples` folder and then copy the `DeploymentOperation_ExpandDeployPackage.xml` file.
- Paste the file to the `C:\EDUScripts` folder you created in the previous task and then open the xml file to edit it in **Notepad++**.
- Use the following data to update the file:
  - `deploymentTreeLocation`: “`C:\EDU-Deploy`”
  - `createEnvironment`: “`true`”
  - `Environment`: `Sales_test`
  - `DeployDataSet`: `C:\EDU-Deploy\Environments\Sales_test\Assets\Sales-app-assets`
  - `DeployPackage`: `C:\EDU-Deploy\Environments\Sales_Dev\Assets\Sales-app-assets.zip`

```

29 <DeploymentOperation deploymentTreeLocation="C:\EDU-Deploy" version="5.2.0">
30   <ExpandDeployPackage createEnvironment="true" halfMapMode="merge">
31     <Environment>Sales_test</Environment>
32     <DeployDataSet>C:\EDU-Deploy\Environments\Sales_test\Assets\Sales-app-assets</DeployDataSet>
33     <DeployPackage>C:\EDU-Deploy\Environments\Sales_Dev\Assets\Sales-app-assets.zip</DeployPackage>
34   </ExpandDeployPackage>
35 </DeploymentOperation>
```

The `DeployDataSet` tag uses the new environment that you will create. The `DeployPackage` tag uses the source environment that you already have from the previous activities.

- Save the file.

## Run the operation.

In this task, you will run the expand a deploy package operation in a command line window.

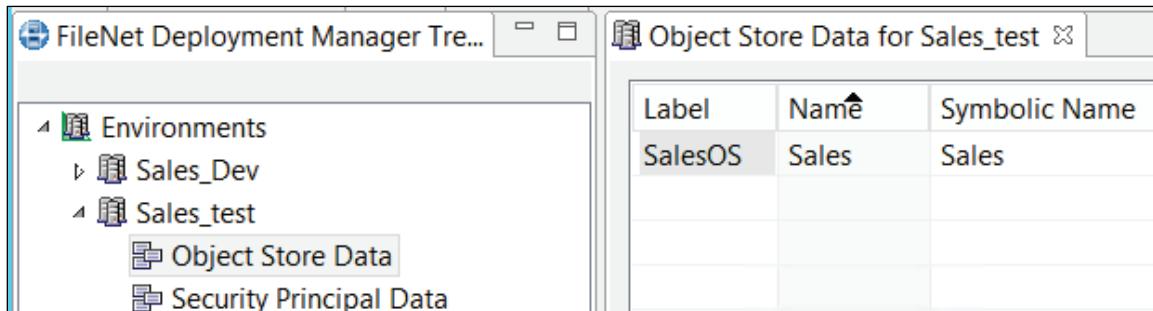
- Maximize the command prompt window and ensure that it is already on the folder path: **C:\IBM\FileNet\ContentEngine\tools\deploy**
- Type the following command and press return.  

```
.\DeploymentManagerCmd.bat --operation
C:\EDUScripts\DeploymentOperation_ExpandDeployPackage.xml
```

```
PS C:\Users\p8admin> cd C:\IBM\FileNet\ContentEngine\tools\deploy
PS C:\IBM\FileNet\ContentEngine\tools\deploy> .\DeploymentManagerCmd.bat --operation C:\EDUScripts\DeploymentOperation_E
xpandDeployPackage.xml
```

This script creates a new environment.

- To verify that the **Sales\_test** environment was created, open **FileNet Deployment Manager**.
- Expand environments and then verify that the new environment (**Sales\_test**) listed.
- Expand the **Sales\_test** environment, open the **Object Store Data** and then verify that it matches the object store data for the Sales\_Dev environment.



