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.

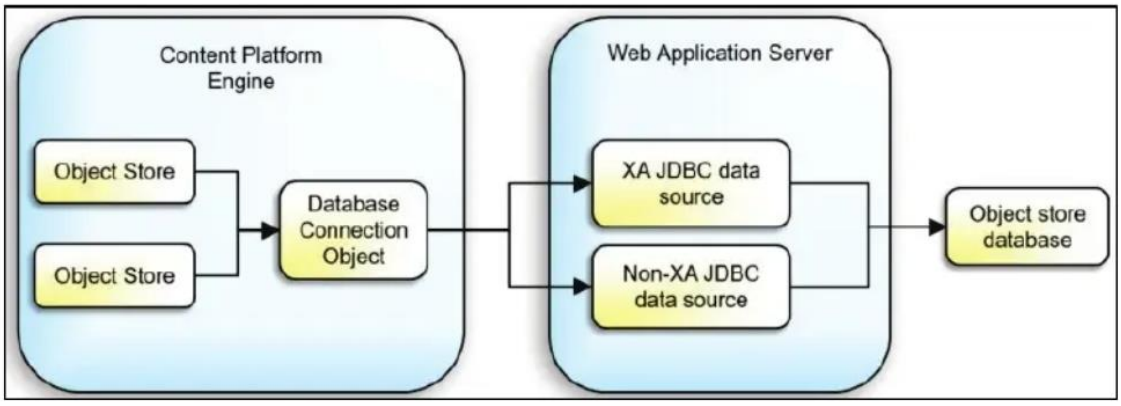
- XA is an industry-wide standard for transactions that involve multiple resources. Content Platform Engine uses the XA data sources for all create, update, and delete operations because of their rollback and timeout features.
- Non-XA transactions have no transaction coordinator. Content Platform Engine 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.

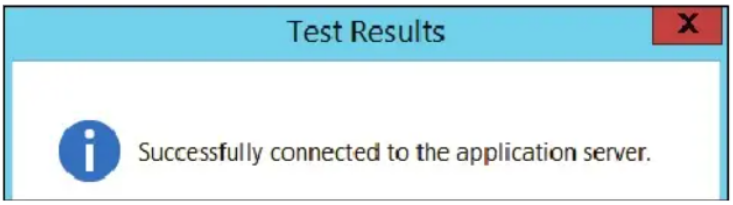
  You can also access this tool from Programs > IBM FileNet P8 Platform > FileNet Configuration Manager.

  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**

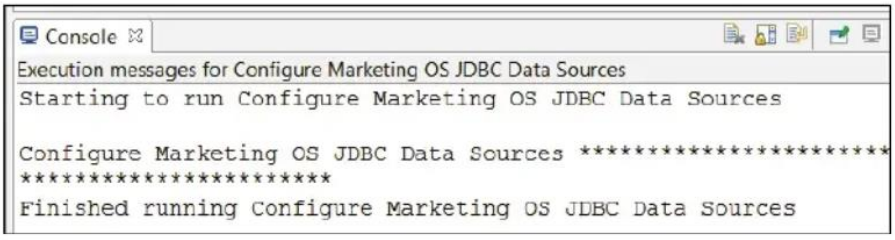
  Leave the default settings for any values that are not specified in the list.
- Click **Save**, scroll down and click **Test Database Connection**.
- If you are prompted, click **Yes** on the **Action Required** window to save the task before proceeding.

  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.



- 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.

☐	MOSDS	MOSDS	Cell=EDUCell01	DB2 IBM JCC JDBC provider for DB2	CEMP DataSource
☐	MOSDSXA	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.

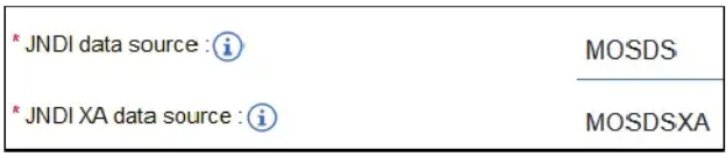
In this task, you create a Database Connection Object in the administration console.

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.



- 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 #AUTHENTICATED-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 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 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 **Repositories** 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.
- 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.