WebSphere® Adapters
Version 7 Release 0 Feature Pack 2

WebSphere Adapter for Enterprise Content Management
Version 7 Release 0 Feature Pack 2

IBM

WebSphere® Adapters
Version 7 Release 0 Feature Pack 2

WebSphere Adapter for Enterprise Content Management Version 7 Release 0 Feature Pack 2

IBM

Contents

Chapter 1. Overview of WebSphere Adapter for Enterprise Content Management

With WebSphere Adapter for Enterprise Content Management, you can create integrated processes that include the exchange of information with a Content Management Repository, without special coding. The adapter has been built using the open source specification for content repositories called Content Management Interoperability Services (CMIS).

Using the adapter, an application component (the program or piece of code that performs a specific business function) can send requests to a Content Management Repository, for example, to create a new Document in an Object Store or update an existing document in the FileNet Content Engine software or receive event notifications from the server, for example, to be notified when a new Document is created, deleted etc. Since the adapter has been built on the Content Management Interoperability Services (CMIS) specification, it creates a standard interface to the data access interface on any Content Management Repository so that the application component does not have to understand the lower-level details such as the implementation of the application or the data structures.

WebSphere Adapter for Enterprise Content Management complies with the Java 2 Platform, Enterprise Edition (J2EE) Connector Architecture (JCA) version 1.5. JCA 1.5 standardizes the way application components, application servers, and enterprise information systems which implement the CMIS specification, interact with each other. WebSphere Adapter for Enterprise Content Management makes it possible for JCA-compliant application servers to connect to and interact with a Content Management Repository. Application components running on the JCA-compliant server can then communicate with the Content Management Repository in a standard way using business objects.

The following example assumes you are setting up an adapter using WebSphere Integration Developer and deploying the module that includes the adapter to WebSphere Process Server or WebSphere Enterprise Service Bus

In this example, a company uses the FileNet Content Engine as its Content Management (CM) tool for most of its business operations. Employee data of the company is stored securely in the Content Engine. The Employee data can be modified, retrieved or created afresh. An application component might be able to use this function as part of an overall business process. For example, information about new hires in the company can be stored in the Content Engine without specific coding. User information can also be updated to reflect promotions.

With the WebSphere Adapter for Enterprise Content Management, you can automatically generate an interface to the data interface of the FileNet Content Engine to hide the lower-level details of the function. Depending on how you want to use the adapter, you can embed it with the deployed module, or install the adapter as a stand-alone component, to be used by more than one application. The adapter is deployed to WebSphere Process Server or WebSphere Enterprise Service Bus. The application component interacts with the adapter instead of with the Content Engine directly.

The adapter module, which you generate with the external service wizard of WebSphere Integration Developer, uses a standard interface and standard business

1

objects. The adapter takes the standard business object sent by the application component and invokes the appropriate function on the Content Engine. The adapter then returns a standard business object to the application component. The application component does not have to interact directly with the CMIS services; it is the Adapter for Enterprise Content Management that calls the service and returns the results.

To create data for a new employee, the application component will send a standard business object with the information of the new employee to the Adapter for Enterprise Content Management. The application component will receive, in return, the results (success or failure along with the Object Identity, ID) in a standard business object format. The application component is not required to know how the function worked or how the data was structured. The adapter will perform all the interactions with the actual Content Management Repository system.

The WebSphere Adapter for Enterprise Content Management is designed to connect to all Content Management Repositories which implement the CMIS interface. For this release, the adapter will be connecting to the FileNet Content Engine.

Key features of the new WebSphere Adapter for Enterprise Content Management

WebSphere Adapter for Enterprise Content Management is a new adapter that is based on the JCA architecture, which exchanges data (documents) with the CMIS server. The adapter provides various capabilities that help the users to experience the business flexibility, ease of usability, and powerful performance features.

This information is also available at the WebSphere Adapters product support website http://www.ibm.com/software/integration/wbiadapters/support/, which is periodically updated with the latest information.

The following features of the WebSphere Adapter for Enterprise Content Management, 7.0.2 highlights its important capabilities:

- Support for outbound operations (Create, Delete, Retrieve, RetrieveProperties, RetrieveAll, Update, and UpdateProperties) for documents in the Enterprise Content Management system.
- Support for inbound processing of events.
- Support for automatic generation of business faults.

Hardware and software requirements

The hardware and software requirements for WebSphere Adapters are provided on the IBM® Support Web site.

To view hardware and software requirements for WebSphere Adapters, see http://www.ibm.com/support/docview.wss?uid=swg27006249

Additional information

The following links provide additional information you might need to configure and deploy your adapter:

- The compatibility matrix for WebSphere Business Integration Adapters and WebSphere Adapters identifies the supported versions of required software for

your adapter. To view this document, go to the WebSphere Adapters support page and click **Compatibility Matrix** beneath the **Related** heading in the **Additional support links** section: http://www.ibm.com/software/integration/wbiadapters/support/.

- Technotes for WebSphere Adapters provide workaround and additional information that are not included in the product documentation. To view the technotes for your adapter, go to the following Web page, select the name of your adapter from the **Product category** list, and click the search icon: http://www.ibm.com/support/search.wss?tc=SSMKUK&rs=695&rank=8 &dc=DB520+D800+D900+DA900+DA800+DB560&dtm.

Technical overview of WebSphere Adapter for Enterprise Content Management

The adapter supports bidirectional exchange of business data between business applications and Content Management Repository systems, which implement the Content Management Interoperability Services (CMIS) v1.0 specification. The adapter provides outbound and inbound processing under the Java 2 Platform, Enterprise Edition (J2EE) Connector Architecture (JCA) and integrates with Service Component Architecture (SCA) components.

The adapter provides the means for services running on WebSphere Integration Developer to exchange documents with one or more Content Management Repositories. The services are contained in a module, which consists of both a project in WebSphere Integration Developer and a unit of deployment to WebSphere Process Server. The module is packaged and deployed to WebSphere Process Server as an enterprise archive (EAR) file.

What is a Content Management Repository?

A Content Management Repository is the strategies, methods and tools used to capture, manage, store, preserve, and deliver content and documents related to organizational processes. Content Management Repository tools and strategies allow the management of an organization's unstructured information, wherever that information exists.

The Content Management Repository server metadata

WebSphere Adapter for Enterprise Content Management interacts with a Content Management Repository server using the following metadata constituents:

- A **CMIS service** endpoint identifies a CMIS server.
- A **CMIS service** endpoint may provide access to more than one Content Management Repositories.
- A Content Management Repository can contain **Document Objects** and **Folder Objects**, among other objects.
- A **Document object** represents a standalone information asset. **Document objects** are the elementary entities managed by a Content Management Repository.
- A **Folder object** represents a logical container for a collection of file-able objects, which include **folder objects** and **document objects**. **Folder objects** are used to organize file-able objects.
- Every **CMIS object** has an opaque and immutable **Object Identity (ID)**, which is assigned by the repository when the object is created. An ID uniquely identifies an object within a repository regardless of the type of the object.

- Every **CMIS object** has a set of named, but not explicitly ordered, **Properties**.
- The Adapter for Enterprise Content Management is now capable of creating and deleting Documents

Outbound processing

The WebSphere Adapter for Enterprise Content Management supports outbound request processing. When the adapter receives a request, which is sent in the form of a business object from the module, it processes the request and returns the result as a business object. The adapter provides a standard set of outbound operations.

Outbound processing begins when a module receives a business object from a service, which is called a request. When a request is received, the adapter uses the information stored in the business object and metadata from the interaction specification properties to perform an operation on the Content Management Repository.

The adapter supports the following outbound operations:
- Create
- Delete
- Retrieve
- RetrieveProperties
- Update
- UpdateProperties
- RetrieveAll

The figure below shows how the adapter and module function together as part of an outbound service. A module created for outbound processing receives the request. The adapter determines the operation to be performed based on the information received in the metadata from the interaction specification properties. It then performs the operation on the Content Management Repository.
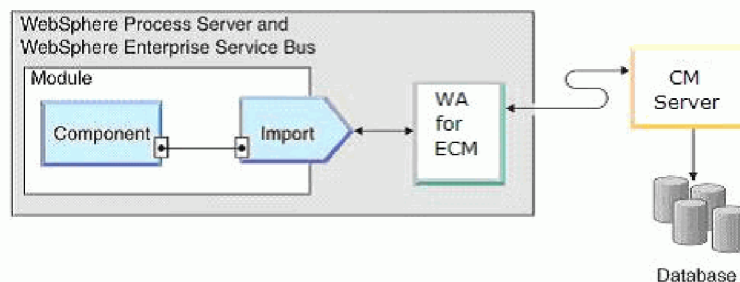
Figure 1. Adapter for Enterprise Content Management as part of an outbound SOA implementation

The adapter connects to the CMIS server with the repository URL, user name and password information. After connecting to the Content Management Repository server, the adapter lists all available **CMIS Repositories**. In each **Repository**, there can be several types of **Document types**. Instances of these Document types are stored and managed by the Content Management Repository. The adapter lists all Document types in a Repository and allows the user to select the Document types

as business object types. For each selected business object type, method binding artifacts are generated to support outbound operations.

Outbound operations

Application components use operations to perform actions such as creating instances of **Document types** on the Content Management Repository. The adapter provides certain outbound operations. The name of the operation typically indicates the type of action that the adapter takes, such as Create or Delete.

During outbound processing, the calling component (part of SCA application) calls the adapter to connect and work with business data on the Content Management Repository. All interactions between the calling component and the server are request-response type.

Create operation:

The Create operation creates a document corresponding to the selected Document type in the Content Management Repository with the specified content.

The adapter receives a request in the form of a business object to a create instance of a Document type in the CMIS Repository. The adapter processes the request and a document with a unique immutable Object Identity (ID) is created in the Content Management Repository. The content of the document is obtained from the attribute values of the requested business object.

An example of a request Business Object is modelled as below:

Figure 2. Structure of a request Business Object

Every Document Type has a set of named, but not explicitly ordered, Properties that are added in a separate Business Object. The name of this Business Object would be the Document Type in Camel-case, followed by the word Properties.

The content of the Document is handled in a separate Business Object titled FileContent.

After the document is created, the Properties Business Object is sent back to the calling component as a response to indicate that the document was created successfully.
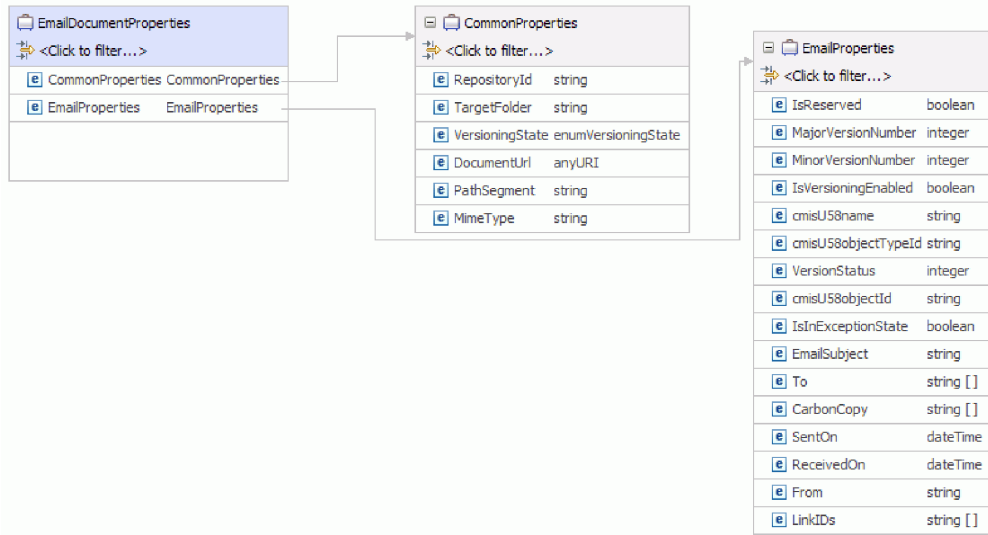
Figure 3. Structure of a response Business Object

After a successful create operation, the containment name of the document is populated in the `pathSegment` property. To perform other operations using the filename, reference the value of the `pathSegment` property in the `cmisU58name` property.

During runtime, if data is not entered for any of the fields, namely, RepositoryID, DocumentName, and TargetFolder, a MissingDataException error will be thrown. This will eventually manifest as a ResourceException which is thrown to the calling component.

Delete operation:

The Delete operation deletes a document in the Content Management Repository based on the request from the SCA component.

The adapter receives the delete request along with the unique immutable Object Identity (ID) or the unique path to the document on the Content Management Repository. The adapter processes the request and removes the document from the Content Management Repository.

Note:

- Every document in the Content Management Repository has a unique immutable Object Identity (ID). The adapter uses the value set in the ID field or the unique path to the Document on the file on the Content Management Repository, to search for the document.
- When both Object ID and document path are provided as input to the operation, the Object ID takes a precedence over the document path value to perform the operation.

For example, the structure of a request and response Document type is modelled as the below Business Object.
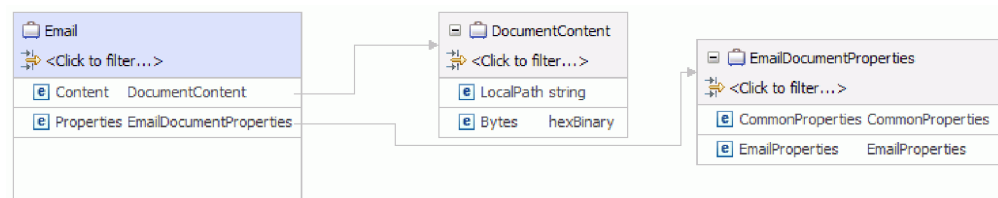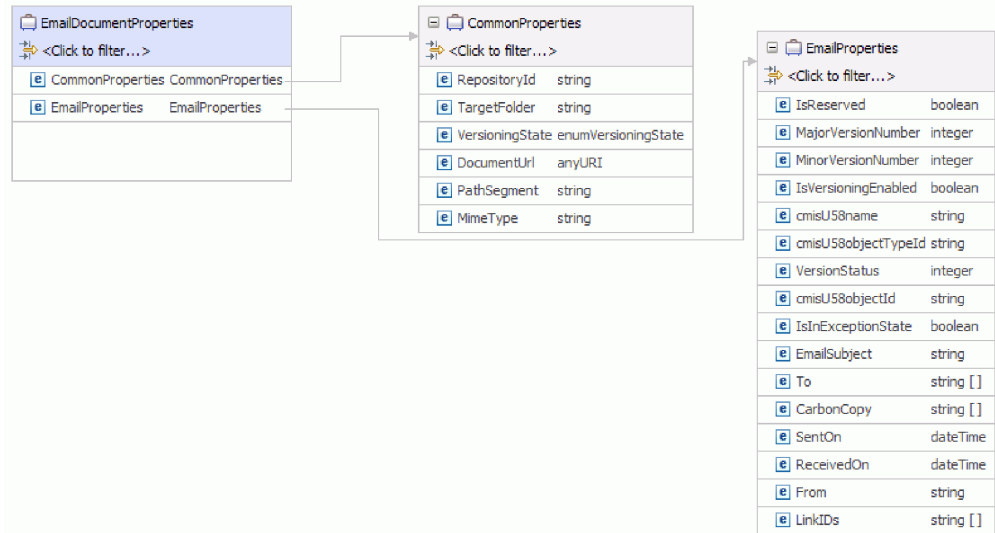
Figure 4. Structure of a delete Business Object

Every Document Type has a set of named, but not explicitly ordered, Properties that are added as a separate Business Object. The name of this Business Object would be the Document Type in Camel-case followed by the word Properties.

After the document is deleted, the Top-level Business Object is sent back to the calling component as a response to indicate that the document was deleted successfully.

During runtime, if data is not entered for the RepositoryID field, a MissingDataException will be thrown. All other cases of exception during runtime, such as a wrong Document Name or ID, will cause a ResourceException error to be returned to the calling component.

Retrieve operation:

The Retrieve operation extracts the document content based on the request from the SCA component. The Retrieve operation retrieves the content and also the properties from the document.

The adapter receives the request to retrieve a document along with the document location. The TargetFolder and cmisU58name properties must be populated with appropriate values pointing to the document path. Alternately, the cmisU58objectId property in the request can be populated with the Object ID of the document. The adapter processes the request and extracts the content of the document from the Content Management Repository.

Note: When both Object ID and document path are provided as input to the operation, the Object ID takes a precedence over the document path value to perform the operation.

The following figure shows the structure of a request EmailDocumentProperties business object.
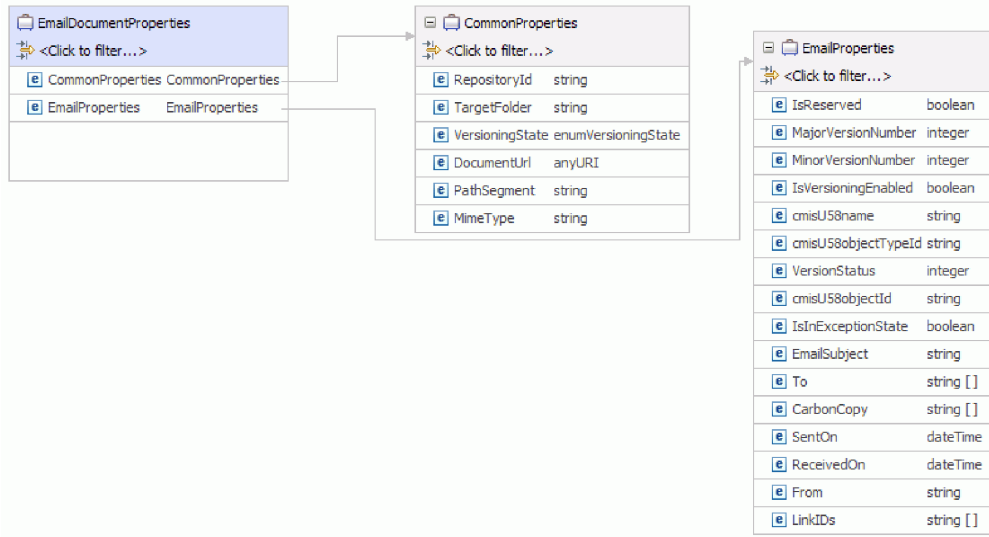
Figure 5. Structure of a request business object

After the content of the document is retrieved in the form of a byte array, it is sent back as the response to the calling component. The response has the top-level business object containing the content of the document and the document properties. The attributes in the business object include information about the retrieved document.
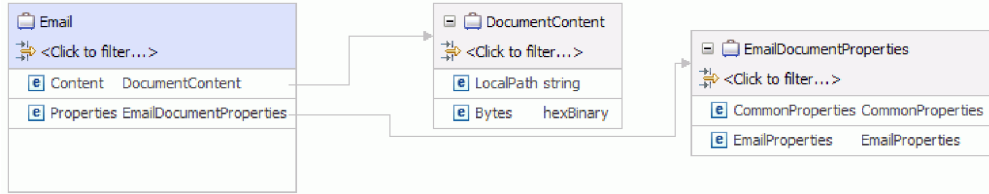
Figure 6. Structure of a response business object

When there is a processing error, the Retrieve operation might return the InvalidRequestFault or the DocumentNotFoundFault fault. For more information about these business faults, refer to Fault business objects .

RetrieveProperties operation:

The RetrieveProperties operation extracts the properties of a document content based on the request from an SCA component.

The adapter receives the retrieve request along with either the
- Object ID of the document, or
- Target folder and Document Name.

The adapter then processes the request and extracts the Properties of the document from the Content Management Repository.

Note: When both Object ID and document path are provided as input to the operation, the Object ID takes a precedence over the document path value to perform the operation.
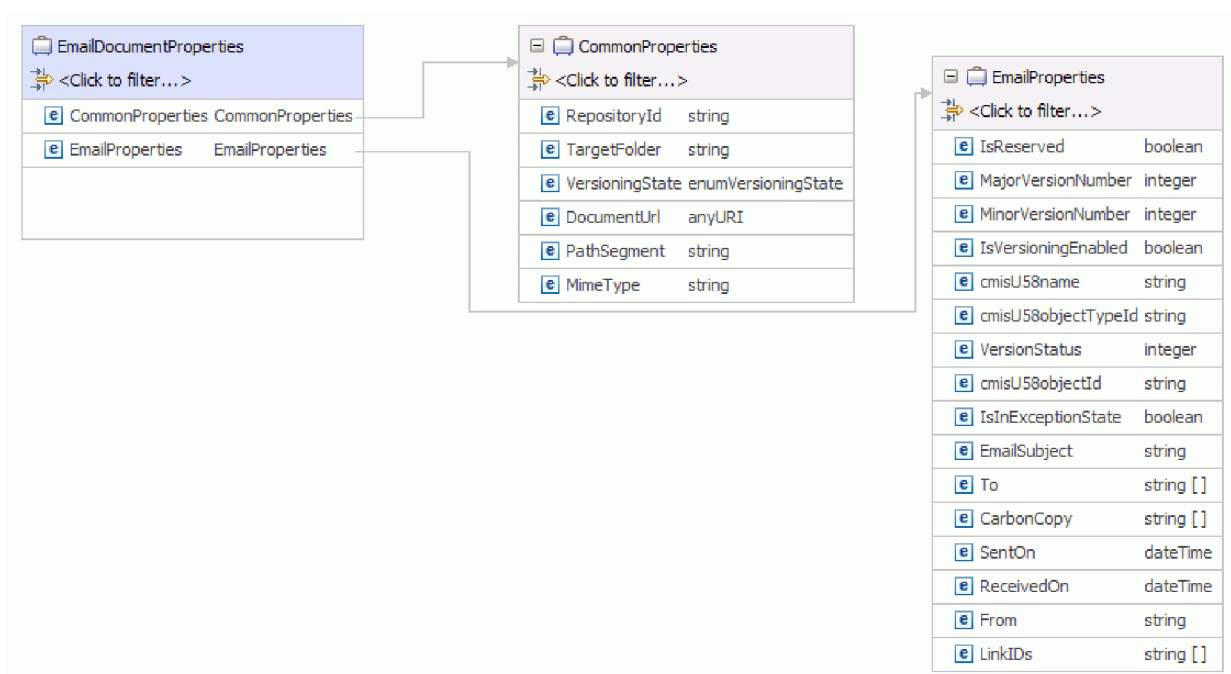
Figure 7. Example of the structure of request and response Business Object

Along with the Properties of the document, the adapter also returns a link to the **ContentStream** of the Document as a URL and populates it in the **DocumentURL** field of the return Business Object.

The ContentStream of the document, which provides access to the content in the Document object, can be accessed by the end-point using this URL.

Document URLs are of the following format:

`http://cmis.dnsdojo.com:8080/p8cmis/resources/DaphneA/ContentStream/idd_8DB4E573-4B60-46A8-8D92-C1`

The calling application uses the Rest based DocumentURL to fetch the contents of the document. The corresponding fields of the input Business Objects are populated and sent back as the response to the calling component.

When there is a processing error, the RetrieveProperties operation will return the InvalidRequestFault or the MissingDataFault faults.

Update operation:

The Update operation updates a document in the CMIS server based on the request from the SCA component.

All documents in the CMIS server have a unique **Object ID** and a **Document Path** associated with it. The adapter uses the value set in the unique Object ID to search for the document in the specified Content Management Repository. If the Object ID is not provided in the request business object, the adapter tries to use the value set in the Document Path. The adapter throws an error when both the Object ID and the Document Path are not provided in the request business object.

Note: When both Object ID and document path are provided as input to the operation, the Object ID takes a precedence over the document path value to perform the operation.

Once the adapter receives the update request from the SCA application along with the unique Object ID or the Document Path of the document, the adapter processes the request and makes the specified updates to the document.

Every **Document Type** has a set of named, but not explicitly ordered properties, which are added in a separate Business Object. The name of this Business Object would be the **Document Type** in Camel-case followed by the word **Properties**. The incoming request Business Object can contain updates for the document itself or one or more of its Properties.