- Open the **Security Principal Data** and verify that it matches the security principal data for the Sales\_Dev environment.
- In **Windows Explorer**, navigate to the **C:\EDU-Deploy\Environments\Sales\_test\Assets** folder and then verify the deploy data set (**Sales-app-assets** folder) is created.
- Close all **Windows Explorer** windows and **FileNet Deployment Manager**.
- Close the command prompt window and **Notepad++**.

In this activity, you created the DeploymentOperation file from the sample files that FileNet Deployment Manager created. You can also use the FileNet Deployment Manager GUI to expand the deploy package then save the DeploymentOperation file created by FileNet Deployment Manager.

# Introduction to IBM FileNet P8 content services Containers

In this section, you will learn about the concepts of containers which provide a way to deploy a full IBM FileNet P8 Platform environment in a fraction of the time required for a standard on-premises installation.

## IBM FileNet P8 content services containers

V5.5.x introduces a new way to deploy an IBM FileNet P8 Platform environment by using Docker containers. You can deploy content services containers on an IBM Cloud Private environment or on a Kubernetes environment with a Docker server.

Containers allow you to package your application with libraries and any dependencies. They are isolated but share operating system (OS), and bins or libraries where applicable. Containers leverage host kernel and libraries to run the services. For example, Virtual Machines do not share OS (requires their own guest OS) or other resources (bins or libraries). Because of these factors, the Docker containers are lightweight. Since there is not much overhead, they startup very quickly.

Containers are:

- open source software development platform
- agnostic to container orchestration platform
- designed to persist data and configuration information outside of the container
  - This design allows the containers to be updated and upgraded without affecting the data
- packaged with enhanced monitoring components
- security hardened for cloud deployment
- portable, standardized, and faster to deploy
- architected for cloud deployment
  - They support Content Platform Engine clients by using Content Engine Web Services (CEWS) instead of EJB
- supported by cloud providers such as IBM Cloud, Amazon AWS, Microsoft Azure and Google Cloud
- supported by private cloud providers such as IBM Cloud Private, Pivotal (PKS), and RHEL OpenShift

## Benefits of containers

Deploying IBM FileNet P8 Platform components on a container platform provides the following benefits:

- Rapid deployment of components
- Improved patching and upgrading for components
- Dynamic scalability when running on the Kubernetes container platform
- Improved resiliency for your products

## Available containers for IBM FileNet P8 Platform

The following components are available as a container:

- Content Platform Engine
- Content Search Services
- IBM Content Navigator
- Content Management Interoperability Services (CMIS)

You can configure your Content Platform Engine and IBM Content Navigator container deployments to enable the sharing of content with users that are external to your organization. Configuration for this feature includes deploying an additional container to enable external sharing. Note that the external share feature is also available in a non-containerized environment.

In addition to these containers, the IBM Business Automation Configuration Container is also offered for deployments on IBM Cloud Private. When deployed, this container provides a configuration tool that offers a more streamlined configuration experience than other container deployment methods.

## Containers on IBM Cloud Private

IBM Cloud Private is an application platform for developing and managing on-premises, containerized applications. It is an integrated environment for managing containers that includes the container orchestrator Kubernetes, a private image registry, a management console, and monitoring frameworks.

## Considerations when choosing containers

Deploying FileNet P8 containers instead of an on-premises installation can be preferable in a number of possible scenarios. But there are also reasons to maintain a standard on-premises installation model.

If you have any of the following requirements, you might want to choose or maintain a standard on-premises installation:

- The platform and software choices that are currently not supported by the container platform
- Custom applications that use the Content Platform Engine EJB transport  
Containers supports Content Platform Engine clients by using Content Engine Web Services (CEWS) instead of EJB
- Applications that are integrated with IBM Content Navigator, such as IBM Enterprise Records, that are not yet available for container deployment.  
(At the time of writing this course, IBM Enterprise Records is not available for container deployment).
- A single IBM Content Navigator instance to connect to Content Manager on Demand (CMOD) and IBM Content Manager in addition to IBM FileNet P8 Platform  
Currently, only the IBM FileNet Content Manager repositories are supported in the container environment.
- Use of Content Platform Engine Virtual Member Manager directory configuration
- Use of the IBM Content Navigator Task Manager features, for example, Teamspace deletion or Box share
- Use of the Hitachi Fixed Content Device and IBM Spectrum Protect fixed content device for Content Platform Engine storage