For example, the structure of a request Document type is modelled as the below Business Object :

Figure 8. Structure of a request Business Object

By default, the adapter updates only those items in the document (content and Properties) that have valid data in the corresponding business object fields. During an Update operation, if the value of a Property field on the business object is explicitly set to null, the adapter updates the document by removing the item from the document.

After the document is updated, it is sent back to the calling component to indicate that the document was updated successfully.

The response sent back to the calling component contains just the Properties Business Object. The response also has attributes that include the Object ID and information about the result of the operation.

Figure 9. Structure of a response Business Object

The Update operation might throw the MissingDataFault, the InvalidRequestFault, or the DocumentNonUpdatabilityFault faults depending upon the processing error. For more information on business faults refer to Fault business objects

UpdateProperties operation:

The UpdateProperties operation updates the properties in a document in the CMIS server based on the request from the SCA component.

Any Document in the CMIS server has a unique **Object ID** and a **Document Path** associated with it. The adapter uses the value set in the unique Object ID to search for the document in the specified Content Management Repository. If the Object ID is not provided in the request business object, the adapter tries to use the value set in the Document Path. The adapter throws an error when both the Object ID and the Document Path are not provided in the request business object.

Note: When both Object ID and document path are provided as input to the operation, the Object ID takes a precedence over the document path value to perform the operation.

Once the adapter receives the update request from the SCA application along with the unique Object ID or the Document Path of the document, the adapter processes the request and makes the specified updates to the document properties.

Every **Document Type** has a set of named, but not explicitly ordered properties which are added in a separate Business Object. The name of this Business Object would be the **Document Type** in Camel-case followed by the word **Properties**. The incoming request Business Object can contain updates for the document itself or one or more of its Properties.

For example, the structure of a request and response Document type is modelled as the below Business Object :
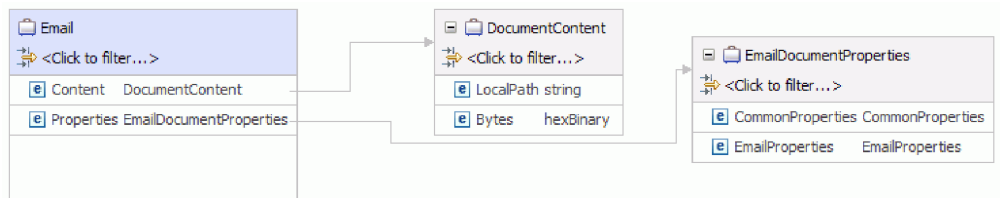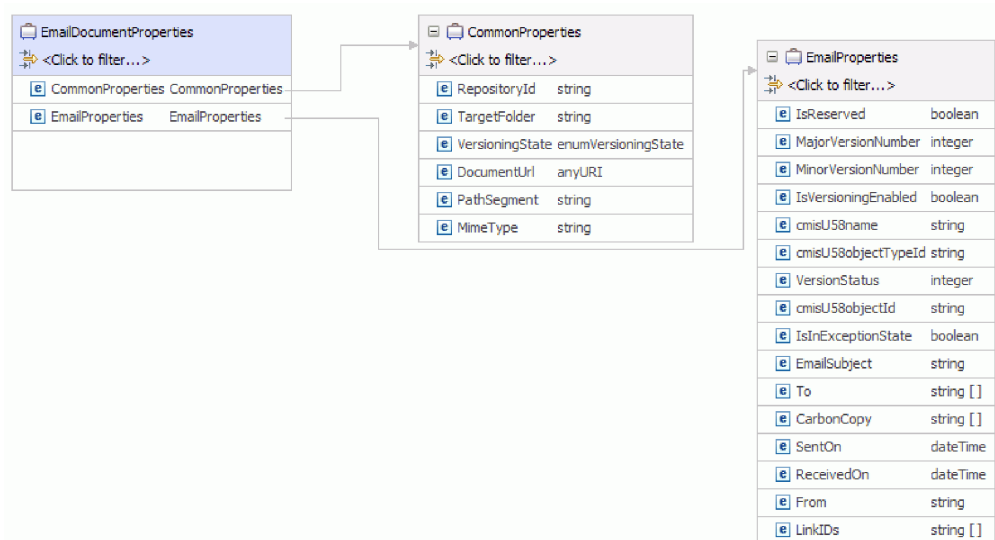

Figure 10. Structure of a request or response Business Object

By default, the adapter updates only those items in the document (content and Properties) that have valid data in the corresponding business object fields. During

an Update operation, if the value of a Property field on the business object is explicitly set to null, the adapter updates the document properties by setting the same null value.

After the document property is updated, it is sent back to the calling component to indicate that the property was updated successfully.

The response sent back to the calling component contains just the Properties Business Object. The response also has attributes that include the Object ID and information about the result of the operation.
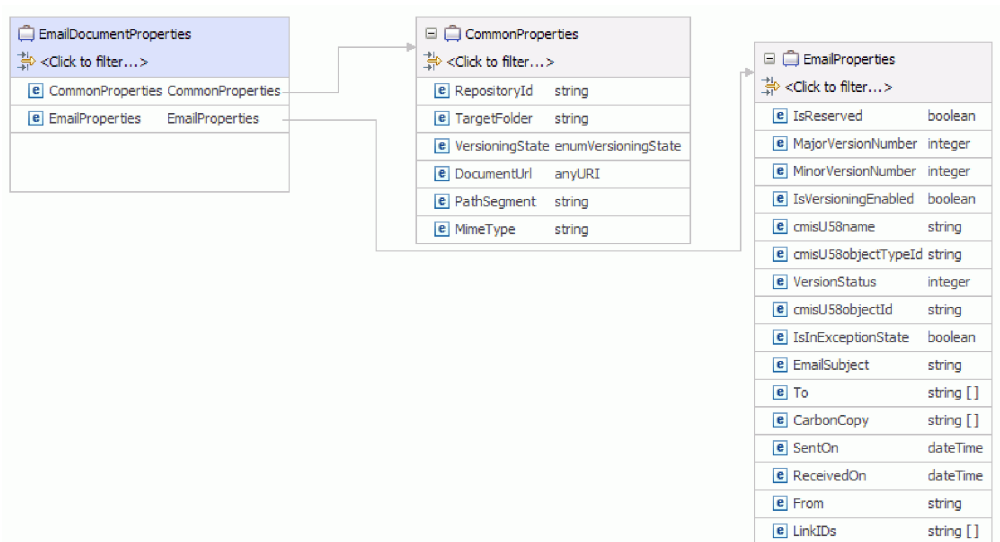
The Update operation might throw the MissingDataFault, the InvalidRequestFault, or the DocumentNonUpdatabilityFault fault depending upon the processing error. For more information on business faults, refer to Fault business objects

RetrieveAll operation:

The RetrieveAll operation extracts the properties of all documents and Document URLs to the content of the documents which match a search criteria specified in the request from the SCA component.

The adapter receives the request to retrieve document which matches a specified search criteria. The search query resembles a standard SQL statement and contains a **Select Clause** and a **Where Clause**. The **From Clause** is a Business Object level annotation of the RetrieveCriteria Business Object. The SelectClause and WhereClause can be specified in the Request Business Object but the FromClause is fixed.

For example:

```
SELECT TO, CARBONCOPY FROM EMAIL WHERE USERNAME = 'RAJANKUMAR' OR FROM='RAJKUMAR@IN.IBM.COM'

       >--------(1)--------<        >-(2)-<        >-------------------------------(3)-----------------------------------------<
```

Figure 11. Example

In this example,
- (1) indicates the SelectClause
- (2) indicates the FromClause
- (3) indicates the WhereClause

The adapter processes the request and extracts the properties of all documents along with the Document URL that references the document content matching the search query from the Content Management Repository.

The following figure shows the structure of a request business object for the Email Document Type:
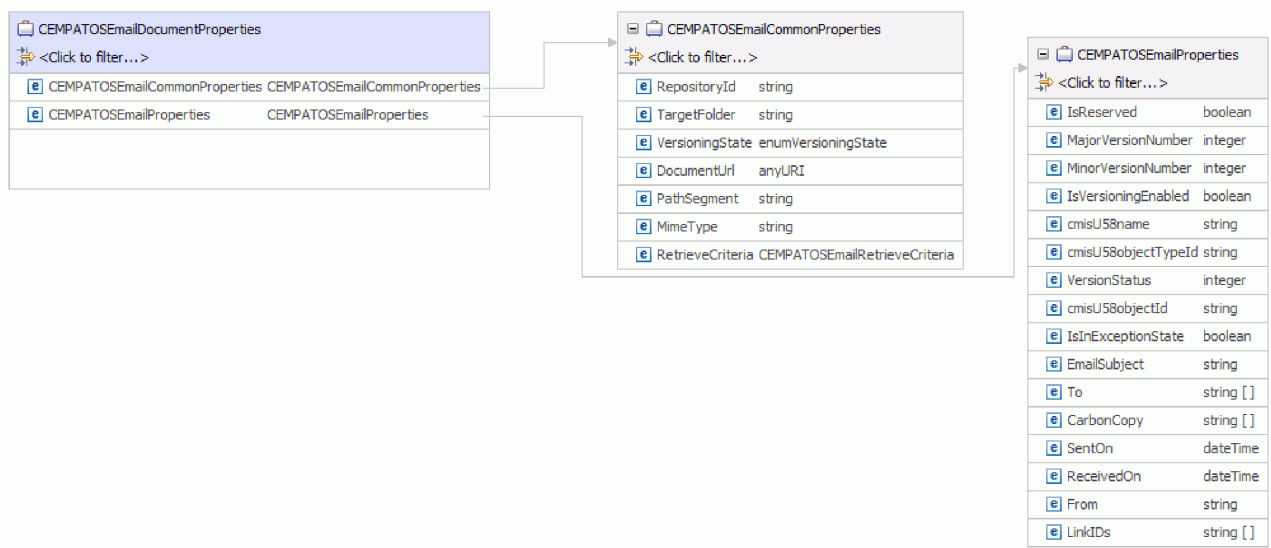
Figure 12. Example of the structure of request Business Object

You can specify the SelectClause and WhereClause in the **RetrieveCriteria** child Business Object inside the **CommonProperties** Business Object for the Document Type. The default value for SelectClause is * and the default value for the WhereClause is "".
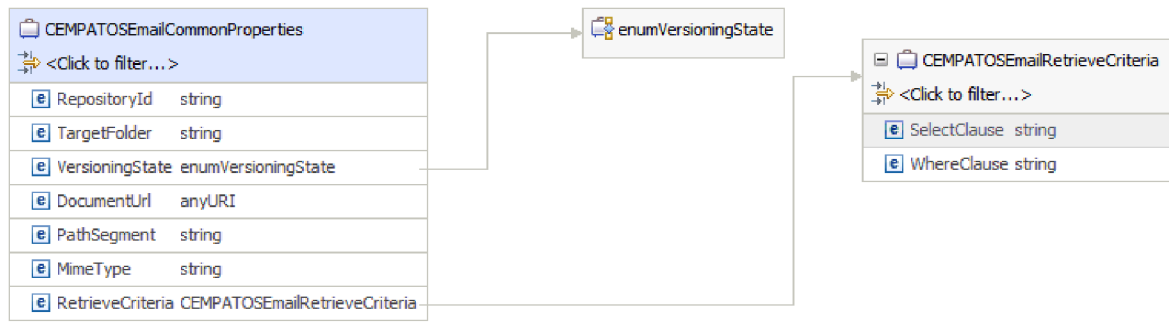
Figure 13. Example of a RetrieveCriteria

After the properties and Document URL of the documents are retrieved, it is sent back as the response to the calling component. The response has the top-level business object called Container, which contains the document properties Business Object. The attributes in the business object include information and the Document URL of the retrieved document.
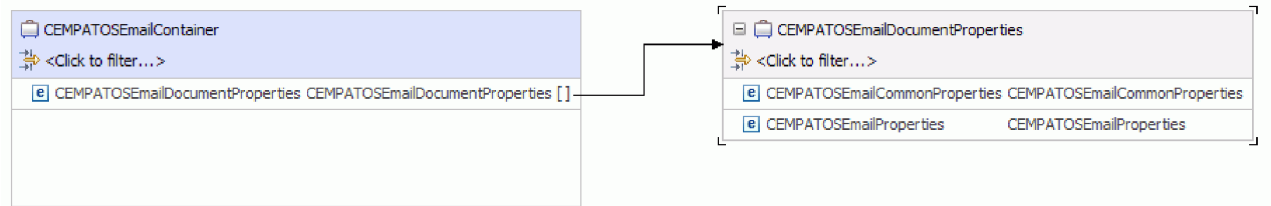
Figure 14. Structure of a response business object

When there is a processing error, the RetrieveAll operation will return the InvalidRequestFault, MissingDataFault or the MatchesExceededLimitFault faults. Refer to Fault business objects for more information on fault business objects.

Inbound processing

Adapter for Enterprise Content Management supports inbound processing of events. The adapter polls the event database in the CMIS server for events at specified intervals. Each time a subscription is created or updated, the adapter tracks the process as an event. When the adapter detects an event, it requests a copy of the subscription, converts the data into a business object, and sends it to the consuming service.

To set up the Adapter for Enterprise Content Management for Inbound processing, use the Content Engine Subscription Wizard to create subscriptions on an Enterprise Content Manager system, such as the IBM FileNet® Content Manager, for the object class you select. A subscription defines a request to execute an event action. For example, you can create a subscription that notifies you by Email when documents of a specified object class are created and saved in the object store.

You can create a subscription from an object class, an instance in the object class, or a version of the object class. If you create a subscription for an object class, the subscription automatically applies to all new objects to which you assign the class. An object can be a class definition, single instance, or a version. A class definition refers to a subscription associated with all instances of a given class. A single instance refers to a subscription associated with a specific version of an object. A version refers to a subscription associated with all versions of a versionable object, where each version is a separate instance.

When you assign subscriptions to classes, you can manage a set of common objects more efficiently. You can also limit the number of subscriptions to run at the same time, and ensure optimum system performance.

The following illustration shows the inbound processing flow for Adapter for Enterprise Content Management. The adapter polls the CMIS server for incoming events, converts them into business objects, and then the adapter sends them to a consuming service.
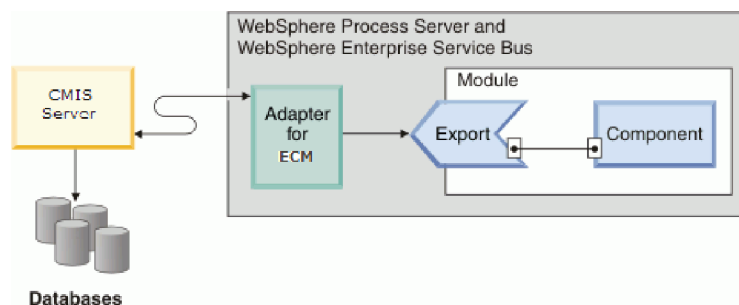
Figure 15. Inbound processing

When you create, update, or delete a document, the adapter inserts an event record into the event table to record that event. When the adapter is polling events, it reads the information from this event record and retrieves the relative document. The adapter then returns the document as a business object. For an event type of either create or update, the adapter returns the document as a business object on

the adapter workstation. For a delete event, the returned business object contains only the Object ID of the deleted document.

The adapter then forwards the business object to the endpoint, which is an exposed interface from an SCA module that offers a business service to the outside world. Business objects contain the information that the adapter obtains from a document as a form.

Use the following steps to process the inbound events:

1. Create a subscription on the FileNet Content Engine.
2. Poll events from the event table.
3. Retrieve the relative business object based on the event type. For a delete event type, only the Object ID of the form is retrieved.
4. Deliver the business object to the endpoint.

Support for the Log and Trace Analyzer

The adapter creates log and trace files that can be viewed with the Log and Trace Analyzer.

The Log and Trace Analyzer can filter log and trace files to isolate the messages and trace information for the adapter. It can also highlight the adapter's messages and trace information in the log viewer.

The adapter's component ID for filtering and highlighting is a string composed of the characters ECMRA plus the value of the adapter ID property. For example, if the adapter ID property is set to 001, the component ID is ECMRA001.

If you run multiple instances of the same adapter, ensure that the first eight characters of the adapter ID property are unique for each instance so that you can correlate the log and trace information to a particular adapter instance. By making the first seven characters of an adapter ID property unique, the component ID for multiple instances of that adapter is also unique, allowing you to correlate the log and trace information to a particular instance of an adapter. For example, when you set the adapter ID property of two instances of WebSphere Adapter for Enterprise Content Management to 001 and 002. The component IDs for those instances, ECMRA001 and ECMRA002, are short enough to remain unique, enabling you to distinguish them as separate adapter instances. However, instances with longer adapter ID properties cannot be distinguished from each other. If you set the adapter ID properties of two instances to Instance01 and Instance02, you will not be able to examine the log and trace information for each adapter instance because the component ID for both instances is truncated to ECMRAInstance.

For outbound processing, the adapter ID property is located in both the resource adapter and managed connection factory property groups. If you update the adapter ID property after using the external service wizard to configure the adapter for outbound processing, be sure to set the resource adapter and managed connection factory properties consistently. It prevents inconsistent marking of the log and trace entries. For inbound processing, the adapter ID property is located only in the resource adapter properties, so this consideration does not apply.

For more information about the adapter ID property, see . For more information about the Log and Trace Analyzer, see http://publib.boulder.ibm.com/infocenter/wasinfo/v6r0/topic/org.eclipse.hyades.log.ui.doc.user/concepts/cltaviews.htm.

Chapter 2. Samples and tutorials

To help you use WebSphere Adapters, samples and tutorials are available from the Business Process Management Samples and Tutorials Web site.

You can access the samples and tutorials in either of the following ways:

- From the welcome page of WebSphere Integration Developer, click **Go to Samples and Tutorials**. In the Samples and Tutorials pane, under More samples, click **Retrieve**. Browse the displayed categories to make your selection.
- From the Business Process Management Samples and Tutorials Web site: http://publib.boulder.ibm.com/bpcsamp/index.html.

Chapter 3. Configuring the module for deployment

To configure the adapter so that it can be deployed on WebSphere Process Server or WebSphere Enterprise Service Bus, use WebSphere Integration Developer to create a module, which is exported as an EAR file when you deploy the adapter.

Creating an authentication alias

An authentication alias is a feature that encrypts the password used by the adapter to access the Content Management Repository. The adapter can use it to connect to the Content Management Repository instead of using a user ID and password stored in an adapter property.

Before you begin

To create an authentication alias, you must have access to the administrative console of WebSphere Process Server or WebSphere Enterprise Service Bus. You must also know the user name and password to use to connect to the Content Management Repository.

The following procedure describes how to access administrative console through WebSphere Integration Developer. If you are using the administrative console directly (without going through WebSphere Integration Developer), log in to the administrative console and skip to step 2.

About this task

Using an authentication alias eliminates the need to store the password in clear text in an adapter configuration property, where it might be visible to others.

To create an authentication alias, use the following procedure.

Procedure

1. Start the administrative console:

   To start the administrative console through WebSphere Integration Developer, perform the following steps:

   a. In the Business Integration perspective of WebSphere Integration Developer, click the **Servers** tab.

   b. If the server does not show a status of **Started**, right-click the name of the server (for example, **WebSphere Process Server**) and click **Start**. Wait until the status of the server is Started.

   c. Right-click the name of the server and click **Run administrative console**.

   d. Log on to the administrative console by clicking **Log in**. If your administrative console requires a user ID and password, type the ID and password first and click **Log in**.

2. In the administrative console, click **Security** → **Secure administration, applications, and infrastructure**.

3. Under **Authentication**, click **Java Authentication and Authorization Service** → **J2C Authentication data**.

4. Create an authentication alias

   a. From the list of J2C authentication aliases that is displayed, click **New**.

b. In the **Configuration** tab, type the name of the authentication alias in the **Alias** field.

c. Type the user ID and password that are required to establish a connection to the CMIS server.

d. Optional: Type a description of the alias.

e. Click **OK**.

The newly created alias is displayed.

The full name of the alias contains the node name and the authentication alias name you specified. For example, if you create an alias on the node widNode with the name ProductionServerAlias, then the full name is widNode/ProductionServerAlias. This full name is the one you use in subsequent configuration windows.

f. Click **Save**.

Results

You have created an authentication alias, which you specify when you configure the adapter properties later in the wizard.

Creating the module

A module encapsulates the service in a reusable unit and consists of both a project in WebSphere Integration Developer and a unit of deployment to WebSphere Process Server or WebSphere Enterprise Service Bus. The module is packaged and deployed to WebSphere Process Server or WebSphere Enterprise Service Bus as an enterprise archive (EAR) file.

Procedure

1. If WebSphere Integration Developer is not currently running, start it now.

   a. Click **Start** → **Programs** → **IBM WebSphere** → **Integration Developer V7.0** → **WebSphere Integration Developer V7.0**.

   b. If you are prompted to specify a workspace, either accept the default value or select another workspace.

   The workspace is a directory where WebSphere Integration Developer stores your project.

   c. Optional: When the WebSphere Integration Developer window is displayed, click **Go to the Business Integration perspective**.

2. Right-click inside of the Business Integration section of the WebSphere Integration Developer window.
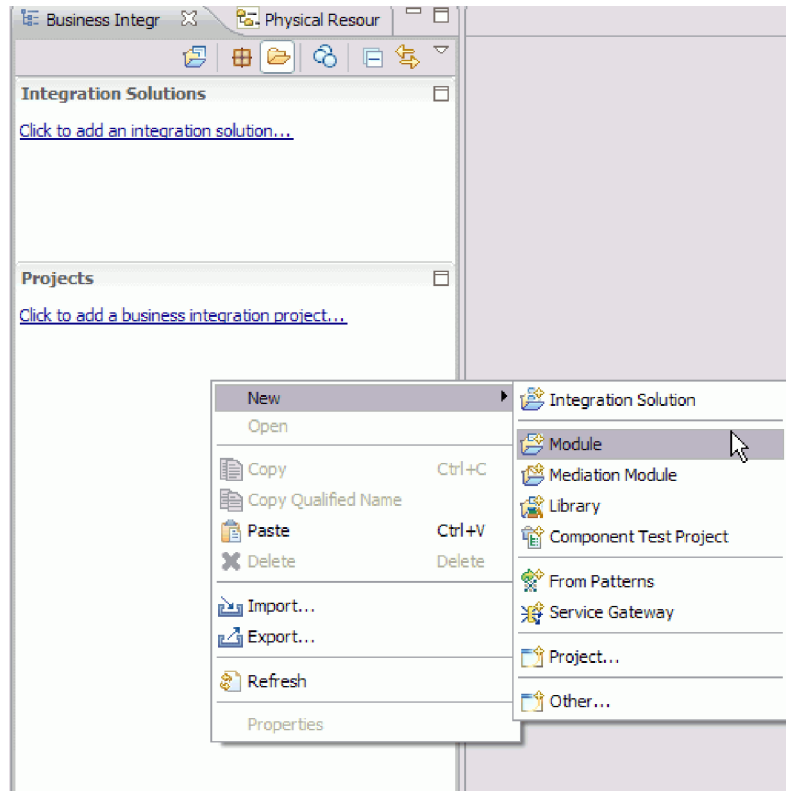
Figure 16. Business Integration section of the window

3. In the New Module window, type a name for the module in the **Module Name** field. For example, to configure a module for outbound processing, type `Outbound` as the module name. Click **Finish**.

Results

A new module is listed in the Business Integration window.

Creating the project

To begin the process of creating and deploying a module, you start the external service wizard in WebSphere Integration Developer. The wizard creates a connector project, which is used to organize the files associated with the module.

Before you begin

Make sure that you have gathered the information you need to establish a connection to the CMIS server. For example, you need the name or IP address of the CMIS server and the user ID and password needed to access it.

About this task

If you have an existing project, you can use it instead of creating a new one. Select it before you start the wizard.

Procedure

1. To start the external service wizard, go to the Business Integration perspective of WebSphere Integration Developer, and then click **File** → **New** → **External Service**.

2. Click **Next**.

3. In the New External Service window, expand the **Adapters** folder and select **Enterprise Content Management**.

4. Click **Next**.

5. In the Select an Adapter window, select **IBM WebSphere Adapter for Enterprise Content Management (IBM :** *version***)**, where *version* is the version of the adapter you want to use, for example, 7.0.0.0.

6. Click **Next**.

7. In the Import a RAR File window, accept the default project name in the **Connector project** field or type a different name.

8. In the **Target runtime** field, select the type of server where you want to deploy the module. The wizard creates the artifacts that are appropriate to that server.

9. Click **Next**. The Locate the Required Files and Libraries window is displayed.

Results

A new connector project is created, which contains the adapter RAR file. The project is listed in the Business Integration perspective .

What to do next

Continue working in the external service wizard. The next step is to add database-specific files to the project.

Selecting the processing direction

The adapter processing direction can be configured at run time environment. You can either configure your adapter for inbound processing or outbound processing.

Before you begin

Ensure that you are running the external service wizard in WebSphere Integration Developer to perform this task.

About this task

When you configure your adapter for inbound processing you are processing the request or response interaction from the adapter to your service export . When you configure your adapter for outbound processing you are processing the response from your service import to the adapter.

In the Select the Processing Direction window, select **Outbound** or **Inbound**, and then click **Next** to advance to the Connection properties window.

Results

You have defined the type of process you need for your adapter.

Configuring the module for outbound processing

To configure a module to use the adapter for outbound processing, use the external service wizard in WebSphere Integration Developer to find and select business objects and services from the CMIS server, and to generate business object definitions and related artifacts.

Setting connection properties for the external service wizard

For the external service wizard to be able to discover business objects on the CMIS server, you must specify the connection properties.

About this task

The external service wizard requires these properties to connect to the CMIS server to discover and to create the service description.

Procedure

1. Start the external service wizard and enter the appropriate information in the Select the Processing Direction window, as explained in the "Selecting the processing direction" on page 22 topic.

2. In the Specify the Discovery Properties window, specify the connection properties for the wizard to connect to the CMIS server. The connection information from this window is used by the adapter to connect to the CMIS server and discover business objects. In this same wizard at a later time, you can also change the connection information or an authentication alias to be used at run time.
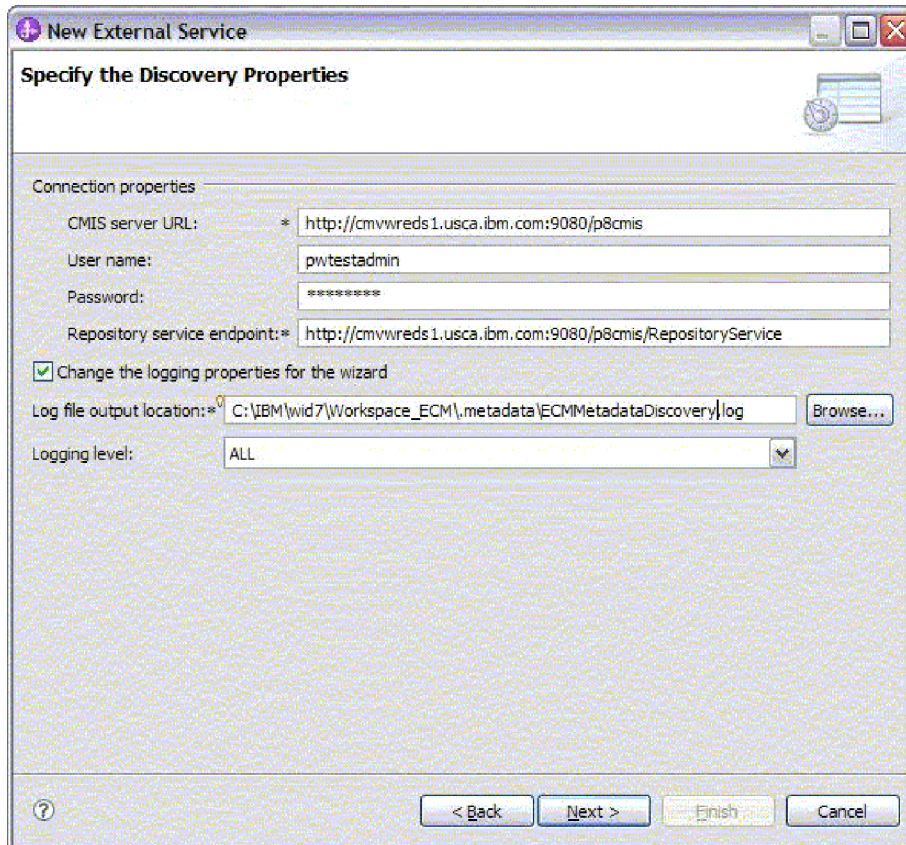
Figure 17. Specifying the connection properties

      a. In the **CMIS server URL** field, specify the URL of the CMIS end point.

      b. In the **User name** field, enter the user name used to connect to the server.

      c. In the **Password** field, enter the password used to connect to the server.

      d. The adapter automatically populates the **Repository Service Endpoint** field with the Endpoint Address of CMIS server followed by **/RepositoryService**. For the purpose of discovering information about the repository, including information about the object-types defined for the repository, the adapter requires a Repository Service Endpoint URL as per the CMIS specification. If you configured your Repository Service endpoint with a different format, you can edit the default setting.

3. Optional: To specify the logging level, click **Change the logging properties for the wizard**, and then provide the following information:

   - In **Log file output location**, specify the location of the log file for the wizard.
   - In **Logging level**, specify the severity of errors that you want logged.

   This log information is for the wizard only; at run time, the adapter writes messages and trace information into the standard log and trace files for the server.

4. Click **Next**.

Results

The external service wizard connects to the database and displays the Find Objects in the Enterprise System window.

What to do next

Continue working in the wizard. Locate the objects on the CMIS server for which you want the wizard to create business objects.

Discovering and selecting objects

After connecting to the CMIS server, you can browse through the list of Content Management Repositories at that service endpoint tree of discovered objects to understand the structure of Document Types in the Content Management Repository.

Before you begin

You must have successfully connected to the CMIS server. You must have a clear understanding of the data requirement of the program that needs to access the Content Management Repository.

About this task

This task starts in the Find Objects in the Enterprise System window of the external service wizard.

Procedure

1. In the **Discovered objects** list, click **+** (the plus sign) next to the required Repository node, to see the Document types discovered by the wizard.
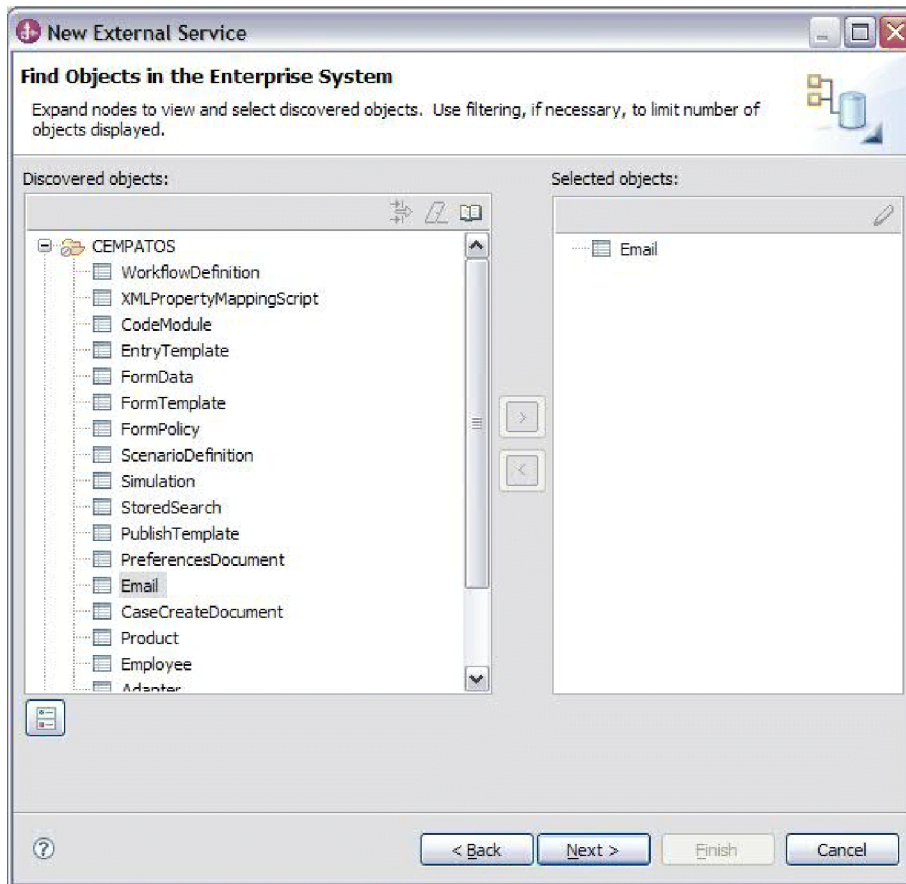
Figure 18. Finding objects in the Enterprise System

2. Select the required objects from the **Discovered objects** listing and use the

    (Add) button to add them to the **Selected objects** listing.

3. The Specify the Configuration Properties for 'object' window is displayed.

Results

The wizard displays the document objects you have selected to be used by the adapter.

What to do next

Continue working in the external service wizard. The next step is to specify the configuration properties for the selected objects you want to use in your module, configure each business object, and create hierarchies of business objects.

Selecting and configuring business objects

Using the list of Content Management Repositories discovered by the external service wizard, select the document types that you need to access in your module, then provide configuration information for your new business objects.

About this task

The Find Objects in the Enterprise System window allows you to select and configure objects in any order. You have the flexibility to add objects individually or to add them several at a time. You can mix objects from the various nodes of the **Discovered objects** list.

The high-level flow of selecting and configuring business objects is as follows:

1. Select one or more Document types in the **Discovered objects** list of the Find Objects in the Enterprise System window.
2. Click the **>** (Add) button.
3. The wizard opens the Specify the Configuration Properties for 'object' window.
    - If you select a single object, a single Specify the Configuration Properties for 'object' window is displayed.
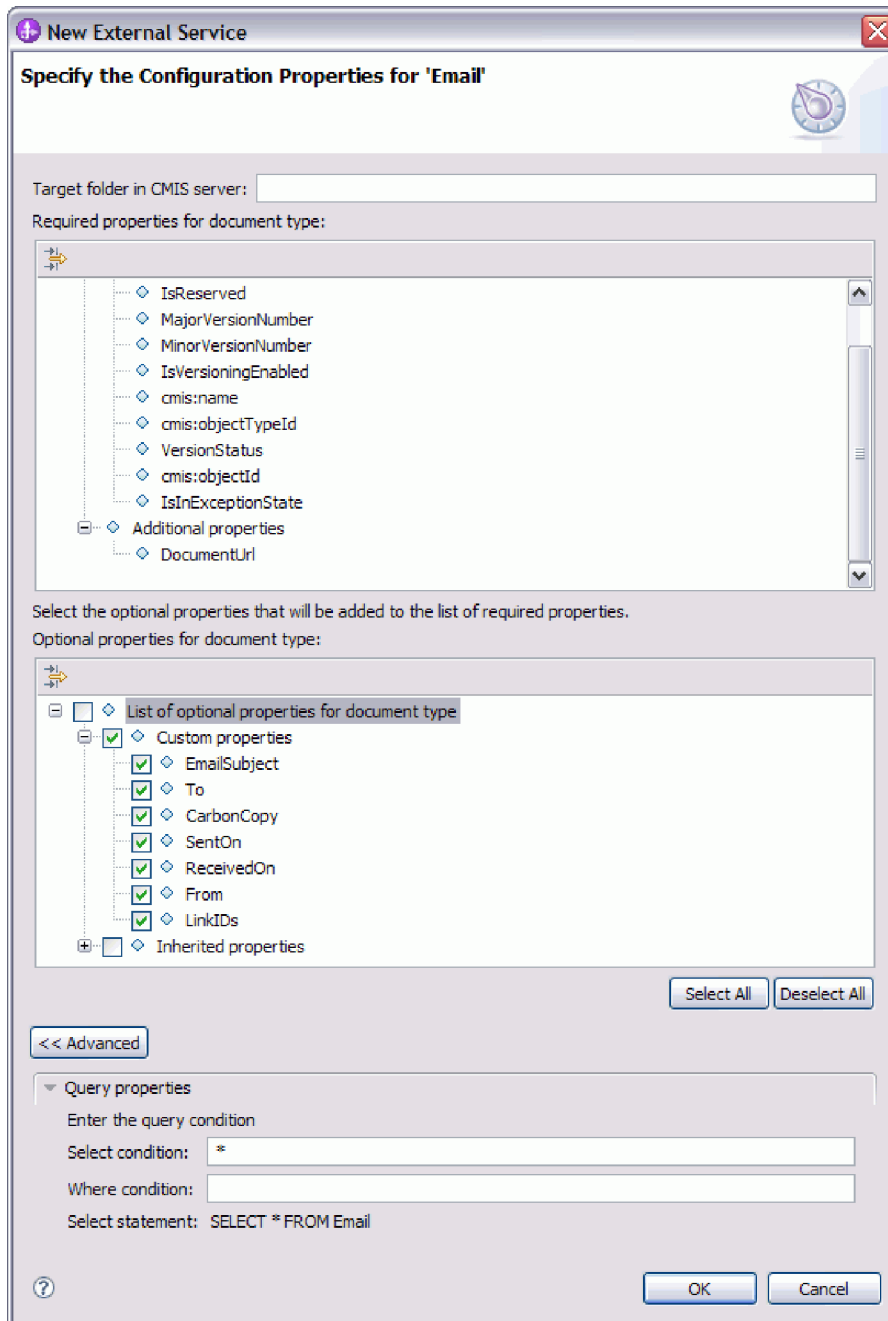
Figure 19. Specifying the configuration properties

- In the Target folder in the CMIS server field, enter the folder name.

  Note: For more information on the DocumentUrl property, refer to "RetrieveProperties operation" on page 8
- Select the optional properties that you wish to see in your final Business Object from the list of **Custom Properties** and **Inherited Properties**. These properties are ones that the wizard cannot discover by examining the database.
- If you select multiple objects, the Specify the Configuration Properties for 'object' window displays with one page for each object selected.

Click the name of each object in turn. The window displays the same information you would see had you selected this object individually.

Important: Do not click **OK** until you complete the configuration pages for all the objects. The wizard does not close the notebook until you provide all the required fields, but you can close the window before providing optional fields. If you do not configure the optional fields in the wizard, you must use the business object editor to configure them after exiting the wizard.

4. The wizard adds the configured object to the **Selected objects** list.
5. Click **Advanced**. Expand the advanced sections to review and specify the following options:

   Enter the query conditions after expanding the **Query Properties** tab.

   - In the **Select Condition** field, enter the Select clause from Email, for example, **To**
   - In the **Where Condition** field, enter the Where clause from Email, for example, **sender = 'johndoe@us.ibm.com'**

Note: The target document and it's properties should define the appropriate query Name to use the RetrieveAll feature. Refer to the CMIS specification section 2.1.10 Query for more details on how to construct a valid query.

As long as you do not exit from the wizard, you can work iteratively to select and configure the business objects you need in your module. However, before you start the wizard to add objects to an existing module, understand the requirements of the program that uses the business objects carefully. The wizard overwrites the existing business objects in the same path.

Related information

⇨ http://docs.oasis-open.org/cmis/CMIS/v1.0/os/cmis-spec-v1.0.html

Configuring the selected objects

After you have selected metadata object in the external service wizard, you need to specify properties that apply to them.

Procedure

1. When the **Selected objects** list in the Find Objects in the Enterprise System window contains all the business objects you want to use in your application, click **Next**.
2. In the Specify Composite Properties window, the supported outbound operations are listed in the **Operations** field. The operations available for you to configure are: Create, Delete, Retrieve, RetrieveProperties, Update, UpdateProperties and RetrieveAll.
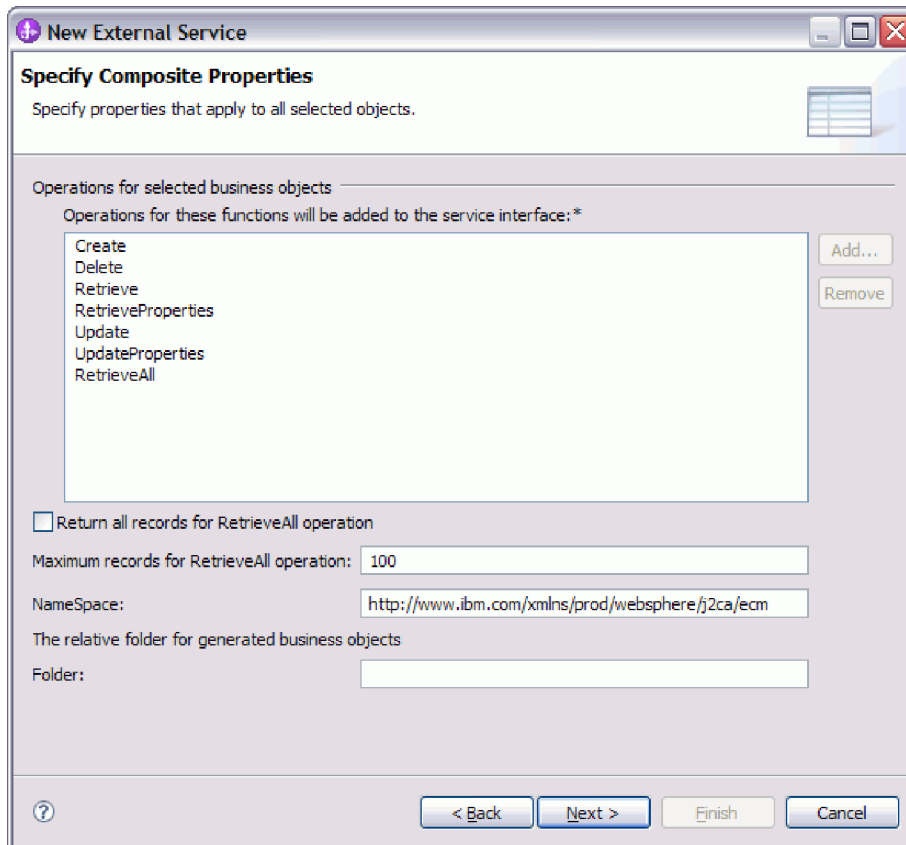
Figure 20. Specify Composite Properties

3. To configure an operation, you can use either the **Add** or the **Remove** option. If you remove any of these operations, the removed operation is made available in the Add Value window for you to add back. Use the **Add** option again to open the Add Value window and select the operations to be added back.

4. Specify how you want to retrieve the records.
   - If you want the RetrieveAll operation to return all records matching the query, select the **Return all records for RetrieveAll operation** check box.
   - If you want to specify how many records the RetrieveAll operation must return, enter a value in the **Maximum records for RetrieveAll operation** field or enter -1 in the **Maximum records for RetrieveAll operation** field. The default value is 100. For more information about this property, see "Maximum records for RetrieveAll operation" on page 97.

   Note: The "Maximum records for RetrieveAll operation" on page 97 property applies only if you are using the RetrieveAll operation. This property field is disabled (unavailable for use) if you remove the RetrieveAll operation in step3 or if you select the **Return all records for RetrieveAll operation** check box.

5. In the **Namespace** field, either accept the default namespace or type the full name of another namespace.

   The namespace is prefixed to the business object name to keep the business object schemas logically separated.

6. Optional: In the **Folder** field, type the relative path to the folder where the generated business objects are to be stored. Click **Next**.

Note: If you are creating multiple adapter artifacts within a module, ensure that you specify different business object folders for each adapter within the module. For example, if you are creating artifacts for Oracle, JDBC, SAP, and JDE within a module, you need to create different relative folders for each of these adapters. If you do not specify different relative folders, the existing artifacts are overwritten when you generate new artifacts.

Note: If you are creating inbound and outbound artifacts within a module, ensure that you specify different business object folders each for inbound and outbound business objects. If you do not specify different relative folders, the existing artifacts are overwritten when you generate new artifacts, resulting in runtime failure.

Results

You have provided information that applies to all business objects in the module.

What to do next

Continue working in the wizard. The next step is to specify deployment information to use at run time and information for saving the service as a module.

Setting deployment properties and generating the service

After you select and configure business objects for your module, use the external service wizard to configure properties that the adapter uses to connect to a CMIS server system. The wizard creates a new business integration module where all the artifacts and property values are saved. This task is performed using the Specify the Service Generation and Deployment Properties and Specify the Location Properties windows of the external service wizard.

Results

The module is created in the project and artifacts are generated.

Setting deployment properties for a runtime environment

The connection properties are initialized to the values that the wizard used to connect to the database. To configure the module to use other values, change values such as user name and password here.

Before you begin

Ensure that you have configured the business object.

About this task

To generate artifacts for your module, use the following procedure:

Procedure

1. In the Specify the Service Generation and Deployment Properties window, click **Edit Operations** to review the names of or add a description for the operations for the business objects that you are creating.
2. In **Deployment Properties**, specify how you want the adapter to connect to the CMIS server by selecting any one of these authentication methods.
   - To use a J2C authentication alias, click **Using an existing JAAS alias (recommended)** and type the name of the alias in the **J2C authentication**

data entry field. You can either specify an existing authentication alias or create one at any time before deploying the module. The name is case sensitive and includes the node name.

- To use the security properties from the managed connection properties, click **Using security properties from the managed connection factory** and enter the following information:
  - In the **User name** field, type the user name to connect to the CMIS server.
  - In the **Password** field, type the password to connect to the CMIS server.