## Administering components in a container environment

In most cases, administering container environment for content services is the same as administering on-premises environment. However, some variations exist for container environments such as the following examples:

- Product logs are in a different location
- Startup and shutdown tasks are different
- Configuration files are in a different location

## Review Questions

**Question 1:** True or False: You can deploy FileNet P8 content services containers on an IBM Cloud Private environment

**Answer 1:** True

**Question 2:** Deploying the IBM FileNet P8 Platform components on a container platform provides which of the following benefits? (Select all that apply)

- A. Rapid deployment
- B. Improved patching and upgrading
- C. Dynamic scalability
- D. Improved resiliency

**Answer 2:** A, B, C, and D

Deploying the IBM FileNet P8 Platform components on a container platform provides rapid deployment, improved patching and upgrading, dynamic scalability, and improved resiliency

**Question 3:** True or False: FileNet P8 content services containers support Content Platform Engine clients by using Enterprise JavaBeans (EJB) transport

**Answer 3:** False

FileNet P8 content services containers support Content Platform Engine clients by using Content Engine Web Services (CEWS) transport

**Question 4:** In which of the following scenarios can you use container deployment for the IBM FileNet P8 Platform components? (Select one)

- A. You have custom applications that use the Content Platform Engine EJB transport
- B. You need to use IBM Enterprise Records application that is integrated with IBM Content Navigator
- C. You use a single IBM Content Navigator instance to connect to IBM Content Manager on Demand and IBM FileNet P8 Platform
- D. You use a single IBM Content Navigator instance to connect to IBM FileNet P8 Platform

**Answer 4:** D

FileNet P8 content services containers support CEWS transport

At the time of writing this course, IBM Enterprise Records and IBM Content Manager on Demand are not supported for containers.

# Organize content across the enterprise

In this section, you will learn about how content can be organized across the enterprise and isolated in an IBM FileNet P8 Platform system for multitenancy considerations.

## Plan for Multitenancy

In a multitenancy scenario, a single instance of a software application serves multiple customers. When deciding on multitenancy for an IBM FileNet P8 Platform system, the following questions need to be addressed:

- Are customers willing to share hardware?
- What level of data isolation is required by the customers to ensure the safety and integrity of their data?  
For example, some countries require that personal data must only reside in the country of origin.  
Legal requirements can include retention management, formal records management, and data encryption for the data at rest.
- How similar are the needs of each customer for the following factors?
  - Application functionality
  - Number of users
  - The location and time zones of the users
  - Service level agreements for general system availability and for maintenance windows

## How does IBM FileNet P8 Platform fit with multitenancy needs?

Following are the main capabilities that make IBM FileNet P8 Platform work for multitenancy needs.

- Sizing the IBM FileNet P8 Platform environment
  - IBM FileNet P8 Platform is a modular architecture that can be expanded both vertically and horizontally
  - The environment can be expanded over time by adding additional hardware

- Data isolation
  - IBM FileNet P8 Platform provides flexibility for the physical location of content
  - Content can be stored on different file systems in the same physical location, as well as on different file systems in geographically diverse locations
- Security
  - Access to the IBM FileNet P8 Platform system depends on LDAP authentication
  - Access to the content in the system depends on LDAP authorization
  - Access to the system does not mean that you have access to any particular piece of content or the right to perform a certain task
  - Data that is stored can also be protected through a native data encryption capability
- System availability
  - IBM FileNet P8 Platform can support 24 x 7 availability
  - The system is configured for both high availability and disaster recovery
  - It is recommended to have known formal maintenance windows and to build processes that ensure all maintenance work can be performed in those windows

## **Isolate content in an IBM FileNet P8 Platform system**

Complete data isolation between clients can be achieved at the following levels:

- Highest level: P8 domain level
- Medium level: Object store level
- Lowest level: Within an object store

All environments, irrespective of the level of isolation, can be sized to meet the needs of an organization. There are advantages and disadvantages to all approaches. Higher level of separation reduces the need for some customizations whereas lower level of separation reduces maintenance overhead. Different models will suit different organizational needs.