    Note: The security properties are not encrypted and stored as plain text.
- To use any other method of authenticating to the CMIS server, click **Other**.
3. In the **Deploy connector project** field, specify whether to include the adapter files in the module. Select one of the following values:
   - **With module for use by single application**: With the adapter files embedded in the module, you can deploy the module to any application server. Use an embedded adapter when you have a single module using the adapter or if multiple modules need to run different versions of the adapter. Using an embedded adapter enables you to upgrade the adapter in a single module without the risk of destabilizing other modules by changing their adapter version.
   - **On server for use by multiple applications**: If you do not include the adapter files in a module, you must install them as a stand-alone adapter on each application server where you want to run the module. Use a stand-alone adapter when multiple modules can use the same version of the adapter and you want to administer the adapter in a central location. A stand-alone adapter can also reduce the resources required by running a single adapter instance for multiple modules.
4. If you selected **On server for use by multiple adapters** in the previous step, specify how you want to set the connection properties at runtime.
   - If you manually created and configured a managed connection factory or activation specification on the server or if you have already deployed an application that connects to the same CMIS server using the same managed connection factory or activation specification properties, you can reuse the managed connection factory or activation specification by specifying the name of its Java Naming and Directory Interface (JNDI) data source:
     a. In **Connection properties**, select **Use predefined connection properties**.
     b. In **JNDI Lookup Name**, type the name of the JNDI data source for an existing managed connection factory or activation specification.
     c. Click **Next**.
   - If this application is the first one that connects to the database with a specific user name and password, or if you want to administer the user name and password separately from other applications, select **Specify connection properties**.
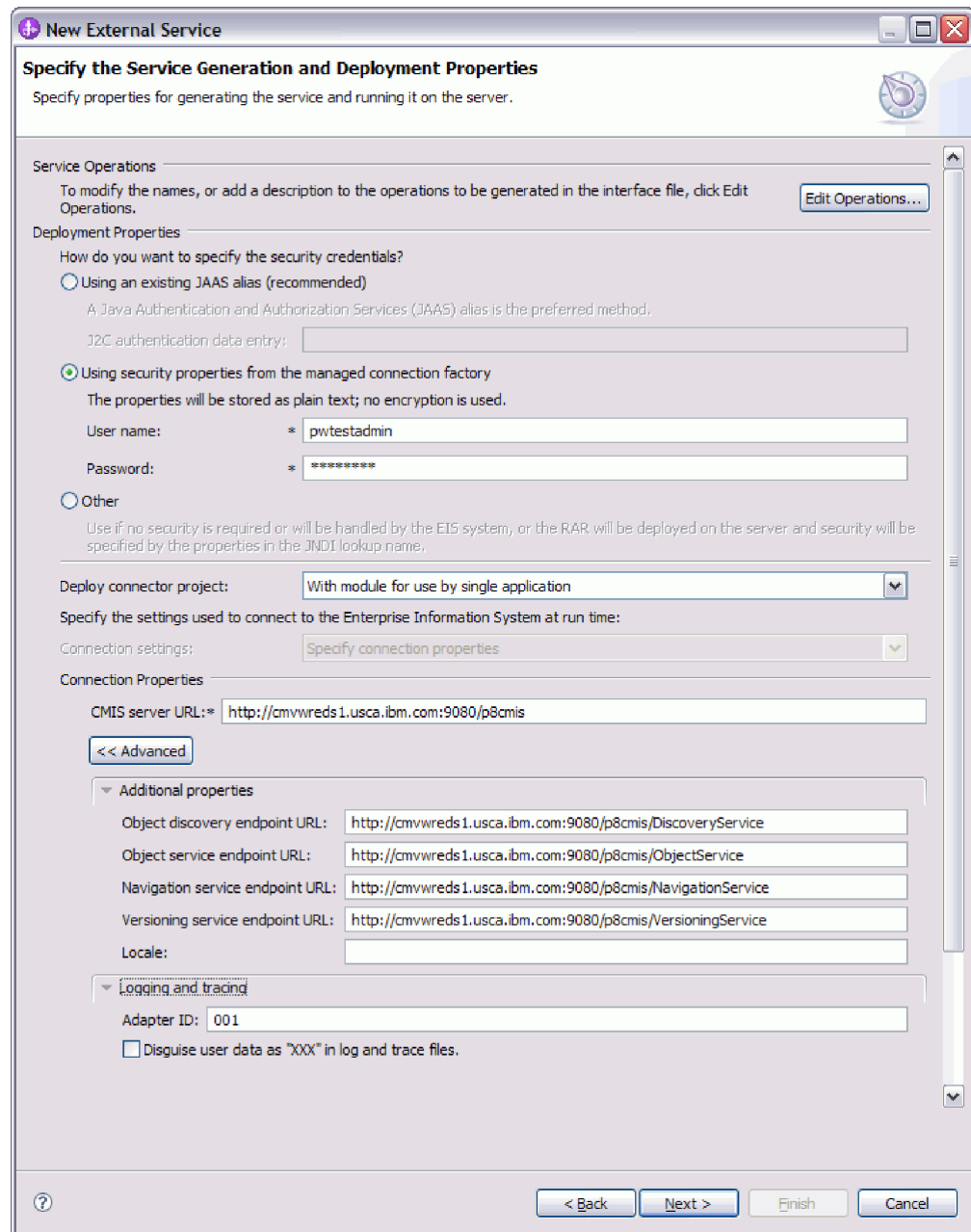
Figure 21. Specify the service generation and deployment properties window

5. Optional: Review and if necessary, change the values of the required connection properties. The fields are initialized with the connection information you specified when you started the wizard.

   - **Connection properties**

     – In the **CMIS server URL** field, type the URL to connect to the CMIS end point.

6. Click **Advanced**. Expand the advanced sections to review and specify the following options:

   - **Additional Properties**

     a. In the **Object discovery endpoint URL** field, you can execute the query made during RetrieveAll operation. The default content in this field is the CMIS server URL followed by **/DiscoveryService**.

For example, http://hostname:portnumber/contextroot/DiscoveryService

    b. In the **Object service endpoint URL** field, you can update the URL for performing ID-based CRUD (Create, Retrieve, Update, Delete) operations on Objects in a Content Management Repository. The default content in this field is the CMIS server URL followed by **/ObjectService**.

       For example, http://hostname:portnumber/contextroot/ObjectService

    c. In the **Navigation service endpoint URL** field, you can update the URL used to traverse the folder hierarchy in a Content Management Repository, and to locate Documents that are checked out. The default content in this field is the CMIS server URL followed by **/NavigationService**

       For example, http://hostname:portnumber/contextroot/NavigationService

    d. In the **Versioning service endpoint URL** field, you can update the URL used to navigate or update a Document Version Series. The defaults content in this field is the CMIS server URL followed by **/VersioningService**.

       For example, http://hostname:portnumber/contextroot/VersioningService

    e. In the **Locale** field, type the preferred language. For example, English (en_US).

- **Logging and tracing**

    a. If you have multiple instances of the adapter, set Adapter ID to a value that is unique for this instance.

    b. You can select the **Disguise user data as 'XXX' in log and trace files** check box to prevent sensitive user data from being written to log and trace files.

7. Click **Next**.

Results

The Specify the Location Properties window is displayed.

Setting location properties for artifacts

After you select and configure deployment properties, use the external service wizard to configure location properties that the adapter uses to generate the service.

Before you begin

Ensure that you have configured the business object.

About this task

To configure location properties for your module follow this procedure:

Procedure

1. In the Specify the Location Properties window, select an existing module or create a new one.

- To use an existing module, select its name from the **Module** list.

    Important: If the module contains an interface or business object with the same name as that you are now configuring, the original interface or business object in the module is replaced by the new version.

- To create a new module:
  a. Click **New**.
  b. In the Select a Business Integration Project Type window, select **Module** and click **Next**.
  c. In the Create a Module window, type a name for the module in the **Module name** field.
  d. To retain the service description files (the `.import` and the `.wsdl` files) to be located in the default folder in the module, leave the **Use default location** check box selected. To specify a different folder in the module, clear the **Use default location** check box, and then click **Browse** to specify a different folder in the **Location** field.
  e. To automatically open the module in the assembly diagram in WebSphere Integration Developer when the wizard closes, select the **Open the module assembly diagram** check box.
  f. Click **Finish** to create the module.

2. Specify the namespace you want to use for your outbound interface.
   - Select **Use the default namespace** check box to retain the outbound interface to use the default derived namespace. By default, this check box is selected.
   - To specify a different namespace, clear **Use the default namespace** check box and type a different value in the **Namespace** field.

3. Specify the folder in the new module where the service description is to be saved. In the **Folder** field, type the folder name or browse to an existing folder. If you do not specify a folder name, the artifacts (the import, XSD, and WSDL files) are stored in the root folder of the module (the folder with the module name).

4. In the **Name** field, accept the default import name or type a different name.

5. If you want to save business objects in a library where they can be used by other modules, select **Save business objects to a library** check box and specify the location of the library in the **Library** field.

6. In the **Description** field, type a descriptive comment about the module.

7. Click **Finish** to complete the setting of location properties.

   Note: If the Model Changed window is displayed, click **Yes**.

   Results

   The wizard exits. The artifacts are generated.

Configuring the module for inbound processing

To configure a module to use the adapter for inbound processing, first create a subscription on the FileNet Content Engine then use the external service wizard in WebSphere Integration Developer to find and select business objects and services from the CMIS server, and to generate business object definitions and related artifacts.

Configuring the FileNet Content Engine for inbound processing

To configure a module to use the adapter for inbound processing, the first step is to set up subscriptions and deploy the EventHandler file on the FileNet Content Engine. The subscriptions are created by choosing a document type, and then creating a corresponding **Event Action**. The **Event Action** is set up using a **Code**

Module, where you deploy the `ECMEventHandler.jar` into the FileNet Content Engine system. The details that are generated when you create a subscription, are used during the external service wizard discovery.

Setting up a Subscription on the FileNet Content Engine

To set up the adapter for Inbound processing, use the Content Engine Subscription Wizard to create subscriptions on a Content Management Repository system, such as the FileNet Content Engine, for the object class you select.

Before you begin

You must have successfully connected to the CMIS server. You must have a clear understanding of the data requirement of the program that needs to access the Content Management Repository.

About this task

This task starts in the FileNet Enterprise Manager tree view, to select an object for which you want to create a subscription.

Procedure

1. Right click on the object for which you want to create a subscription. For example, if you want to create a subscription for **Document Class**, select **Object Stores > Repository name > Document Class**.
2. Select the target document type for which you need to create a subscription, for example **Email**.
3. Right click **Email** and select **Add Subscription** in the tree view.
4. The Content Engine Create a Subscription Wizard opens. This wizard will take you through the necessary steps to create a new subscription. Click **Next**.
5. The Create a Subscription screen is displayed
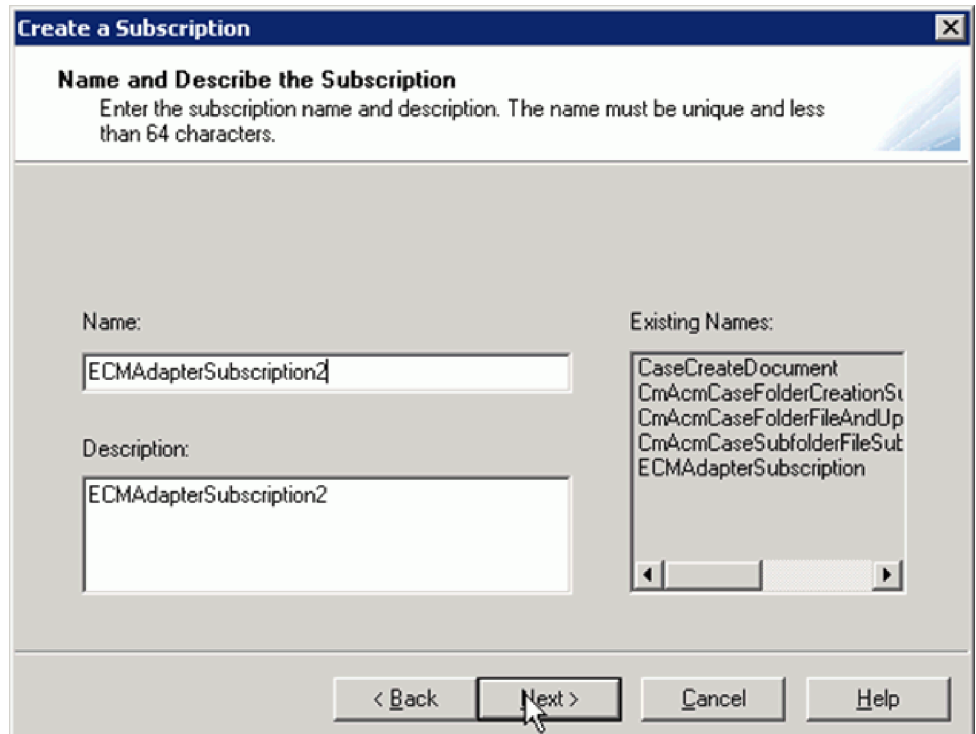
Figure 22. Naming and describing a Subscription

6. Enter a name for your subscription. This information is adapter-specific. You can enter any logical name, of your choice. You can also view existing subscription names in this screen. Click **Next**.

7. The Specify the Type of Object screen is displayed. Select the **Applies to all instances of class Email** option. When you choose this option, an event record is created for all instances of the Document type you choose, Email in this case. Click **Next**.

8. The Specify Triggers screen is displayed. You can activate triggers for the Create, Delete, and Updateevents. Select **Creation Event from the Available Events** pane, and click **Add** to take the event to the **Subscribed Events** pane. You can similarly add the **Deletion Event** and **Update Event** to your list of subscribed Events.
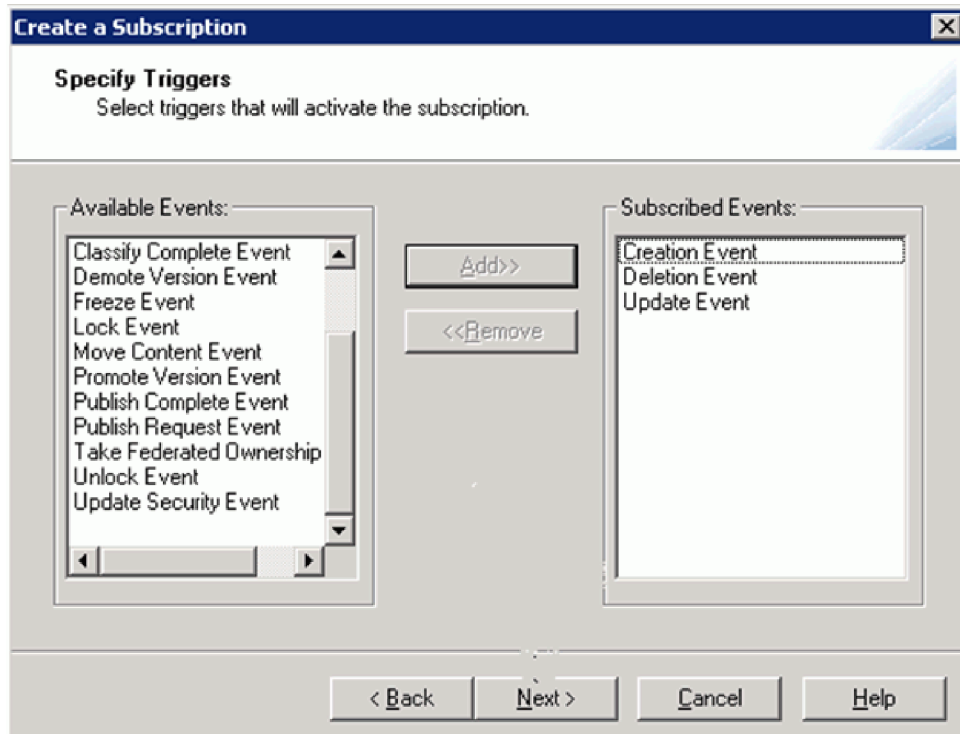
Figure 23. Specify Triggers

9. Click **Next**. The Specify the Event Action screen is displayed. Select an existing **Event Action** from the drop down menu if you have already created an event action. Or you can create a new event action.

10. Click **New** to create a fresh event action. Click **Next**.

Results

The Content Engine Create an Event Action Wizard is displayed.

What to do next

Continue working in the Content Engine Create an Event Action Wizard. The next step is to create and configure the Event Action.

Creating an Event Action on the FileNet Content Engine

Using the information from creating a subscription, create an Event Action using the of Content Engine Create an Event Action Wizard

Before you begin

You must have created a new event, or selected an existing event.

About this task

This task starts in the Content Engine Create an Event Action Wizardwindow. You can initiate the creation of a subscription.

Procedure
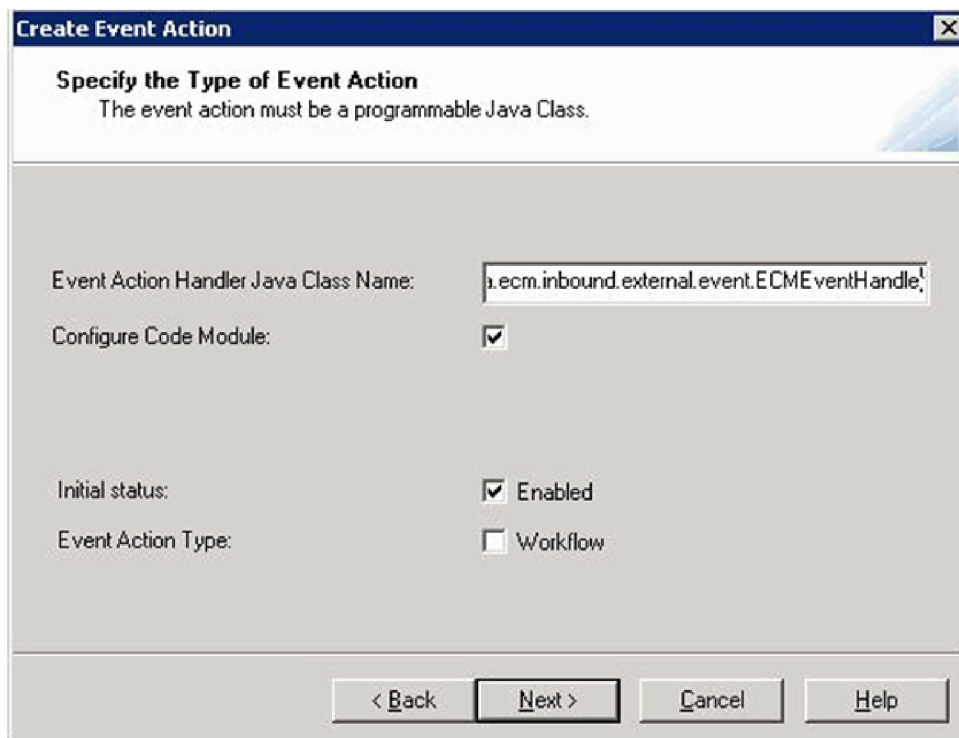
1. Make sure you have the **Specify Triggers** window open, where you can move available events to the subscribed events pane.

2. Click **Next**. The Name and Describe the Event Action window is displayed. Enter a name and description for your subscription. This information is adapter-specific. You can enter any logical name or description of your choice. You can view existing Event Action names in this window. Click **Next**.

   Important: Create a folder called **ECMAdapterEvents** at the root level. All events get generated inside the **/ECMAdapterEvents/** folder. Also, create a folder for **failed events**. These folders are required when you deploy the adapter on the target server runtime.

3. The Specify the Type of Event Actionto be configured window is displayed. Enter the **Event handler class name**. The complete class name of the EventHandler class for the Adapter for Enterprise Content Management is **com.ibm.j2ca.ecm.inbound.external.event.ECMEventHandler**. Check the **Configure Code Module** option to deploy the EventHandler JAR file that gets shipped with the adapter package.

   Note: Multiple events may be created in the event folder, as a result of event action, when a document is created or updated.

Figure 24. Creating an Event Action

4. Click **Next**.

Results

The Specify the Code Module to be configured window is displayed.

What to do next

Continue working in the Content Engine Create an Event Action Wizard. The next step is to configure the Code module.

Configuration properties for the Code Module

Configure the Code Module by selecting the appropriate dependent Java/Zip files.

Before you begin

You must have created a new event action, or opened an existing event on the FileNet Content Engine.

About this task

This task starts in the Specify the Code Module to be configured window, where you must have specified the type of event action.

Procedure

1. You can now configure the **Code Module** to deploy the JAR file in your Enterprise Content Manager system. Click **Browse/Add**. The Windows Explorer local drive option is displayed, with links to your Enterprise Content Manager system.
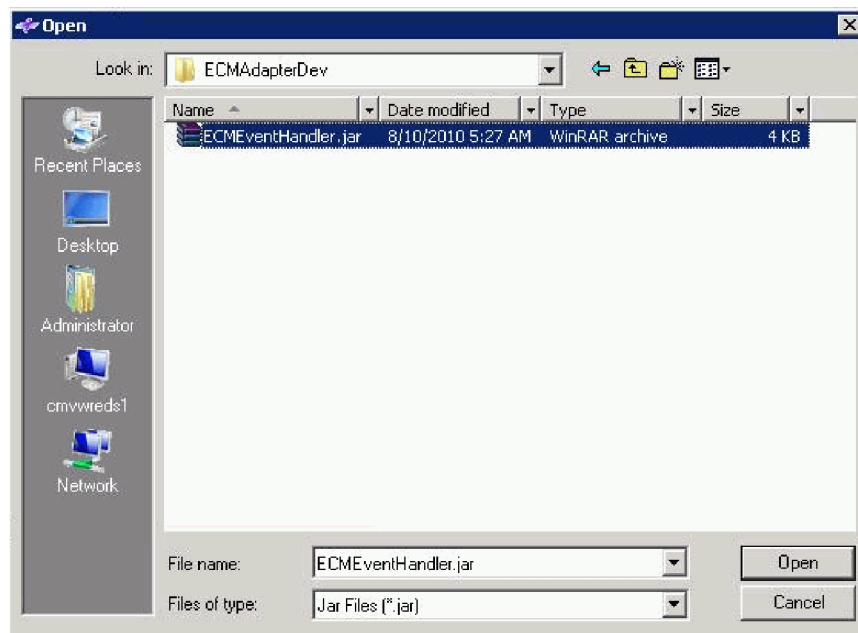
Figure 25. Selecting the ECMEventHandler JAR file window

2. Select the ECMEventHandler JAR file, and Click **Open**.
3. The Specify the Code Module to be configured window is displayed again. **Click Next**.
4. The Create Event Action window is displayed, confirming that the **Code Module** has been configured
5. Click **Finish**. A Confirmation message is displayed stating that you have successfully created an event action. Click **OK**.

Results

The Specify the Event Action window is displayed.

What to do next

Continue working in the Content Engine Create an Event Action Wizard. The next step is to complete the subscription.

Completing the Subscription creation

Complete creating the subscription using the configured Event Action in the Content Engine Create an Event Action Wizard

Before you begin

You must have successfully completed all the steps to configuring the Code Module.

About this task

This task starts in the Specify the Event Action window.

Procedure

1. Select an event action, and click **Next**.
2. The Specify Additional Properties window is displayed. Check the **Enabled Initial State** option. You can add optional information on the filtering options for **Expression** and **Property Name**. Click **Next**.
3. The Complete the Create a Subscription Wizard window is displayed. Click **Finish**. A Confirmation message stating that you have successfully created a subscription is displayed.

Results

You have successfully created a subscription on the FileNet Content Engine.

What to do next

Continue working in the FileNet Enterprise Manager to gather the required information to be used in the external service wizard.

Obtaining Subscription details

Gather the subscription details required to complete the external service wizard discovery.

Before you begin

You must have successfully completed all the steps to creating a subscription on the FileNet Content Engine.

About this task

This task starts in FileNet Enterprise Manager Manager to gather the required information be used in the external service.

Procedure

1. Click **Document Class> Subscriptions** in the tree view. Subscriptions are created in the `<REPO>\Events\Subscriptions` folder path.

2. Right click the subscription you have created, and select **Properties** in the menu option. The Properties window is displayed.
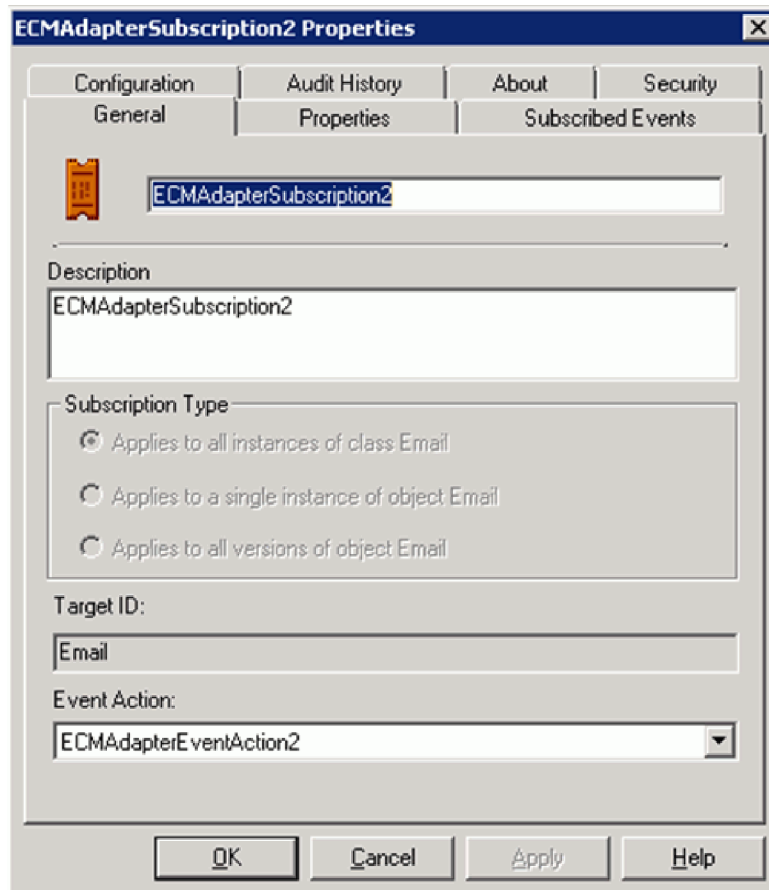
Figure 26. Subscription Properties

3. Click the **Properties** tab. Select the **All Properties** option in this window

4. Scroll down to obtain the ID value of the subscription you have created and click on the **display/edit values** button.
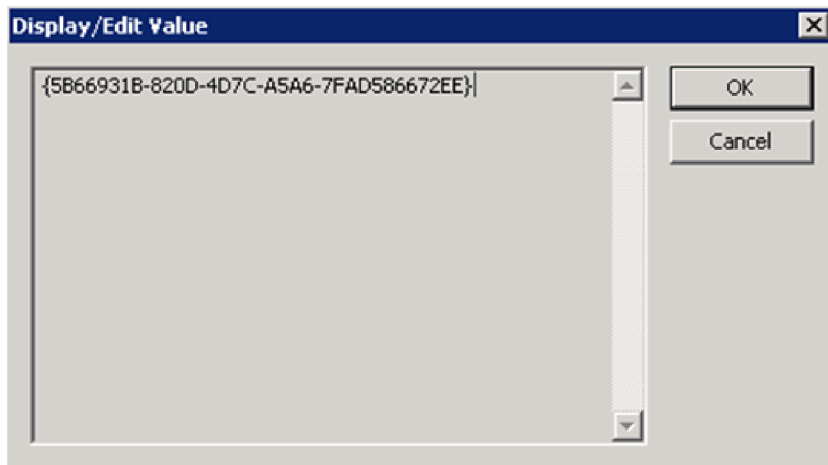
Figure 27. Display/Edit Value window

5. Select and copy this subscription ID, which is needed to run external service wizard of the Adapter for Enterprise Content Management

Results

You have successfully created a subscription on the FileNet Content Engine and retrieved the property details.

What to do next

Using the property details of the created subscription, continue working in the external service wizard to complete the inbound configuration.

Configuring the external service wizard for inbound processing

To configure a module to use the adapter for inbound processing, use the external service wizard in WebSphere Integration Developer to find and select business objects and services from the CMIS server, and to generate business object definitions and related artifacts.

Setting connection properties for the external service wizard

For the external service wizard to be able to discover business objects on the CMIS server, you must specify the connection properties.

About this task

The external service wizard requires these properties to connect to the CMIS server for discovery and for creating the service description.

Procedure

1. Start the external service wizard and enter the appropriate information in the Select the Processing Direction window, as explained in the "Selecting the processing direction" on page 22 topic.
2. In the Specify the Discovery Properties window, specify the connection properties for the wizard to connect to the CMIS server. The connection information from this window is used by the adapter to connect to the CMIS server and discover business objects. In this same wizard at a later time, you

can also change the connection information or an authentication alias to be used at run time.

Figure 28. Specifying the connection properties

    a. In the **CMIS server URL** field, specify the URL of the CMIS end point.

    b. In the **User name** field, enter the user name used to connect to the server.

    c. In the **Password** field, enter the password used to connect to the server.

    d. The adapter automatically populates the **Repository Service Endpoint** field with the Endpoint Address of CMIS server followed by **/RepositoryService**. For the purpose of discovering information about the repository, including information about the object-types defined for the repository, the adapter requires a Repository Service Endpoint URL as per the CMIS specification. If you configured your Repository Service endpoint with a different format, you can edit the default setting.

    e. In the **Repository** field, type in the Object Store name.

3. Optional: To specify the logging level, click **Change the logging properties for the wizard**, and then provide the following information:

- In **Log file output location**, specify the location of the log file for the wizard.
- In **Logging level**, specify the severity of errors that you want logged.

This log information is for the wizard only; at run time, the adapter writes messages and trace information into the standard log and trace files for the server.

4. Click **Next**.

Results

The external service wizard connects to the Content Management Repository and displays the Find Objects in the Enterprise System window.

What to do next

Continue working in the wizard. Locate the objects on the CMIS server for which you want the wizard to create business objects.

Discovering and selecting objects

After connecting to the CMIS server, you can browse the tree of discovered objects to select an object, such as Workflow Definition, CodeModule, Email, and so on. You can use the filtering mechanism to limit the number of objects to be displayed.

Before you begin
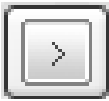
You must have successfully connected to the CMIS server. You must have a clear understanding of the object for which you want to specify the configuration properties.

About this task

This task starts in the Find Objects in the Enterprise System window of the external service wizard.

Procedure

1. Select the required objects from the **Discovered objects** listing and click the

   (Add) button to add that item to the **Selected objects** listing.
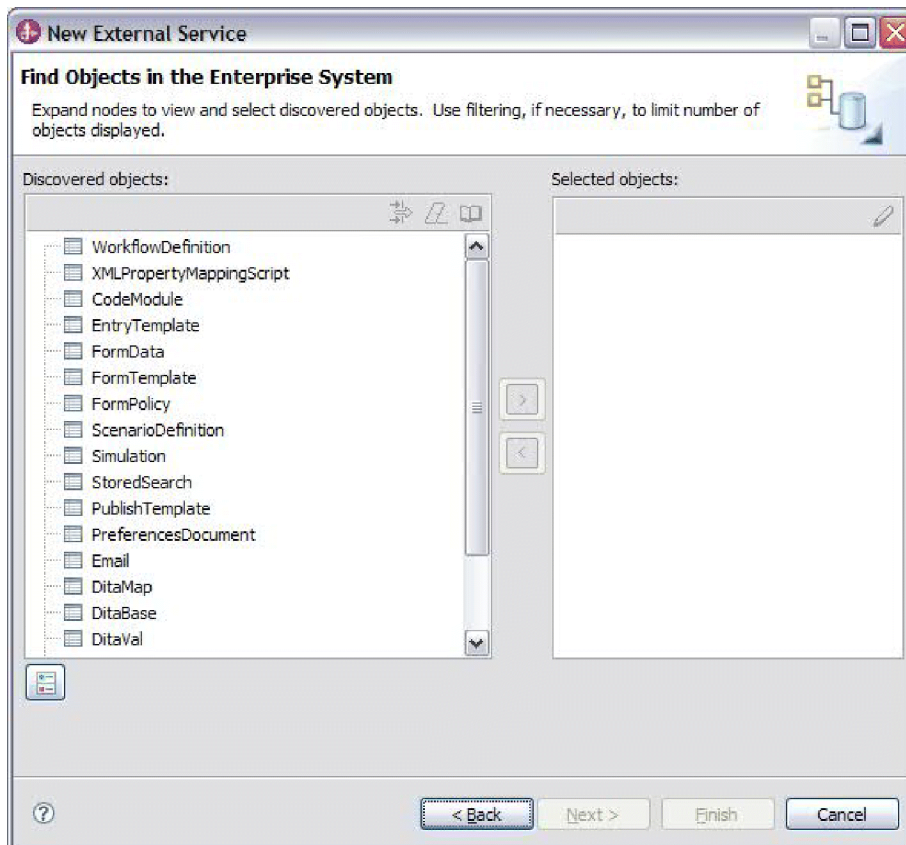
Figure 29. Finding objects in the enterprise system

2. Select the list of properties for the document type. The optional properties will get added along with the required properties.
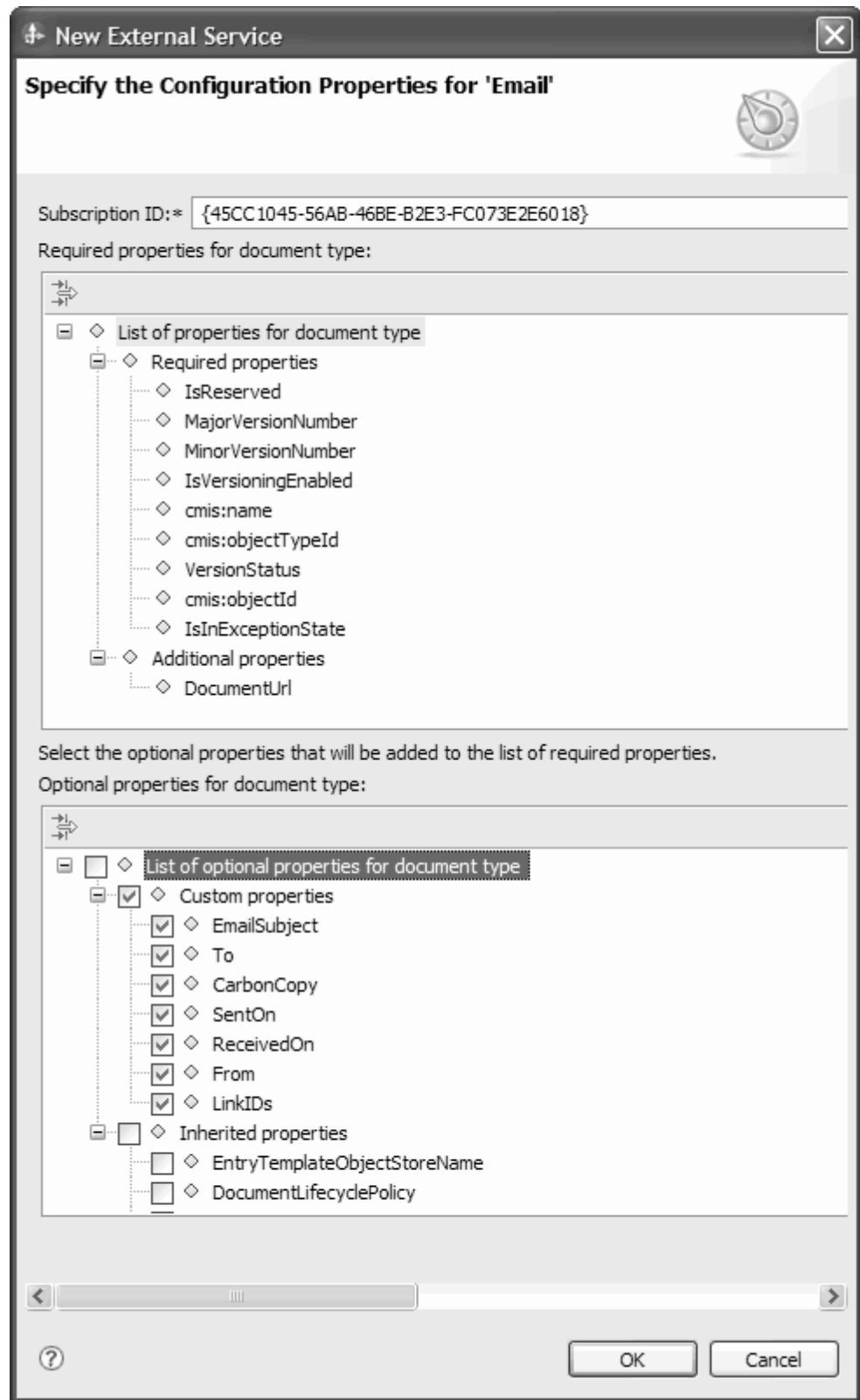
Figure 30. Setting additional configuration properties while selecting an object

3. Select the properties you want to be a part of the generated Business Object.

4. Enter the value of the Subscription ID for the document type.

5. Click **Select All** to assign the list of configuration properties.
6. Click Deselect All to cancel your choice, and reassign the list of configuration properties.

   Note: The **EventHandler** will create a subfolder in the name of subscription ID inside the **ECMAdapterEvents** folder and generate events inside the subfolder.

   Example: {377709E3-3078-4000-B16A-D3C0F72A4CD2}, where {377709E3-3078-4000-B16A-D3C0F72A4CD2} is the ID value of the subscription created.

Results

The wizard displays the selected object, in this case, Email, that you want to use with Adapter for Enterprise Content Management.

What to do next

Continue working in the external service wizard. The next step is to select the objects you want to use in your module, configure each business object, and create a hierarchy for that business object.

Configuring the selected objects

After you have selected the discovered object in the external service wizard, you must specify the properties that apply to that object.

Procedure

1. When the **Selected objects** list in the Find Objects in the Enterprise System window contains all the business objects you want to use in your application, click **Next**.
2. In the Specify Composite Properties window, the supported inbound operations are listed in the **Operations** field. The operations available for you to configure are: Create, Update, and Delete.
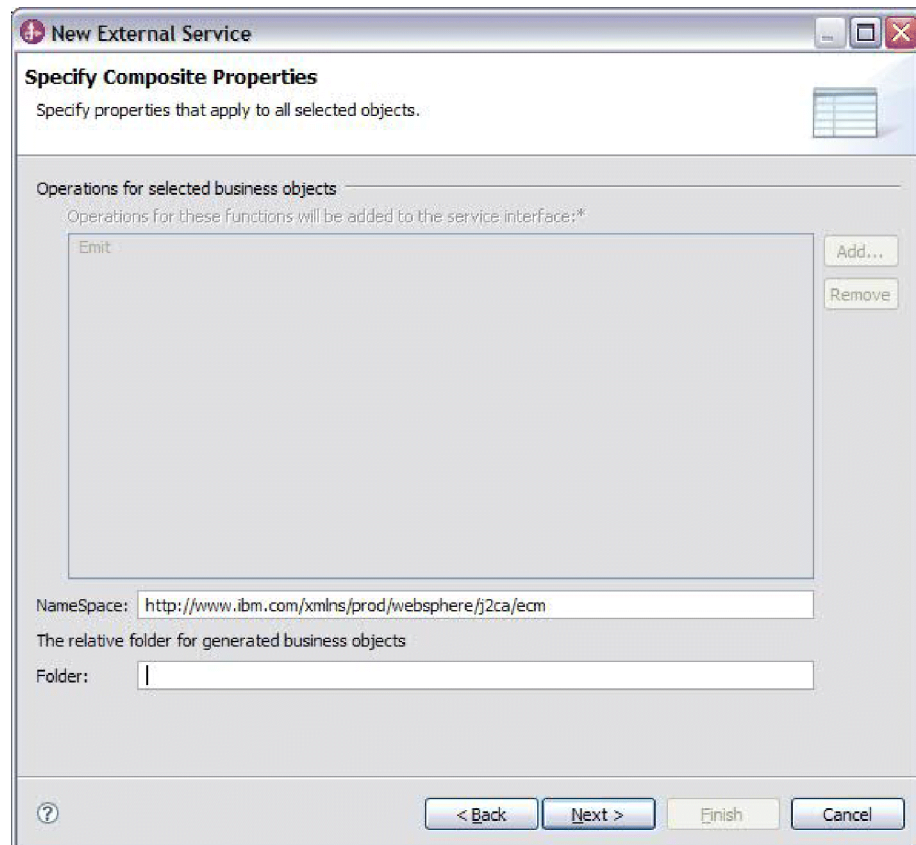
Figure 31. Specifying the composite properties

3. To configure an operation, you can use either the **Add** or the **Remove** option. If you remove any of these operations, the removed operation is made available in the Add Value window for you to add back. Use the **Add** option again to open the Add Value window and select the operations to be added back.

4. In the **NameSpace** field, either accept the default namespace or type the full name of another namespace.

   The namespace is prefixed to the business object name to keep the business object schemas logically separated.

5. Optional: In the **Relative folder for generated business objects** field, type the relative path to the folder where the generated business objects are to be stored. Click **Next**.

   Note: If you are creating multiple adapter artifacts within a module, ensure that you specify different business object folders for each adapter within the module. For example, if you are creating artifacts for Oracle, JDBC, SAP, and JDE within a module, you need to create different relative folders for each of these adapters. If you do not specify different relative folders, the existing artifacts are overwritten when you generate new artifacts.

Results

You have specified composite properties that apply to all the objects you have specified.

What to do next

Continue working in the wizard. The next step is to specify deployment information to use at run time and information for saving the service as a document type.

Setting deployment properties and generating the service

After you select and configure business objects for your module, use the external service wizard to configure properties that the adapter uses to connect to a CMIS server system. The wizard creates a business integration module where all the artifacts and property values are saved. This task is performed using the Specify the Service Generation and Deployment Properties and Specify the Location Properties windows of the external service wizard.

Results

The module is created in the project and artifacts are generated.

Setting deployment properties for a runtime environment:

The connection properties are initialized to the values that the wizard used, to find objects in the enterprise system. To configure the module to use other values, change values such as user name and password here.

Before you begin

This task is performed using the Specify the Service Generation and Deployment Properties window of the external service wizard.

About this task

To generate artifacts for your module, follow this procedure:

Procedure

1. In the Specify the Service Generation and Deployment Properties window, click **Edit Operations** to modify the name, or add a description to the operation to be generated.
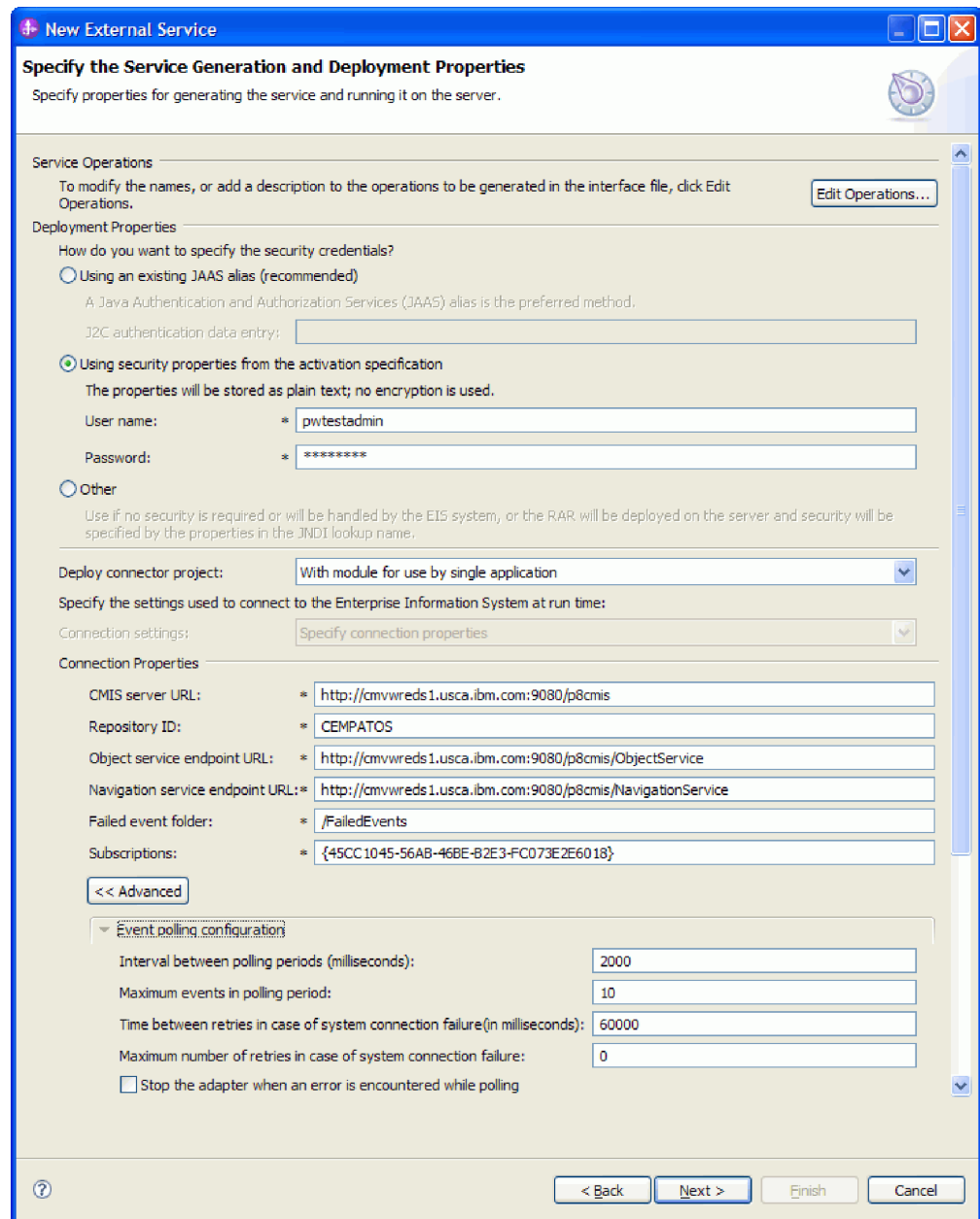
Figure 32. Specifying the service generation and deployment properties window

2. In **Deployment Properties**, specify how you want the adapter to connect to the CMIS server by selecting any one of these authentication methods.
   - To use a J2C authentication alias, click **Using an existing JAAS alias (recommended)** and type the name of the alias in the **J2C authentication data entry** field. You can either specify an existing authentication alias or create one at any time before deploying the module. The name is case sensitive and includes the node name.
   - To use the security properties from the managed connection properties, click **Using security properties from the managed connection factory** and enter the following information:
     – In the **User name** field, type the user name to connect to the CMIS server.
     – In the **Password** field, type the password to connect to the CMIS server.

Note: The security properties are not encrypted and stored as plain text.

- To use any other method of authenticating to the CMIS server, click **Other**.

3. In the **Deploy connector project** field, specify whether to include the adapter files in the module. Select one of the following values:

    - **With module for use by single application**: With the adapter files embedded in the module, you can deploy the module to any application server. Use an embedded adapter when you have a single module using the adapter or if multiple modules need to run different versions of the adapter. Using an embedded adapter enables you to upgrade the adapter in a single module without the risk of destabilizing other modules by changing their adapter version.

    - **On server for use by multiple applications**: If you do not include the adapter files in a module, you must install them as a stand-alone adapter on each application server where you want to run the module. Use a stand-alone adapter when multiple modules can use the same version of the adapter and you want to administer the adapter in a central location. A stand-alone adapter can also reduce the resources required by running a single adapter instance for multiple modules.

4. In Connection Properties, review and if necessary, change the values of the required connection properties. The fields are initialized with the connection information you specified when you started the wizard.

    - In the **CMIS server URL** field, type the URL to connect to the CMIS end point in the following format `http://<hostname>:<portnumber>/<contextroot>`. For eg: `http://cmisserv1.ibm.com:9080/p8cmis`

    - In the **Repository ID** field, enter the ID of the Content Management Repository created during configuration. For eg. `MYREPO`.

    - In the **Object service endpoint URL** field, you can update the URL for performing ID-based CRUD (Create, Retrieve, Update, Delete) operations on Objects in a Content Management Repository. The default content in this field is the CMIS server URL followed by **/ObjectService**.

      For example, `http://hostname/p8cmis/ObjectService`

    - In the **Navigation service endpoint URL** field, you can update the URL used to traverse the folder hierarchy in a Content Management Repository, and to locate Documents that are checked out. The default content in this field is the CMIS server URL followed by **/NavigationService**

      For example, `http://hostname/p8cmis/NavigationService`

    - In the **Failed event folder** field, enter the folder name designated for failed events during the FileNet Content Engine configuration. Example: `/FailedEvents`

    - In the **Subscriptions** field, enter the subscription details that was generated in the FileNet Content Engine, Example: `{377709E3-3078-4000-B16A-D3C0F72A4CD2}`.

5. Take your required action from the following options:

    - **Event polling configuration**

        - To specify the time interval between attempts to connect to the CMIS server if a connection fails, set **Time between retries in case of system connection failure (in milliseconds)** to a value in milliseconds.

        - To specify the number of connection exceptions during the inbound operation, set **Maximum number of retries in case of system connection failure** to a value greater than or equal to 0.

    - **Event delivery configuration**

- To specify the time interval between attempts to connect to the CMIS server if a connection fails, set **Time between retries in case of system connection failure (in milliseconds)** to a value in milliseconds.
- To specify the number of connection exceptions during the inbound operation, set **Maximum number of retries in case of system connection failure** to a value greater than or equal to 0. For more information, see "Managed (J2C) connection factory properties" on page 92.
- **Logging and tracing**
  a. If you have multiple instances of the adapter, enter a value in the **Adapter ID** that is unique for this instance.
  b. You can select the **Disguise user data as 'XXX' in log and trace files** check box to prevent sensitive user data from being written to log and trace files.
6. Click **Next**.

Results

The Specify the Location Properties window is displayed.

What to do next

Continue working in the wizard. The next step is to specify the location properties for artifacts.

Setting location properties for artifacts:

After you select and configure deployment properties, use the external service wizard to configure location properties that the adapter uses to generate the service.

Before you begin

Ensure that you have configured the business object.

About this task

To configure location properties for your module follow this procedure:

Procedure
1. In the Specify the Location Properties window, select an existing module or create a new one.
   - To use an existing module, select its name from the **Module** list.