## Isolate content with different P8 domains (Highest level)

Recall the Content Platform Engine resources (P8 Domain) topic under the Architecture and domain structures heading that was presented earlier in this course.

The FileNet P8 domain represents a logical grouping of physical resources and the Content Platform Engine servers that provide access to those resources. Each resource and server belong to only one domain. A server can access any resource in the domain, but cannot access any resource that lies outside of the domain.

The Java Enterprise Edition security policy domain is used to authenticate users and establish their group memberships. The identity and group membership of the user determine which FileNet P8 domain objects the user can access.

A FileNet P8 domain can act like a closed system and the following components can be isolated:

- LDAP servers
- Database servers
- Application servers
- Storage areas

You can update or change all software levels without affecting any other customers and also set up different administrators for each P8 domain.

The disadvantage to this approach is that the shared resources are very minimal or none.

## Isolate content with different Object stores (Medium level)

An object store is a repository for storing objects (such as documents, folders, and business objects) and the metadata defining an object's classes and properties. A single FileNet P8 domain can contain one or many object stores. IBM Content Navigator (which is shipped with the product) is used to access and manage the content.

This level allows sharing of resources.

In a multitenant scenario, each customer:

- is assigned one or more object stores
- can share database servers, application servers, and storage areas
- can access the object store which is controlled through an LDAP group membership
- can use different access points for each object store.

For example, you can use separate desktops within a single Content Navigator instance.

- can configure different administrators for each object store, but there is a single group that administers the Global Catalog Database (GCD) which stores the definition of the P8 domain

The disadvantage with this approach is that depending on how the environment is configured, some updates might affect all users. Customization is required to limit the display of users.

## **Isolate content within an object store (Lowest level)**

In a multitenant scenario:

- One or more customers share an object store
- Within an object store, you handle objects security through LDAP group membership
- You can set different access rights on documents, folders, and the structural elements that are used to define the documents and folders
- Each customer can either share the document storage or keep it isolated
- this level allows sharing of resources
- Each customer can have separate access at the IBM Content Navigator (ICN) level by creating their own unique desktop or ICN instance
- Software updates will take the least amount of effort that is compared to the other configurations discussed in this section.

The disadvantage with this approach is that software updates will affect all customers. Customization is required to limit the display of users.

### **Review Questions**

**Question 1:** True or False: For IBM FileNet P8 Platform, the content can be stored on different file systems in the same physical location, as well as on different file systems in geographically diverse locations.

**Answer 1:** True

**Question 2:** In a FileNet P8 domain, which of the following components can be isolated? (Select all that apply)

- A. LDAP servers
- B. Database servers
- C. Application servers
- D. Storage areas

**Answer 2:** A, B, C, and D

In a FileNet P8 domain, LDAP servers, Database servers, Application servers, Storage areas can be isolated.

**Question 3:** True or False: If you have access to the IBM FileNet P8 Platform system, you can access any content and perform actions on any objects in the object store.

**Answer 3:** False

Access to the system does not mean that you have access to any particular piece of content or the right to perform a certain task. Access to the IBM FileNet P8 Platform system depends on LDAP authentication and access to the content in the system depends on LDAP authorization.

**Question 4:** Data isolation between clients can be achieved at which of the following levels? (Select two)

- A. P8 domain
- B. Object store
- C. Storage policy
- D. Isolated region

**Answer 4:** A & B

Data isolation between clients can be achieved at P8 domain or object store levels.