     Important: If the module contains an interface or business object with the same name as that you are now configuring, the original interface or business object in the module is replaced by the new version.
   - To create a new module:
     a. Click **New**.
     b. In the Select a Business Integration Project Type window, select **Module** and click **Next**.
     c. In the Create a Module window, type a name for the module in the **Module name** field.

d. To retain the service description files (the `.import` and the `.wsdl` files) to be located in the default folder in the module, leave the **Use default location** check box selected. To specify a different folder in the module, clear the **Use default location** check box, and then click **Browse** to specify a different folder in the **Location** field.

e. To automatically open the module in the assembly diagram in WebSphere Integration Developer when the wizard closes, select the **Open the module assembly diagram** check box.

f. Click **Finish** to create the module.

Figure 33. Specifying the location properties

2. Specify the namespace you want to use for your inbound interface.
   - Select **Use the default namespace** check box to retain the inbound interface to use the default derived namespace. By default, this check box is selected.
   - To specify a different namespace, clear **Use the default namespace** check box and type a different value in the **Namespace** field.

3. Specify the folder in the new module where the service description is to be saved. In the **Folder** field, type the folder name or browse to an existing folder. If you do not specify a folder name, the artifacts (the import, XSD, and WSDL files) are stored in the root folder of the module (the folder with the module name).

4. In the **Name** field, accept the default import name or type a different name.

5. If you want to save business objects in a library where they can be used by other modules, select **Save business objects to a library** check box and specify the location of the library in the **Library** field.

6. In the **Description** field, type a descriptive comment about the module.

7. Click **Finish** to complete the setting of location properties.

   Note: If the Model Changed window is displayed, click **Yes**.

Results

The wizard exits. The artifacts are generated.

Chapter 4. Changing interaction specification properties using the assembly editor

To change interaction specification properties for your adapter module after generating the service, use the assembly editor in WebSphere Integration Developer.

Before you begin

You must have used the external service wizard to generate a service for the adapter.

About this task

You might want to change interaction specification properties after you have generated a service for the adapter. Interaction specification properties, which are optional, are set at the method level, for a specific operation on a specific business object. The values you specify appear as defaults in all parent business objects generated by the external service wizard. You can change these properties before you export the EAR file. You cannot change these properties after you deploy the application.

To change the interaction specification properties, use the following procedure.

Procedure

1. From the Business Integration perspective of WebSphere Integration Developer, expand the module name.
2. Expand **Assembly Diagram** and double-click the interface.
3. Click the interface in the assembly editor. (It shows the module properties if you do not do the extra click.)
4. Click the **Properties** tab. (You can also right-click the interface in the diagram and click **Show in Properties**)
5. Under **Binding**, click **Method bindings**. The methods for the interface are displayed, one for each combination of business object and operation.
6. Select the method whose interaction specification property you want to change.

Results

The interaction specification properties associated with your adapter module are changed.

What to do next

Deploy the module.

Chapter 5. Deploying the module

Deploy a module to place the files that make up your module and adapter into an operational environment for production or testing. In WebSphere Integration Developer, the integrated test environment features runtime support for WebSphere Process Server or WebSphere Enterprise Service Bus, or both, depending on the test environment profiles that you selected during installation.

Deployment environments

There are test and production environments into which you can deploy modules and adapters.

In WebSphere Integration Developer, you can deploy your modules to one or more servers in the test environment. This is typically the most common practice for running and testing business integration modules. However, you can also export modules for server deployment on WebSphere Process Server or WebSphere Enterprise Service Bus as EAR files using the administrative console or command-line tools.

Deploying the module for testing

In WebSphere Integration Developer, you can deploy a module that includes an embedded adapter to the test environment and work with server tools that enable you to perform such tasks as editing server configurations, starting, and stopping servers and testing the module code for errors. The testing is generally performed on the interface operations of your components, which enables you to determine whether the components are correctly implemented and the references are correctly wired.

Adding the module to the server

In WebSphere Integration Developer, you can add modules to one or more servers in the test environment.

Before you begin

If the module you are testing uses an adapter to perform inbound processing, generate and wire a *target component* to which the adapter sends the events.

About this task

In order to test your module and its use of the adapter, you need to add the module to the server.

Procedure

1. *Conditional:* If there are no servers in the **Servers** view, add and define a new server by performing the following steps:
   a. Place your cursor in the **Servers** view, right-click and select **New** → **Server**.
   b. From the Define a New Server window, select the server type.
   c. Configure server's settings.
   d. Click **Finish** to publish the server.

2. Add the module to the server.
   a. Switch to the servers view. In WebSphere Integration Developer, select
      Windows → **Show View** → **Servers**.
   a. Start the server. In the **Servers** tab in the lower-right pane of the WebSphere
      Integration Developer screen, right-click on the server, and then select **Start**.
3. When the server status is *Started*, right-click on the server, and select **Add and
   Remove Projects**.
4. In the Add and Remove Projects screen, select your project and click **Add**. The
   project moves from the **Available projects** list to the **Configured projects** list.
5. Click **Finish**. This deploys the module on the server.

   The Console tab in the lower-right pane displays a log while the module is
   being added to the server.

What to do next

Test the functionality of your module and the adapter.

Testing the module for outbound processing using the test client

Test the assembled module and adapter for outbound processing using the
WebSphere Integration Developer integration test client.

Before you begin

You need to add the module to the server first.

About this task

Testing a module is performed on the interface operations of your components,
which enables you to determine whether the components are correctly
implemented and the references are correctly wired.

Procedure

1. Select the module you want to test, right-click on it, and select **Test** → **Test
   Module**.
2. For information about testing a module using the test client, see the *Testing
   modules and components* topic in the WebSphere Integration Developer
   information center.

What to do next

If you are satisfied with the results of testing your module and adapter, you can
deploy the module and adapter to the production environment.

Deploying the module for production

Deploying a module created with the external service wizard to WebSphere Process
Server or WebSphere Enterprise Service Bus in a production environment is a
two-step process. First, you export the module in WebSphere Integration Developer
as an enterprise archive (EAR) file. Second, you deploy the EAR file using the
WebSphere Process Server or WebSphere Enterprise Service Bus administrative
console.

Installing the RAR file (for modules using stand-alone adapters only)

If you chose not to embed the adapter with your module, but instead choose to make the adapter available to all deployed applications in the server instance, you need to install the adapter in the form of a RAR file to the application server. A RAR file is a Java archive (JAR) file that is used to package a resource adapter for the Java 2 Connector (J2C) architecture.

Before you begin

You must set **Deploy connector project** to **On server for use by multiple adapters** in the Specify the Service Generation and Deployment Properties window of the external service wizard.

About this task

Installing the adapter in the form of a RAR file results in the adapter being available to all J2EE application components running in the server runtime.

Procedure

1. If the server is not running, right-click your server in the **Servers** view and select **Start**.
2. When the server status changes to **Started**, right-click the server and select **Administration** → **Run administrative console**.
3. Log on to the administrative console.
4. Click **Resources** → **Resource Adapters** → **Resource adapters**.
5. In the Resource adapters page, click **Install RAR**.
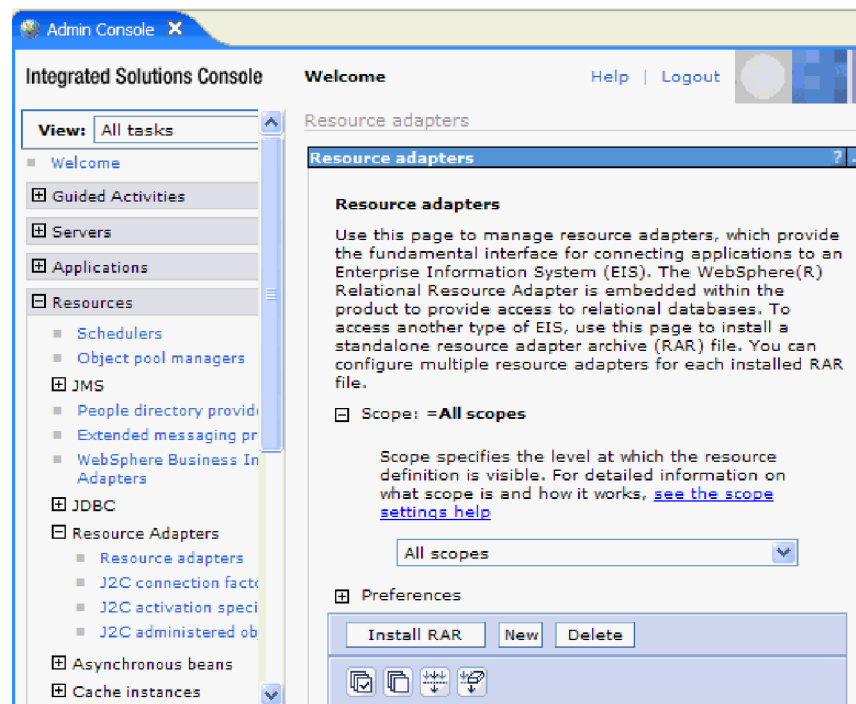
Figure 34. The Install RAR button on the Resource adapters page

6. In the Install RAR file page, click **Browse** and navigate to the RAR file for your adapter.

   The RAR files are typically installed in the following path: *WID_installation_directory*/ResourceAdapters/*adapter_name*/deploy/ *adapter*.rar

7. Click **Next**.

8. Optional: In the Resource adapters page, change the name of the adapter and add a description.

9. Click **OK**.

10. Click **Save** in the **Messages** box at the top of the page.

What to do next

The next step is to export the module as an EAR file that you can deploy on the server.

Exporting the module as an EAR file

Using WebSphere Integration Developer, export your module as an EAR file. By creating an EAR file, you capture all of the contents of your module in a format that can be easily deployed to WebSphere Process Server or WebSphere Enterprise Service Bus.

Before you begin

Before you can export a module as an EAR file, you must have created a module to communicate with your service. The module should be displayed in the WebSphere Integration Developer Business Integration perspective.

About this task

To export the module as an EAR file, perform the following procedure.

Procedure

1. Right-click the module and select **Export**.

2. In the Select window, expand **Java EE**.

3. Select **EAR file** and click **Next**.

4. Optional: Select the correct EAR application. The EAR application is named after your module, but with "App" added to the end of the name.

5. Browse for the folder on the local file system where the EAR file will be placed.

6. To export the source files, select the **Export source files** check box. This option is provided in case you want to export the source files in addition to the EAR file. Source files include files associated with Java components, data maps, and so on.

7. To overwrite an existing file, click **Overwrite existing file**.

8. Click **Finish**.

Results

The contents of the module are exported as an EAR file.

What to do next

Install the module in the administrative console. This deploys the module to WebSphere Process Server or WebSphere Enterprise Service Bus.

Installing the EAR file

Installing the EAR file is the last step of the deployment process. When you install the EAR file on the server and run it, the adapter, which is embedded as part of the EAR file, runs as part of the installed application.

Before you begin

You must have exported your module as an EAR file before you can install it on WebSphere Process Server or WebSphere Enterprise Service Bus.

About this task

To install the EAR file, perform the following procedure. For more information on clustering adapter module applications, see the http://www.ibm.com/software/webservers/appserv/was/library/.

Procedure

1. If the server is not running, right-click your server in the **Servers** view and select **Start**.
2. When the server status changes to **Started**, right-click the server and select **Administration** → **Run administrative console**.
3. Log on to the administrative console.
4. Click **Applications** → **New Application** → **New Enterprise Application**.

Figure 35. Preparing for the application installation window

5. Click **Browse** to locate your EAR file and click **Next**. The EAR file name is the name of the module followed by "App."

6. Optional: If you are deploying to a clustered environment, complete the following steps.

   a. On the **Step 2: Map modules to servers** window, select the module and click **Next**.

   b. Select the name of the server cluster.

   c. Click **Apply**.

7. Click **Next**. In the Summary page, verify the settings and click **Finish**.

8. Optional: If you are using an authentication alias, complete the following steps:

   a. Expand **Security** and select **Business Integration Security**.

   b. Select the authentication alias that you want to configure. You must have administrator or operator authority to make changes to authentication alias configurations.

   c. Optional: If it is not already filled in, type the **User name**.

   d. If it is not already filled in, type the **Password**.

   e. If it is not already filled in, type the password again in the **Confirm Password** field.

   f. Click **OK**.

Results

The project is now deployed and the Enterprise Applications window is displayed.

What to do next

If you want to set or reset any properties or you would like to cluster adapter project applications, make those changes using the administrative console before configuring troubleshooting tools.

Chapter 6. Administering the adapter module

When you are running the adapter in a stand-alone deployment, use the administrative console of the server to start, stop, monitor, and troubleshoot the adapter module. In an application that uses an embedded adapter, the adapter module starts or stops when the application is started or stopped.

Changing configuration properties for embedded adapters

To change configuration properties after you deploy the adapter as part of a module, you use the administrative console of the runtime environment.

Setting resource adapter properties for embedded adapters

To set resource adapter properties for your adapter after it has been deployed as part of a module, use the administrative console. You select the name of the property you want to configure and then change or set the value.

Before you begin

Your adapter module must be deployed on WebSphere Process Server or WebSphere Enterprise Service Bus.

About this task

Custom properties are default configuration properties shared by all WebSphere adapters.

To configure properties using the administrative console, use the following procedure.

Procedure

1. If the server is not running, right-click your server in the **Servers** view and select **Start**.
2. When the server status changes to **Started**, right-click the server and select **Administration** ⟩ **Run administrative console**.
3. Log on to the administrative console.
4. Select **Applications** ⟩ **Application Types** ⟩ **WebSphere enterprise application**.
5. From the Enterprise Applications list, click the name of the adapter module whose properties you want to change. The **Configuration** page is displayed.

Figure 36. The Manage Modules selection in the Configuration tab

6. Under **Modules**, click **Manage Modules**.
7. Click **IBM WebSphere Adapter for Enterprise Content Management**.
8. From the **Additional Properties** list, click **Resource Adapter**.
9. On the next page, from the **Additional Properties** list, click **Custom properties**.
10. For each property you want to change, perform the following steps.

    Note: See "Resource adapter properties" on page 90 for more information about these properties.

    a. Click the name of the property. The **Configuration** page for the selected property is displayed.
    b. Change the contents of the **Value** field or type a value, if the field is empty.
    c. Click **OK**.
11. In the Messages area, click **Save**.

Results

The resource adapter properties associated with your adapter module are changed.

Setting managed (J2C) connection factory properties for embedded adapters

To set managed connection factory properties for your adapter after it has been deployed as part of a module, use the administrative console. You select the name of the property you want to configure and then change or set the value.

Before you begin

Your adapter module must be deployed on WebSphere Process Server or WebSphere Enterprise Service Bus.

About this task

You use managed connection factory properties to configure the target CMIS server instance.

Note: In the administrative console, the properties are referred to as "J2C connection factory properties."

To configure properties using the administrative console, use the following procedure.

Procedure

1. If the server is not running, right-click your server in the **Servers** view and select **Start**.
2. When the server status changes to **Started**, right-click the server and select **Administration** ⟶ **Run administrative console**.
3. Log on to the administrative console.
4. Select **Applications** ⟶ **Application Types** ⟶ **WebSphere enterprise application**.
5. In the Enterprise Applications list, click the name of the adapter module whose properties you want to change.
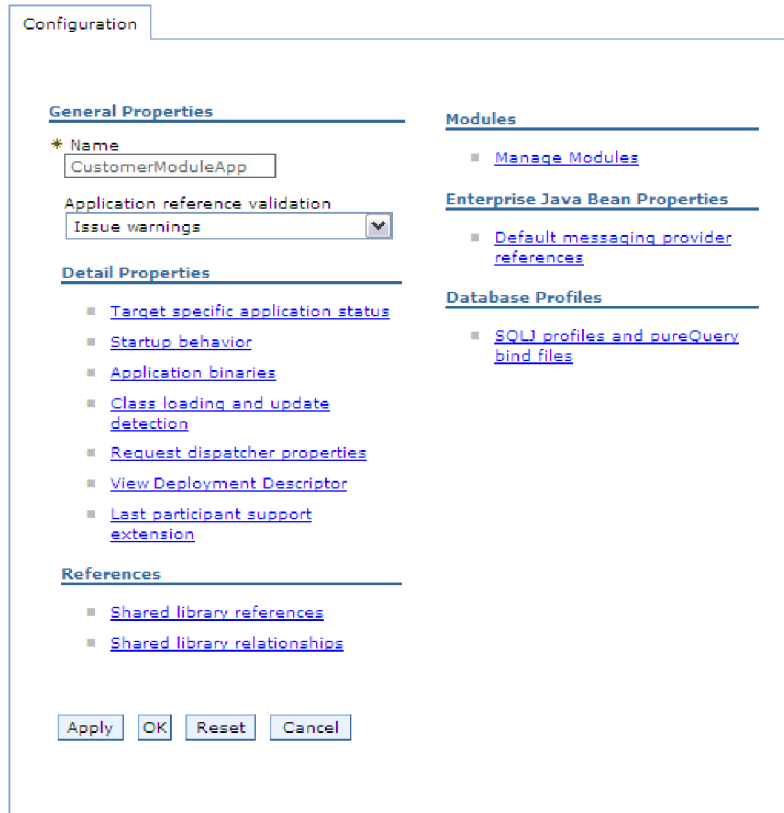
Figure 37. The Manage Modules selection in the Configuration tab

6. Under **Modules**, click **Manage Modules**.
7. Click **IBM WebSphere Adapter for Enterprise Content Management**.
8. In the **Additional Properties** list, click **Resource Adapter**.
9. On the next page, from the **Additional Properties** list, click **J2C connection factories**.
10. Click the name of the connection factory associated with your adapter module.
11. In the **Additional Properties** list, click **Custom properties**.

   Custom properties are those J2C connection factory properties that are unique to Adapter for Enterprise Content Management. Connection pool and advanced connection factory properties are properties you configure if you are developing your own adapter.
12. For each property you want to change, perform the following steps.

   Note: See "Managed (J2C) connection factory properties" on page 92 for more information about these properties.
   a. Click the name of the property.
   b. Change the contents of the **Value** field or type a value, if the field is empty.
   c. Click **OK**.
13. In the Messages area, click **Save**.

Results

The managed connection factory properties associated with your adapter module are changed.

Setting activation specification properties for embedded adapters

To set activation specification properties for your adapter after it has been deployed as part of a module, use the administrative console. You select the name of the message endpoint property you want to configure, and then change or set the value.

Before you begin

Your adapter module must be deployed on WebSphere Process Server or WebSphere Enterprise Service Bus.

About this task

You use activation specification properties to configure the endpoint for inbound processing.

To configure properties using the administrative console, use the following procedure.

Procedure

1. If the server is not running, right-click your server in the **Servers** view and select **Start**.
2. When the server status changes to **Started**, right-click the server and select **Administration ‣ Run administrative console**.
3. Log on to the administrative console.
4. Select **Applications ‣ Application Types ‣ WebSphere enterprise application**.
5. From the Enterprise Applications list, click the name of the adapter module whose properties you want to change.
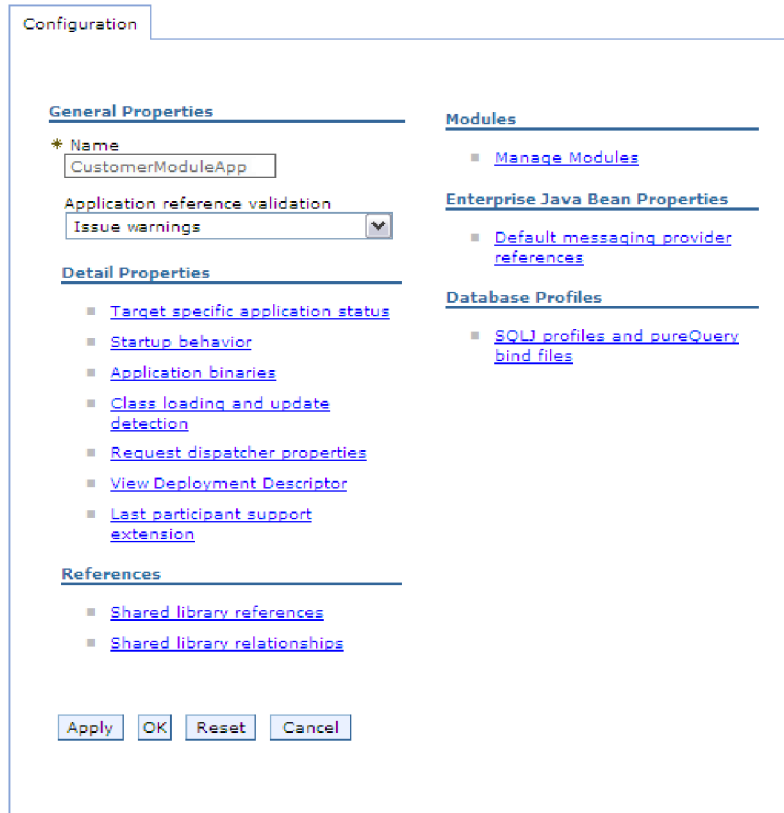
Figure 38. The Manage Modules selection in the Configuration tab

6. Under **Modules**, click **Manage Modules**.
7. Click **IBM WebSphere Adapter for Enterprise Content Management**.
8. From the **Additional Properties** list, click **Resource Adapter**.
9. On the next page, from the **Additional Properties** list, click **J2C activation specifications**.
10. Click the name of the activation specification associated with the adapter module.
11. From the **Additional Properties** list, click **J2C activation specification custom properties**.
12. For each property you want to change, perform the following steps.
    a. Click the name of the property.
    b. Change the contents of the **Value** field or type a value, if the field is empty.
    c. Click **OK**.
13. In the Messages area, click **Save**.

Results

The activation specification properties associated with your adapter module are changed.

Changing configuration properties for stand-alone adapters

To set configuration properties after you install a stand-alone adapter, you use the administrative console of the runtime environment. You provide general information about the adapter and then set resource adapter properties (which are used for general adapter operation). If the adapter is used for outbound operations, you create a connection factory and then set properties for it.

Setting resource adapter properties for stand-alone adapters

To set resource adapter properties for your stand-alone adapter after it has been installed on WebSphere Process Server or WebSphere Enterprise Service Bus, use the administrative console. You select the name of the property you want to configure and then change or set the value.

Before you begin

Your adapter must be installed on WebSphere Process Server or WebSphere Enterprise Service Bus.

About this task

Custom properties are default configuration properties shared by all WebSphere adapters.

To configure properties using the administrative console, use the following procedure.

Procedure

1. If the server is not running, right-click your server in the **Servers** view and select **Start**.
2. When the server status changes to **Started**, right-click the server and select **Administration** → **Run administrative console**.
3. Log on to the administrative console.
4. Click **Resources** → **Resource Adapters** → **Resource adapters**.
5. In the Resource adapters page, click **IBM WebSphere Adapter for Enterprise Content Management**.
6. In the **Additional Properties** list, click **Custom properties**.
7. For each property you want to change, perform the following steps.

   Note: See "Resource adapter properties" on page 90 for more information about these properties.
   a. Click the name of the property.
   b. Change the contents of the **Value** field or type a value, if the field is empty.
   c. Click **OK**.
8. In the Messages area, click **Save**.

Results

The resource adapter properties associated with your adapter are changed.

Setting managed (J2C) connection factory properties for stand-alone adapters

To set managed connection factory properties for your stand-alone adapter after it has been installed on WebSphere Process Server or WebSphere Enterprise Service Bus, use the administrative console. You select the name of the property you want to configure and then change or set the value.

Before you begin

Your adapter must be installed on WebSphere Process Server or WebSphere Enterprise Service Bus.

About this task

You use managed connection factory properties to configure the target CMIS server instance.

Note: In the administrative console, the properties are referred to as "J2C connection factory properties."

To configure properties using the administrative console, use the following procedure.

Procedure

1. If the server is not running, right-click your server in the **Servers** view and select **Start**.
2. When the server status changes to **Started**, right-click the server and select **Administration** ⟶ **Run administrative console**.
3. Log on to the administrative console.
4. Click **Resources** ⟶ **Resource Adapters** ⟶ **Resource adapters**.
5. In the Resource adapters page, click **IBM WebSphere Adapter for Enterprise Content Management**.
6. In the **Additional Properties** list, click **J2C connection factories**.
7. If you are going to use an existing connection factory, skip ahead to select from the list of existing connection factories.

   Note: If you have selected **Specify connection properties** when you used the external service wizard to configure the adapter module, you do not need to create a connection factory.

   If you are creating a connection factory, perform the following steps:
   a. Click **New**.
   b. In the **General Properties** section of the **Configuration** tab, type a name for the connection factory. For example, you can type `AdapterCF`.
   c. Type a value for **JNDI name**. For example, you can type `com/eis/AdapterCF`.
   d. Optional: Select an authentication alias from the **Component-managed authentication alias** list.
   e. Click **OK**.
   f. In the Messages area, click **Save**.

      The newly created connection factory is displayed.
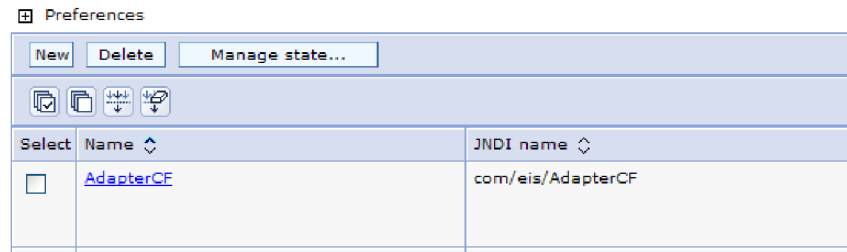
Figure 39. User defined connection factories for use with the resource adapter

8. In the list of connection factories, click the one you want to use.

9. In the **Additional Properties** list, click **Custom properties**.

   Custom properties are those J2C connection factory properties that are unique to Adapter for Enterprise Content Management. Connection pool and advanced connection factory properties are properties you configure if you are developing your own adapter.

10. For each property you want to change, perform the following steps.

    Note: See "Managed (J2C) connection factory properties" on page 92 for more information about these properties.

    a. Click the name of the property.

    b. Change the contents of the **Value** field or type a value, if the field is empty.

    c. Click **OK**.

11. After you have finished setting properties, click **Apply**.

12. In the Messages area, click **Save**.

Results

The managed connection factory properties associated with your adapter are set.

Setting activation specification properties for stand-alone adapters

To set activation specification properties for your stand-alone adapter after it has been installed on WebSphere Process Server or WebSphere Enterprise Service Bus, use the administrative console. You select the name of the message endpoint property you want to configure, and then change or set the value.

Before you begin

Your adapter must be installed on WebSphere Process Server or WebSphere Enterprise Service Bus.

About this task

You use activation specification properties to configure the endpoint for inbound processing.

To configure properties using the administrative console, use the following procedure.

Procedure

1. If the server is not running, right-click your server in the **Servers** view and select **Start**.
2. When the server status changes to **Started**, right-click the server and select **Administration** → **Run administrative console**.
3. Log on to the administrative console.
4. Click **Resources** → **Resource Adapters** → **Resource adapters**.
5. In the Resource adapters page, click **IBM WebSphere Adapter for Enterprise Content Management**.
6. In the **Additional Properties** list, click **J2C activation specifications**.
7. If you are going to use an existing activation specification, skip ahead to select from an existing list of activation specifications.

   Note: If you have selected **Use predefined connection properties** when you used the external service wizard to configure the adapter module, you do not need to create an activation specification.

   If you are creating an activation specification, perform the following steps:

   a. Click **New**.
   b. In the **General Properties** section of the **Configuration** tab, type a name for the activation specification. For example, you can type `AdapterAS`.
   c. Type a value for **JNDI name**. For example, you can type `com/eis/AdapterAS`.
   d. Optional: Select an authentication alias from the **Authentication alias** list.
   e. Select a message listener type.
   f. Click **OK**.
   g. Click **Save** in the **Messages** box at the top of the page.
      The newly created activation specification is displayed.

8. In the list of activation specifications, click the one you want to use.
9. In the Additional Properties list, click **J2C activation specification custom properties**.
10. For each property you want to set, perform the following steps.
    a. Click the name of the property.
    b. Change the contents of the **Value** field or type a value, if the field is empty.
    c. Click **OK**.
11. After you have finished setting properties, click **Apply**.
12. In the Messages area, click **Save**.

Results

The activation specification properties associated with your adapter are set.

Starting the application that uses the adapter

Use the administrative console of the server to start an application that uses the adapter. By default, the application starts automatically when the server starts.

About this task

Use this procedure to start the application, whether it is using an embedded or a stand-alone adapter. For an application that uses an embedded adapter, the adapter starts when the application starts. For an application that uses a stand-alone adapter, the adapter starts when the application server starts.

Procedure

1. If the server is not running, right-click your server in the **Servers** view and select **Start**.
2. When the server status changes to **Started**, right-click the server and select **Administration** → **Run administrative console**.
3. Log on to the administrative console.
4. Click **Applications** → **Application Types** → **WebSphere enterprise applications**.

   Note: The administrative console is labeled "Integrated Solutions Console".
5. Select the application that you want to start. The application name is the name of the EAR file you installed, without the .EAR file extension.
6. Click **Start**.

Results

The status of the application changes to Started, and a message stating that the application has started displays at the top of the administrative console.

Stopping the application that uses the adapter

Use the administrative console of the server to stop an application that uses the adapter. By default, the application stops automatically when the server stops.

About this task

Use this procedure to stop the application, whether it is using an embedded or a stand-alone adapter. For an application with an embedded adapter, the adapter stops when the application stops. For an application that uses a stand-alone adapter, the adapter stops when the application server stops.

Procedure

1. If the server is not running, right-click your server in the **Servers** view and select **Start**.
2. When the server status changes to **Started**, right-click the server and select **Administration** → **Run administrative console**.
3. Log on to the administrative console.
4. Click **Applications** → **Application Types** → **WebSphere enterprise applications**.

   Note: The administrative console is labeled "Integrated Solutions Console".
5. Select the application that you want to stop. The application name is the name of the EAR file you installed, without the .EAR file extension.
6. Click **Stop**.

Results

The status of the application changes to Stopped, and a message stating that the application has stopped displays at the top of the administrative console.

Monitoring performance using Performance Monitoring Infrastructure

Performance Monitoring Infrastructure (PMI) is a feature of the administrative console that allows you to dynamically monitor the performance of components in the production environment, including the adapter for Enterprise Content Management. PMI collects adapter performance data, such as average response time and total number of requests, from various components in the server and organizes the data into a tree structure. You can view the data through the Tivoli® Performance Viewer, a graphical monitoring tool that is integrated with the administrative console in WebSphere Process Server or WebSphere Enterprise Service Bus.

About this task

Before you can enable and configure PMI for your adapter, you must first set the level of tracing detail and run some events from which to gather performance data.

To learn more about how PMI can help you monitor and improve the overall performance of your adapter environment, search for PMI on the WebSphere Process Server or WebSphere Enterprise Service Bus web site: http://www.ibm.com/software/webservers/appserv/was/library/.

Configuring Performance Monitoring Infrastructure

You can configure Performance Monitoring Infrastructure (PMI) to gather adapter performance data, such as average response time and total number of requests. After you configure PMI for your adapter, you can monitor the adapter performance using Tivoli Performance viewer.

Before you begin

Before you can configure PMI for your adapter, you must first set the level of tracing detail and run some events from which to gather performance data.

1. To enable tracing and to receive event data, the trace level must be set to either fine, finer, finest, or all. After *=info, add a colon and a string, for example:

   ```
   *=info: WBILocationMonitor.CEI.ResourceAdapter.
   *=finest: WBILocationMonitor.LOG.ResourceAdapter.*=finest:
   ```

   For instructions on setting the trace level, refer to "Enabling tracing with the Common Event Infrastructure (CEI)" on page 79.
2. Generate at least one outbound request to produce performance data that you can configure.

Procedure

1. Enable PMI for your adapter.
   a. In the administrative console, expand **Monitoring and Tuning**, and then select **Performance Monitoring Infrastructure (PMI)**.
   b. From the list of servers, click the name of your server.
   c. Select the Configuration tab, and then select the **Enable Performance Monitoring (PMI)** check box.

d. Select **Custom** to selectively enable or disable statistics.
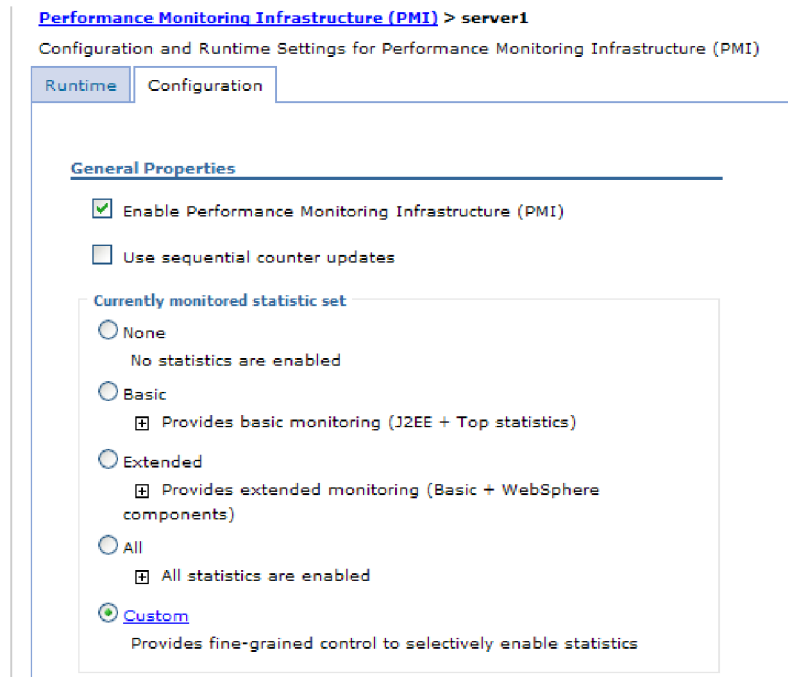
Figure 40. Enabling Performance Monitoring Infrastructure

   e. Click **Apply** or **OK**.
   f. Click **Save**. PMI is now enabled.
2. Configure PMI for your adapter.
   a. In the administrative console, expand **Monitoring and Tuning**, and then select **Performance Monitoring Infrastructure (PMI)**.
   b. From the list of servers, click the name of your server.
   c. Select **Custom**.
   d. Select the **Runtime** tab. The following figure shows the Runtime tab.
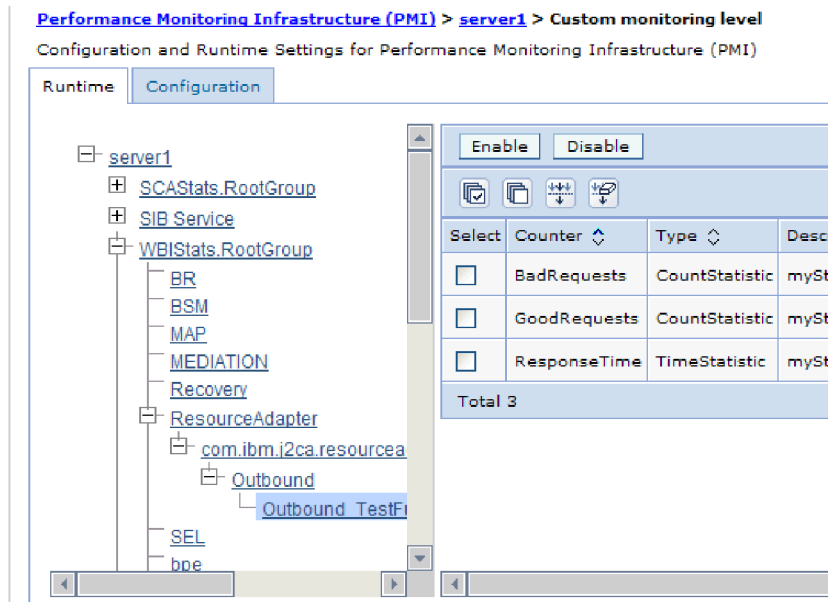
Figure 41. Runtime tab used for configuring PMI

e. Click **WBIStats.RootGroup**. This is a PMI sub module for data collected in the root group. This example uses the name WBIStats for the root group.

f. Click **ResourceAdapter**. This is a sub module for the data collected for the JCA adapters.

g. Click the name of your adapter, and select the processes you want to monitor.

h. In the right pane, select the check boxes for the statistics you want to gather, and then click **Enable**.

Results

PMI is configured for your adapter.

What to do next

Now you can view the performance statistics for your adapter.

Viewing performance statistics

You can view adapter performance data through the graphical monitoring tool, Tivoli Performance Viewer. Tivoli Performance Viewer is integrated with the administrative console in WebSphere Process Server or WebSphere Enterprise Service Bus.

Before you begin

Configure Performance Monitoring Infrastructure for your adapter.

Procedure

1. In the administrative console, expand **Monitoring and Tuning**, expand **Performance Viewer**, then select **Current Activity**.
2. In the list of servers, click the name of your server.
3. Under your server name, expand **Performance Modules**.

4. Click **WBIStatsRootGroup**.
5. Click **ResourceAdapter** and the name of your adapter module.
6. If there is more than one process, select the check boxes for the processes whose statistics you want to view.

Results

The statistics are displayed in the right panel. You can click **View Graph** to view a graph of the data, or **View Table** to see the statistics in a table format.

The following figure shows adapter performance statistics.
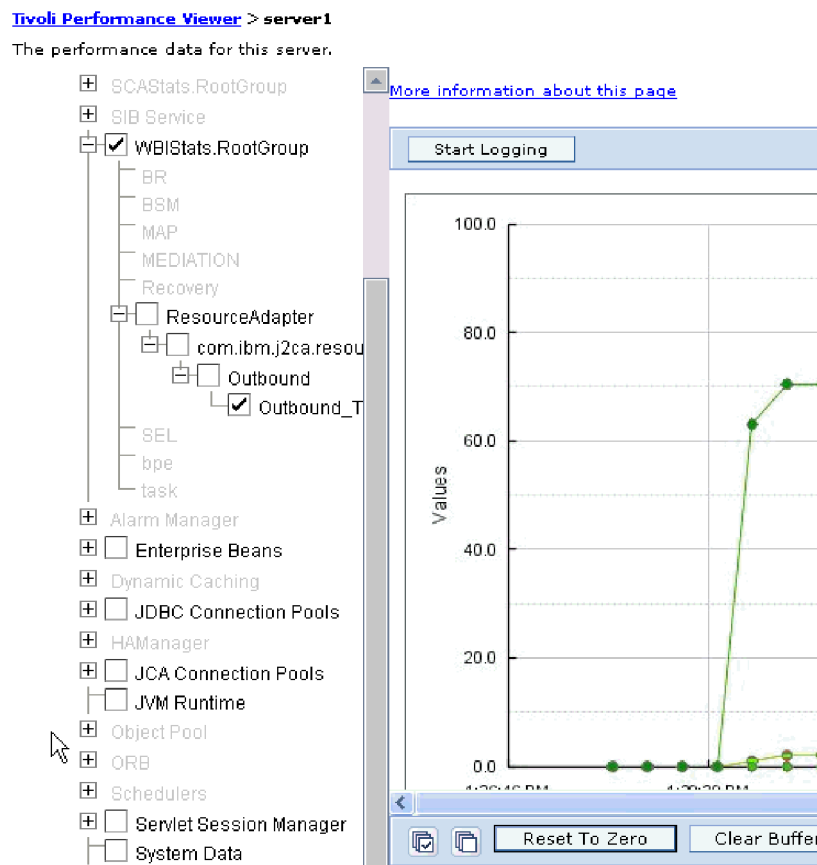
Figure 42. Adapter performance statistics, using graph view

Enabling tracing with the Common Event Infrastructure (CEI)

The adapter can use the Common Event Infrastructure, a component embedded in the server, to report data about critical business events such as the starting or stopping of a poll cycle. Event data can be written to a database or a trace log file depending on configuration settings.

About this task

Use this procedure to report CEI entries in the trace log file by using the Common Base Event Browser within the administrative console.

Procedure

1. In the administrative console, click **Troubleshooting**.
2. Click **Logs and Trace**.
3. From the list of servers, click the name of your server.
4. In the **Change Log Detail Levels** box, click the name of the CEI database (for example, WBIEventMonitor.CEI.ResourceAdapter.*) or the trace log file (for example, WBIEventMonitor.LOG.ResourceAdapter.*) to which you want the adapter to write event data.
5. Select the level of detail about business events that you want the adapter to write to the database or trace log file, and (optionally) adjust the granularity of detail associated with messages and traces.
   - **No Logging**. Turns off event logging.
   - **Messages Only**. The adapter reports an event.
   - **All Messages and Traces**. The adapter reports details about an event.
   - **Message and Trace Levels**. Settings for controlling the degree of detail the adapter reports about the business object payload associated with an event. If you want to adjust the detail level, select one of the following options:

     Fine. The adapter reports the event but none of the business object payload.

     Finer. The adapter reports the event and the business object payload description.

     Finest. The adapter reports the event and the entire business object payload.
6. Click **OK**.

Results

Event logging is enabled. You can view CEI entries in the trace log file or by using the Common Base Event Browser within the administrative console.

Chapter 7. Troubleshooting and support

Common troubleshooting techniques and self-help information help you identify and solve problems quickly.

Configuring logging and tracing

Configure logging and tracing to suit your requirements. Enable logging for the adapter to control the status of event processing. Change the adapter log and trace file names to separate them from other log and trace files.

Configuring logging properties

Use the administrative console to enable logging and to set the output properties for a log, including the location, level of detail, and output format of the log.

About this task

Before the adapters can log monitored events, you must specify the service component event points that you want to monitor, what level of detail you require for each event, and format of the output used to publish the events to the logs. Use the administrative console to perform the following tasks:

- Enable or disable a particular event log
- Specify the level of detail in a log
- Specify where log files are stored and how many log files are kept
- Specify the format for log output

  If you set the output for log analyzer format, you can open trace output using the Log Analyzer tool, which is an application included with your process server. This is useful if you are trying to correlate traces from two different server processes, because it allows you to use the merge capability of the Log Analyzer.

For more information about monitoring on a process server, including service components and event points, see the documentation for your process server.

You can change the log configuration statically or dynamically. Static configuration takes effect when you start or restart the application server. Dynamic, or run time, configuration changes apply immediately.

When a log is created, the detail level for that log is set from the configuration data. If no configuration data is available for a particular log name, the level for that log is obtained from the parent of the log. If no configuration data exists for the parent log, the parent of that log is checked, and so on, up the tree, until a log with a non-null level value is found. When you change the level of a log, the change is propagated to the children of the log, which recursively propagate the change to their children, as necessary.

To enable logging and set the output properties for a log, use the following procedure.

Procedure

1. In the navigation pane of the administrative console, click **Servers** → **Application Servers**.
2. Click the name of the server that you want to work with.
3. Under **Troubleshooting**, click **Logs and trace**.
4. Click **Change Log Detail Levels**.
5. Specify when you want the change to take effect:
   - For a static change to the configuration, click the **Configuration** tab.
   - For a dynamic change to the configuration, click the **Runtime** tab.
6. Click the names of the packages whose logging level you want to modify. The package names for WebSphere Adapters start with **com.ibm.j2ca.***:
   - For the adapter base component, select **com.ibm.j2ca.base.***.
   - For the adapter base component and all deployed adapters, select **com.ibm.j2ca.***.
   - For the Adapter for Enterprise Content Management only, select the **com.ibm.j2ca.ecm.*** package.
7. Select the logging level.

Logging Level	Description
Fatal	The task cannot continue or the component cannot function.
Severe	The task cannot continue, but the component can still function. This logging level also includes conditions that indicate an impending fatal error, that is, situations that strongly suggest that resources are on the verge of being depleted.
Warning	A potential error has occurred or a severe error is impending. This logging level also includes conditions that indicate a progressive failure, for example, the potential leaking of resources.
Audit	A significant event has occurred that affects the server state or resources.
Info	The task is running. This logging level includes general information outlining the overall progress of a task.
Config	The status of a configuration is reported or a configuration change has occurred.
Detail	The subtask is running. This logging level includes general information detailing the progress of a subtask.

8. Click **Apply**.
9. Click **OK**.
10. To have static configuration changes take effect, stop and then restart the process server.

Results

Log entries from this point forward contain the specified level of information for the selected adapter components.

Changing the log and trace file names

To keep the adapter log and trace information separate from other processes, use the administrative console to change the file names. By default, log and trace information for all processes and applications on a process server is written to the SystemOut.log and trace.log files.

Before you begin

You can change the log and trace file names at any time after the adapter module has been deployed to an application server.

About this task

You can change the log and trace file names statically or dynamically. Static changes take effect when you start or restart the application server. Dynamic or run time changes apply immediately.

Log and trace files are in the *install_root*/profiles/*profile_name*/logs/ *server_name* folder.

To set or change the log and trace file names, use the following procedure.

Procedure

1. In the navigation pane of the administrative console, select **Applications > Enterprise Applications**.
2. In the Enterprise Applications list, click the name of the adapter application. This is the name of the EAR file for the adapter, but without the ear file extension. For example, if the EAR file is named Accounting_OutboundApp.ear, then click **Accounting_OutboundApp**.
3. In the Configuration tab, in the Modules list, click **Manage Modules**.
4. In the list of modules, click IBM WebSphere Adapter for Enterprise Content Management.
5. In the Configuration tab, under Additional Properties, click **Resource Adapter**.
6. In the Configuration tab, under Additional Properties, click **Custom properties**.
7. In the Custom Properties table, change the file names.
   a. Click either **logFilename** to change the name of the log file or **traceFilename** to change the name of the trace file.
   b. In the Configuration tab, type the new name in the **Value** field. By default, the log file is called SystemOut.log and the trace file is called trace.log.
   c. Click **Apply** or **OK**. Your changes are saved on your local machine.
   d. To save your changes to the master configuration on the server, use one of the following procedures:
      - **Static change**: Stop and restart the server. This method allows you to make changes, but those changes do not take effect until you stop and start the server.
      - **Dynamic change**: Click the **Save** link in the Messages box above the Custom properties table. Click **Save** again when prompted.

First-failure data capture (FFDC) support

The adapter supports first-failure data capture (FFDC), which provides persistent records of failures and significant software incidents that occur during run time in WebSphere Process Server or WebSphere Enterprise Service Bus.

The FFDC feature runs in the background and collects events and errors that occur at run time. The feature provides a means for associating failures to one another, allowing software to link the effects of a failure to their causes, and thereby facilitate the quick location of the root cause of a failure. The data that is captured can be used to identify exception processing that occurred during the adapter run time.

When a problem occurs, the adapter writes exception messages and context data to a log file, which is located in the *install_root*/profiles/*profile*/logs/ffdc directory.

For more information about first-failure data capture (FFDC), see the WebSphere Process Server or WebSphere Enterprise Service Bus documentation.

Resolving file processing error

Problem: During Inbound processing, if the Event Subscription folder has any documents created by the user, the Adapter will not process these files.

If there are documents in the Event Subscription folder when the adapter begins to look for events, these documents will be skipped and will not be processed. Due to the presence of these documents, the number of events processed by the Adapter in each poll cycle will be less than the value in the PollQuantity property.

If the number of documents created by user exceeds the value of the PollQuantity property, the Adapter will not pick up any files.

Workaround: This issue can be resolved in the following manner
- by increasing the value of the PollQuantity property to a larger value
- by moving the documents created by the user, from the subscription folder.

Note: It is advisable not to create any user documents in Event Subscription folder in the CMIS server.

Self-help resources

Use the resources of IBM software support to get the most current support information, obtain technical documentation, download support tools and fixes, and avoid problems with WebSphere Adapters. The self-help resources also help you diagnose problems with the adapter and provide information about how to contact IBM software support.

Support Web site

The WebSphere Adapters software support Web site at http://www.ibm.com/software/integration/wbiadapters/support/ provides links to many resources to help you learn about, use, and troubleshoot WebSphere Adapters, including:
- Flashes (alerts about the product)

- Technical information including the product information center, manuals, IBM Redbooks®, and whitepapers
- Educational offerings
- Technotes

Recommended fixes

A list of recommended fixes you must apply is available at the following location: http://www.ibm.com/support/docview.wss?fdoc=aimadp&rs=695 &uid=swg27010397

Technotes

Technotes provide the most current documentation about the Adapter for Enterprise Content Management, including the following topics:
- Problems and their currently available solutions
- Answers to frequently asked questions
- How to information about installing, configuring, using, and troubleshooting the adapter
- *IBM Software Support Handbook*

For a list of technotes for WebSphere Adapters, visit this address:

http://www.ibm.com/support/search.wss?tc=SSMKUK&rs=695&rank=8 &dc=DB520+D800+D900+DA900+DA800+DB560&dtm

Plug-in for IBM Support Assistant

Adapter for Enterprise Content Management provides a plug-in for IBM Support Assistant, which is a free, local software serviceability workbench. The plug-in supports the dynamic trace feature. For information about installing or using IBM Support Assistant, visit this address:

http://www.ibm.com/software/support/isa/

Chapter 8. Reference

Detailed information about business objects, adapter properties (enterprise service discovery properties, resource adapter properties, managed (J2C) connection factory properties, activation specification properties, and interaction specification properties), messages, and related product information is provided for your reference.

Configuration properties

WebSphere Adapter for Enterprise Content Management has several categories of configuration properties, which you set with the external service wizard while generating or creating objects and services. You can change the resource adapter, managed connection factory, and activation specification properties after you deploy the application to WebSphere Process Server or WebSphere Enterprise Service Bus.

Guide to information about properties

The properties used to configure WebSphere Adapter for Enterprise Content Management are described in detail in tables included in each of the configuration properties topics, such as Resource adapter properties, Managed connection factory properties, and so on. To help you use these tables, information about each row you might see is explained here.

The following table explains the meaning of each row that might be displayed in the table for a configuration property.

Row	Explanation
Required	A required field (property) must have a value in order for the adapter to work. Sometimes the external service wizard provides a default value for required properties.
	Removing a default value from a required field on the external service wizard *will not change that default value*. When a required field contains no value at all, the external service wizard processes the field using its assigned default value, and that default value is displayed on the administrative console.
	Possible values are **Yes** and **No**.
	Sometimes a property is required only when another property has a specific value. When this is the case, the table will note this dependency. For example,
	• Yes, when the EventQueryType property is set to Dynamic
	• Yes, for Oracle databases
Possible values	Lists and describes the possible values that you can select for the property.

Row	Explanation
Default	The predefined value that is set by the external service wizard. When the property is required, you must either accept the default value or specify one yourself. If a property has no default value, the table will state No default value. The word None is an acceptable default value, and does not mean that there is no default value.
Unit of measure	Specifies how the property is measured, for example in kilobytes or seconds.
Property type	Describes the property type. Valid property types include: • Boolean • String • Integer
Usage	Describes usage conditions or restrictions that might apply to the property. For instance, here is how a restriction would be documented: For Rational® Application Developer for WebSphere Software version 6.40 or earlier, the password: • Must be uppercase • Must be 8 characters in length For versions of Rational Application Developer for WebSphere Software later than 6.40, the password: • Is not case sensitive • Can be up to 40 characters in length. This section lists other properties that affect this property or the properties that are affected by this property and describes the nature of the conditional relationship.
Example	Provides sample property values, for example: "If Language is set to JA (Japanese), code page number is set to 8000".
Globalized	If a property is globalized, it has national language support, meaning that you can set the value in your national language. Valid values are **Yes** and **No**.
Bidi supported	Indicates whether the property is supported in bidirectional (bidi) processing. Bidirectional processing refers to the task of processing data that contains both right-to-left (Hebrew or Arabic, for example) and left-to-right (a URL or file path, for example) semantic content within the same file. Valid values are **Yes** and **No**.

Outbound configuration properties

WebSphere Adapter for Enterprise Content Management has several categories of outbound connection configuration properties, which you set with the external service wizard while generating or creating objects and services. You can change the resource adapter and managed connection factory properties after you deploy the module to WebSphere Process Server or WebSphere Enterprise Service Bus

using WebSphere Integration Developer or the administrative console, but connection properties for the external service wizard cannot be changed after deployment.

Connection properties for the wizard

External service connection properties are used to establish a connection between the external service wizard, a tool that is used to create business objects, and the CMIS server. These properties specify such things as connection configuration, bidirectional transformation properties, and logging options for the wizard. Once a connection is established, the wizard can discover in the CMIS server the metadata it needs to create business objects.

The following table lists and describes the connection properties. These properties can only be configured using the wizard and cannot be changed after deployment. A complete description of each property is provided in the sections that follow the table. For information about how to read the property details tables in the sections that follow, see "Guide to information about properties" on page 87.

Table 1. Connection properties for the external service wizard

Property name in the wizard	Description
"Endpoint address of the CMIS server"	The URL pointing to the CMIS server end-point.
"User name (UserName)"	The CMIS server user name.
"Password (Password)" on page 90	The password for the corresponding user name.
"Repository Service URL of the CMIS Server" on page 90	The URL pointing to the CMIS server Repository Service

Endpoint address of the CMIS server

This property specifies URL of the CMIS server end-point.

Table 2. Endpoint address of the CMIS server

Required	Yes
Default	No default value
Property type	String
Usage	Must be a valid URL
Example	http://cmisserver.com/p8apis
Globalized	No
Bidi supported	No

User name (UserName)

This property specifies the user name to connect to the CMIS server.

Table 3. user name to connect to the CMIS server

Required	Yes
Default	No default value
Property type	String
Usage	The user name to connect to the CMIS server. Typing an incorrect user name prevents the adapter from accessing the CMIS server.
Globalized	No

Table 3. user name to connect to the CMIS server (continued)

Bidi supported	No

Password (Password)

This property specifies the password for the CMIS server user name.

Table 4. Password details

Required	Yes
Default	No default value
Property type	String
Usage	The password for the CMIS server user name. Typing an incorrect password prevents the adapter from accessing the CMIS server.
Globalized	No
Bidi supported	No

Repository Service URL of the CMIS Server

This property specifies URL of the Repository Service of the CMIS server.

Table 5. URL of the Repository Service of the CMIS server

Required	Yes
Default	Endpoint Address of the CMIS Server + **/RepositoryService**
Property type	String
Usage	Must be a valid URL
Example	http://cmisserver.com/p8apis/RepositoryService
Globalized	No
Bidi supported	No

Resource adapter properties

The resource adapter properties control the general operation of the adapter, such as specifying the namespace for business objects. You set the resource adapter properties using the external service wizard when you configure the adapter. After deploying the adapter, use the administrative console to change these properties.

The following table lists the resource adapter properties and their purpose. A complete description of each property is provided in the sections that follow the table.

Table 6. Resource adapter properties for the Adapter for Enterprise Content Management

Name		
In the wizard	**In the administrative console**	**Description**
"Adapter ID" on page 91	adapterID	Identifies the adapter instance for PMI events and for logging and tracing.
"Disguise user data as "XXX" in log and trace files" on page 91	hideConfidentialTrace	Specifies whether to disguise potentially sensitive information by writing X strings instead of user data in the log and trace files.

Adapter ID

This property identifies a specific deployment, or instance, of the adapter.

Table 7. Adapter ID details

Required	Yes
Default	`001`
Property type	String
Usage	This property identifies the adapter instance in log and trace files, and also helps identify the adapter instance while monitoring adapters. The adapter ID is used with an adapter-specific identifier, `ECMRA`, to form the component name used by the Log and Trace Analyzer tool. For example, if the adapter ID property is set to `001`, the component ID is `ECMRA001`. If you run multiple instances of the same adapter, ensure that the first eight characters of the adapter ID property are unique for each instance so that you can correlate the log and trace information to a particular adapter instance. By making the first seven characters of an adapter ID property unique, the component ID for multiple instances of that adapter is also unique, allowing you to correlate the log and trace information to a particular instance of an adapter. For example, when you set the adapter ID property of two instances of WebSphere Adapter for Enterprise Content Management to `001` and `002`. The component IDs for those instances, `ECMRA001` and `ECMRA002`, are short enough to remain unique, enabling you to distinguish them as separate adapter instances. However, instances with longer adapter ID properties cannot be distinguished from each other. If you set the adapter ID properties of two instances to `Instance01` and `Instance02`, you cannot examine the log and trace information for each adapter instance because the component ID for both instances is truncated. For inbound processing, the value of this property is set at the resource adapter level. For outbound processing, the value can be set both at the resource adapter level and the managed connection factory level. After you use the external service wizard to configure the adapter for outbound processing, you can set the resource adapter and managed connection factory properties independently. If you use the WebSphere Integration Developer assembly editor or the administrative console to reset these properties, ensure that you set them consistently, to prevent inconsistent marking of the log and trace entries.
Globalized	Yes
Bidi supported	No

Disguise user data as "XXX" in log and trace files

This property specifies whether to replace user data in log and trace files with a string of X's to prevent unauthorized disclosure of potentially sensitive data.

Table 8. Disguise user data as "XXX" in log and trace files details

Required	No
Possible values	`True` `False`
Default	`False`

Table 8. Disguise user data as "XXX" in log and trace files details (continued)

Property type	Boolean
Usage	If you set this property to True, the adapter replaces user data with a string of X's when writing to log and trace files. For inbound processing, the value of this property is set at the resource adapter level. For outbound processing, the value can be set both at the resource adapter level and the managed connection factory level. After you use the external service wizard to configure the adapter for outbound processing, you can set the resource adapter and managed connection factory properties independently. If you use the WebSphere Integration Developer assembly editor or the administrative console to reset these properties, ensure that you set them consistently, to prevent inconsistent marking of the log and trace entries.
Globalized	No
Bidi supported	No

Managed (J2C) connection factory properties

Managed connection factory properties are used by the adapter at run time to create an outbound connection instance with the CMIS server.

You set the managed connection factory properties using the external service wizard and can change them using the WebSphere Integration Developer Assembly Editor, or after deployment through the WebSphere Process Server administrative console.

The following table lists the managed connection factory properties. A complete description of each property is provided in the sections that follow the table. For information about how to read the property details tables in the sections that follow, see Guide to understanding property details.

Note: The external service wizard refers to these properties as managed connection factory properties and the WebSphere Process Server administrative console refers to them as (J2C) connection factory properties.

Table 9. Managed connection factory properties

Property name		Description
In the wizard	**In the administrative console**	
"Adapter ID" on page 93	adapterID	Identifies the adapter instance for PMI events and for logging and tracing.
"Disguise user data as "XXX" in log and trace files" on page 94	hideConfidentialTrace	Specifies whether to disguise potentially sensitive information by writing X strings instead of user data in the log and trace files.
"Maximum Number of retries in case of system connection failure" on page 94	connectionRetryLimit	The adapter will try connecting to the Enterprise Information System (EIS) for a specified number of tries. Select only if you want to reduce the number of connection exceptions in the outbound operation. If selected, adapter will validate the connection for each outbound request.
"Time between retries in case of system connection failure (milliseconds)" on page 95	connectionRetryInterval	Specifies the time interval between attempts to restart the event listeners.

Table 9. Managed connection factory properties (continued)

Property name		Description
In the wizard	**In the administrative console**	
"Endpoint Address of the CMIS server" on page 95	contextRootEndpointAddress	Specifies the name or address of the server that hosts the CMIS server
"Navigation Service URL of the CMIS server" on page 95	navigationServiceEndpoint	Specifies the URL to locate the Navigation Service of the CMIS server.
"Object Service URL of the CMIS server" on page 96	objectServiceEndpoint	Specifies the URL to locate the Object Service of the CMIS server.
"Password" on page 96	password	Specifies the password of the user account of the adapter in the CMIS server.
"User name " on page 96	userName	Specifies the name of the user account of the adapter in the CMIS server.
"Versioning Service URL of the CMIS server" on page 97	versioningServiceEndpoint	Specifies the URL to locate the Versioning Service of the CMIS server

Adapter ID

This property identifies a specific deployment, or instance, of the adapter.

Table 10. Adapter ID details

Required	Yes
Default	001
Property type	String
Usage	This property identifies the adapter instance in log and trace files, and also helps identify the adapter instance while monitoring adapters. The adapter ID is used with an adapter-specific identifier, ECMRA, to form the component name used by the Log and Trace Analyzer tool. For example, if the adapter ID property is set to 001, the component ID is ECMRA001. If you run multiple instances of the same adapter, ensure that the first eight characters of the adapter ID property are unique for each instance so that you can correlate the log and trace information to a particular adapter instance. By making the first seven characters of an adapter ID property unique, the component ID for multiple instances of that adapter is also unique, allowing you to correlate the log and trace information to a particular instance of an adapter. For example, when you set the adapter ID property of two instances of WebSphere Adapter for Enterprise Content Management to 001 and 002. The component IDs for those instances, ECMRA001 and ECMRA002, are short enough to remain unique, enabling you to distinguish them as separate adapter instances. However, instances with longer adapter ID properties cannot be distinguished from each other. If you set the adapter ID properties of two instances to Instance01 and Instance02, you cannot examine the log and trace information for each adapter instance because the component ID for both instances is truncated. For inbound processing, the value of this property is set at the resource adapter level. For outbound processing, the value can be set both at the resource adapter level and the managed connection factory level. After you use the external service wizard to configure the adapter for outbound processing, you can set the resource adapter and managed connection factory properties independently. If you use the WebSphere Integration Developer assembly editor or the administrative console to reset these properties, ensure that you set them consistently, to prevent inconsistent marking of the log and trace entries.
Globalized	Yes
Bidi supported	No

Disguise user data as "XXX" in log and trace files

This property specifies whether to replace user data in log and trace files with a string of X's to prevent unauthorized disclosure of potentially sensitive data.

Table 11. Disguise user data as "XXX" in log and trace files details

Required	No
Possible values	True False
Default	False
Property type	Boolean
Usage	If you set this property to True, the adapter replaces user data with a string of X's when writing to log and trace files. For inbound processing, the value of this property is set at the resource adapter level. For outbound processing, the value can be set both at the resource adapter level and the managed connection factory level. After you use the external service wizard to configure the adapter for outbound processing, you can set the resource adapter and managed connection factory properties independently. If you use the WebSphere Integration Developer assembly editor or the administrative console to reset these properties, ensure that you set them consistently, to prevent inconsistent marking of the log and trace entries.
Globalized	No
Bidi supported	No

Maximum Number of retries in case of system connection failure

This property specifies the number of times the adapter attempts to create a connection to the Enterprise Information System (EIS). The adapter will try connecting to the EIS for the specified number of times. Select only if you want to reduce the number of connection exceptions in the outbound operation. If selected, the adapter will validate the connection for each outbound request.

Table 12. Reset Client details

Required	No
Possible values	Integers
Default	0
Property type	Integer
Usage	Only positive values are valid. When the adapter encounters an error related to the outbound connection, it retries to establish a physical connection (when physical connection is not established) for the number of times specified for this property with a time delay specified in the property "Time between retries in case of system connection failure (milliseconds)" on page 95. If the value is 0, the adapter does not perform any EIS connection validation and executes the outbound operation. if the value is > 0, then during each request the adapter validates if the EIS connection is active. • If the connection is valid the operation is completed. • if connection is invalid, the adapter invalidates the current managed connection and a new managed connection is created (new physical connection)
Globalized	No

Table 12. Reset Client details (continued)

Bidi supported	No

Time between retries in case of system connection failure (milliseconds)

This property specifies the time interval between attempts to connect to the Enterprise Information System (EIS).

Table 13. Time between retries in case of system connection failure details

Required	No
Possible Values	Positive Integers
Default	60000
Unit of measure	Milliseconds
Property type	Integer
Usage	When the adapter encounters an error related to the outbound connection, this property specifies the time interval that the adapter waits in between attempts to reestablish an outbound connection. It is disabled by default and is only enabled when the value of "Maximum Number of retries in case of system connection failure" on page 94 is greater than 0.
Globalized	No
Bidi supported	No

Endpoint Address of the CMIS server

This property specifies URL of the CMIS server end-point.

Table 14. Endpoint address details

Required	Yes
Default	No default value
Property type	String
Usage	Must be a valid URL
Example	`http://cmisserver.com/p8apis`
Globalized	No
Bidi supported	No

Navigation Service URL of the CMIS server

This property specifies URL of the Navigation Service of the CMIS server.

Table 15. URL of the Repository Service of the CMIS server

Required	Yes
Default	Endpoint Address of the CMIS Server + **/NavigationService**
Property type	String
Usage	Must be a valid URL
Example	http://cmisserver.com/p8apis/NavigationService
Globalized	No

Table 15. URL of the Repository Service of the CMIS server (continued)

Bidi supported	No

Object Service URL of the CMIS server

This property specifies URL of the Object Service of the CMIS server.

Table 16. URL of the Repository Service of the CMIS server

Required	Yes
Default	Endpoint Address of the CMIS Server + **/ObjectService**
Property type	String
Usage	Must be a valid URL
Example	http://cmisserver.com/p8apis/ObjectService
Globalized	No
Bidi supported	No

Password

This property specifies the password of the user account of the adapter on the CMIS server.

Table 17. Password details

Required	Yes
Default	No default value
Property type	String
Usage	The password for the CMIS server user name. Typing an incorrect password prevents the adapter from accessing the CMIS server.
Globalized	No
Bidi supported	No

User name

This property specifies the user name to connect to the CMIS server.

Table 18. User name details

Required	Yes
Default	No default value
Property type	String
Usage	The user name for connecting to the CMIS server. Typing an incorrect user name prevents the adapter from accessing the CMIS server.
Globalized	No
Bidi supported	No

Versioning Service URL of the CMIS server

This property specifies URL of the Versioning Service of the CMIS server.

Table 19. URL of the Repository Service of the CMIS server

Required	Yes
Default	Endpoint Address of the CMIS Server + **/VersioningService**
Property type	String
Usage	Must be a valid URL
Example	http://cmisserver.com/p8apis/VersioningService
Globalized	No
Bidi supported	No

Interaction specification properties

Interaction specification, or InteractionSpec, properties control the interaction for an operation. The external service wizard sets the interaction specification properties when you configure the adapter. Typically, you do not need to change these properties. However, some properties for outbound operations can be changed by the user. For example, you might increase the value of the interaction specification property that specifies the maximum number of records to be returned by a RetrieveAll operation, if your RetrieveAll operations do not return complete information. To change these properties after the application is deployed, use the assembly editor in WebSphere Integration Developer. The properties reside in the method binding of the import.

Table 20 lists and describes the interaction specification property that you set. For information about how to read the property detail tables in the sections that follow, see "Guide to information about properties" on page 87.

Table 20. Interaction specification property for the Adapter for Enterprise Content Management

Property name	Description
"Maximum records for RetrieveAll operation"	Maximum number of result sets to return during a RetrieveAll operation

Maximum records for RetrieveAll operation

This property specifies the maximum number of records to return for a RetrieveAll operation.

Table 21. Maximum records for RetrieveAll operation details

Required	Yes
Default	100
Usage	
Property type	Integer
Globalized	No
Bidi supported	No

Globalization

WebSphere Adapter for Enterprise Content Management is a globalized application that can be used in multiple linguistic and cultural environments. Based on character set support and the locale of the host server, the adapter delivers message text in the appropriate language.

Support for globalization

The adapter is globalized to support single and multibyte character sets and deliver message text in the specified language.

Introduction

Globalized software applications are designed and developed for use within multiple linguistic and cultural environments rather than a single environment. WebSphere Adapters, WebSphere Integration Developer, WebSphere Process Server, and WebSphere Enterprise Service Bus are written in Java. The Java runtime environment within the Java virtual machine (JVM) represents data in the Unicode character code set. Unicode contains encoding for characters in most known character code sets (both single and multibyte). Therefore, when data is transferred between these integration system components, there is no need for character conversion.

To log error and informational messages in the appropriate language and for the appropriate country or region, the adapter uses the locale of the system on which it is running.

The adapter supports globalization for business objects and adapter foundation classes (AFC) related properties.

Globalization support for outbound and inbound properties

The Adapter for Enterprise Content Management supports globalized character for the following outbound and inbound properties.
- All DocumentClass Properties
- Managed Connection Factory Properties
- Log files
- Traces

Adapter messages

View the messages issued by WebSphere Adapter for Enterprise Content Management at the following location.

Link to messages: http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.wbit.help.messages.doc/messages.html

The displayed Web page shows a list of message prefixes. Click a message prefix to see all the messages with that prefix:
- Messages with the prefix CWYCM are issued by WebSphere Adapter for Enterprise Content Management
- Messages with the prefix CWYBS are issued by the adapter foundation classes, which are used by all the adapters

Related information

The following information centers, IBM Redbooks, and web pages contain related information for WebSphere Adapter for Enterprise Content Management.

Samples and tutorials

To help you use WebSphere Adapters, samples and tutorials are available from the Business Process Management Samples and Tutorials Web site. You can access the samples and tutorials in either of the following ways:

- From the welcome page that opens when you start WebSphere Integration Developer. To see samples and tutorials for WebSphere Adapter for Enterprise Content Management, click **Retrieve**. Then browse the displayed categories to make your selections.
- At this location on the Web: http://publib.boulder.ibm.com/bpcsamp/ index.html.

Information resources

- The WebSphere Business Process Management information resources web page includes links to articles, Redbooks, documentation, and educational offerings to help you learn about WebSphere Adapters: http://www14.software.ibm.com/ webapp/wsbroker/redirect?version=pix&product=wps-dist &topic=bpmroadmaps
- The WebSphere Adapters library page includes links to all versions of the documentation: http://www.ibm.com/software/integration/wbiadapters/ library/infocenter/

Information about related products

- WebSphere Business Process Management, version 6.2.x, information center, which includes WebSphere Process Server, WebSphere Enterprise Service Bus, and WebSphere Integration Developer information: http:// publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp
- WebSphere Adapters, version 6.1.x, information center: http:// publib.boulder.ibm.com/infocenter/dmndhelp/v6r1mx/index.jsp
- WebSphere Adapters, version 6.0, information center: http:// publib.boulder.ibm.com/infocenter/wbihelp/v6rxmx/topic/ com.ibm.wsadapters.doc/welcome_wsa.html
- WebSphere Business Integration Adapters information center: http://publib.boulder.ibm.com/infocenter/wbihelp/v6rxmx/index.jsp?topic=/ com.ibm.wbi_adapters.doc/welcome_adapters.htm

developerWorks® resources

- WebSphere Adapter Toolkit
- WebSphere business integration zone

Support and assistance

- WebSphere Adapters technical support: http://www.ibm.com/software/ integration/wbiadapters/support/
- WebSphere Adapters technotes: http://www.ibm.com/support/ search.wss?tc=SSMKUK&rs=695&rank=8 &dc=DB520+D800+D900+DA900+DA800+DB560&dtm. In the **Product category** list, select the name of the adapter and click **Go**.

Notices

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

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

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

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

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

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

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

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

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

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

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation
Department 2Z4A/SOM1
294 Route 100
Somers, NY 10589-0100
U.S.A.

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

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

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

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

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

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

COPYRIGHT LICENSE:

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

Each copy or any portion of these sample programs or any derivative work, must include a copyright notice as follows: (c) (your company name) (year). Portions of

this code are derived from IBM Corp. Sample Programs. (c) Copyright IBM Corp. _enter the year or years_. All rights reserved.

If you are viewing this information softcopy, the photographs and color illustrations may not appear.

Programming interface information

Programming interface information, if provided, is intended to help you create application software using this program.

General-use programming interfaces allow you to write application software that obtain the services of this program's tools.

However, this information may also contain diagnosis, modification, and tuning information. Diagnosis, modification and tuning information is provided to help you debug your application software.

Warning:

Do not use this diagnosis, modification, and tuning information as a programming interface because it is subject to change.

Trademarks and service marks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. These and other IBM trademarked terms are marked on their first occurrence in this information with the appropriate symbol ($^®$ or $^™$), indicating US registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A complete and current list of IBM trademarks is available on the Web at http://www.ibm.com/legal/copytrade.shtml

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

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

Java and all Java based trademarks and logos are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

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

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

This product includes software developed by the Eclipse Project (http://www.eclipse.org).

IBM®

Printed in USA