WebSphere Adapters

Version 6 Release 1

WebSphere Adapter for Email User Guide
Version 6 Release 1

WebSphere® Adapters

IBM

Version 6 Release 1

WebSphere Adapter for Email User Guide
Version 6 Release 1

Note
Before using this information and the product it supports, read the information in "Notices" on page 173.

16 January 2007

This edition applies to version 6, release 1, modification 0 of IBM WebSphere Adapter for Email and to all subsequent releases and modifications until otherwise indicated in new editions.

To send us your comments about this document, email mailto://doc-comments@us.ibm.com. We look forward to hearing from you.

When you send information to IBM, you grant IBM a nonexclusive right to use or distribute the information in any way it believes appropriate without incurring any obligation to you.

Contents

Chapter 1. Overview of WebSphere Adapter for Email

With WebSphere® Adapter for Email, you can create integrated processes that include the exchange of information using e-mail, without special coding.

For example, the adapter can be used to send general broadcast e-mails to a group of addresses or to send a notification e-mail to a single address that an action has taken place, such as a customer record update in a database. It can also forward information received in an e-mail message to WebSphere Process Server and use it to initiate a service (for example, to initiate a customer record update).

Suppose a company uses e-mail as its principal communication tool for most of its business operations. A new product is coming out and the marketing team wants to notify all of their business partners before information is made available to the public. WebSphere Adapter for Email can be used to send an e-mail broadcasting the new release date to a large group of e-mail addresses. Or, imagine that a customer sends an e-mail to a company to notify them that their address has changed. The adapter can be used to send the address change request to an application that keeps track of addresses and then return an e-mail to the customer notifying them when their address change request is complete.

The adapter is imported and configured in a module that is created in WebSphere Integration Developer and deployed to WebSphere Process Server or WebSphere Enterprise Service Bus. Once configured, the adapter acts like a service provider in part of a Service Oriented Architecture (SOA) implementation, providing operations to send and receive e-mails. Client applications interact with the module instead of directly with the mail server, so authentication details (such as user name and password) that you provide when you set up a module are shielded from client applications and services outside of the module. The adapter exposes a service interface that hides the mechanics of how the data or operations are obtained or executed.

What is the benefit? The module, which you create with the external service wizard in WebSphere Integration Developer, is a reusable unit designed to complete a specific inbound or outbound service. Each module uses a consistent interface and standard business objects, so applications consuming the service do not have to understand the lower-level details of the mail server.

New in this release

Provides a summary of new items added with this release. Read about new product features and functions, as well as new or corrected information that has been added to the documentation.

Updates to this information are made available at the WebSphere Adapters product support Web site. To read updated or additional information, see: http://www.ibm.com/software/integration/wbiadapters/support/.

New in version 6.1.0:

- New user-defined type data type added to the external service wizard. This business object wrapper generated when user-defined type is selected supports specific business object structures.

- Adapter pattern wizard provides a quick and easy way of creating a simple service with the adapter.
- New name, usability improvements, and functional enhancements in the enterprise service discovery wizard. The wizard has been renamed the external service wizard and has usability improvements and functional enhancements to make it easier for you to create and configure business objects and services for use with the adapter.
- Business graphs are now optional. The business graph that contains each business object in version 6.0.2 is now optional. You need a business graph only for modules whose business objects were created in version 6.0.2.
- New build Scenario does not modify user's schemas.
- Support for user defined Email business object to support custom operations.
- Support for new wrapper business object to send simple e-mails (without attachments) using the simple alert e-mail business object.
- Support for business faults

  The adapter now generates business faults for business exceptions. This lets you easily assign a corrective action for those error conditions.
- Expanded operating system support. For more information about what operating systems are supported in version 6.1.0, see the hardware and software requirements for theWebSphere Adapter for Email on the IBM Web site at http://www.ibm.com/support/docview.wss?uid=swg27006249.
- Automated migration of WebSphere Adapter for Email and associated external service wizard artifacts from version 6.0.2 to version 6.1.0.
- External service wizard creates three-level business objects instead of 5-level business objects. The adapter still provides continued runtime support for 5-level business objects created with version 6.0.2 using the activation specification property UseFiveLevelBO.
- Corresponding one-to-one delivery of business objects for each individual e-mail attachment processed by the adapter using the activation property EmitIndividualBOs.
- Secure Sockets Layer (SSL) and Federal Information Processing Standard (FIPS) 140 support.
- Support for node-level, or stand-alone, deployment of the adapter
- Simplified support for bidirectional script processing
- Logging, tracing, and monitoring functionality simplified.
- The adapter RAR file is available in WebSphere Integration Developer; you do not need to install it separately. The wizard automatically copies the adapter files into the project for you.
- The adapter documentation is located on the WebSphere Integration Developer Information Center, in the Configuring and using adapters section.

Hardware and software requirements

Before configuring and using the adapter, you must understand the hardware and software environment that it requires. These requirements are available online.

View the hardware and software requirements for the Adapter for Email on the IBM Web site at http://www.ibm.com/support/docview.wss?uid=swg27006249

Technical overview of the Adapter for Email

WebSphere Adapter for Email enables e-mail connectivity between WebSphere Process Server and one or more mail servers. The adapter itself is housed within a specific adapter module that you create using the external service wizard in WebSphere Integration Developer. Each module is created to perform an outbound or inbound service, such as retrieving e-mails from a mail server or sending unsolicited e-mails to a group of recipients.

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. The module is packaged and deployed to WebSphere Process Server as an enterprise archive (EAR) file.

In the simplest implementations, the adapter is used to send e-mails to one or more e-mail addresses. This is referred to as outbound communications because the adapter is part of a module designed to send e-mails out to a mail server. The adapter can also be used to poll a mail server for incoming e-mails and then send the information found in the e-mail to a service. The service consumes the information forwarded by the adapter to complete a task. This is called inbound communications.

In more complicated implementations, individual modules designed for inbound and outbound communications can be used together to initiate an automated flow of operation and then send an e-mail notification to an e-mail address to confirm that an action has been completed. Similarly, you can create an inbound module that listens for specific incoming e-mail events on the mail server, forwarding only those e-mail events to the service that contain a specific word in the subject field.

The adapter sends and receives e-mails to or from different mail servers using the SMTP e-mail protocol for all outbound communication and either the IMAP or POP3 e-mail protocol for inbound communication. Depending on what inbound protocol your mail server supports, you can choose between IMAP and POP3 in the external service wizard when you create your inbound module.

Outbound processing

WebSphere Adapter for Email supports outbound request processing. This means that when the adapter receives a request in the form of a business object from a service, it processes the request by creating and sending an e-mail to the mail server. An exception will be logged if any error occurs during request processing .

Outbound processing begins with the adapter receiving a business object from a service. This is called a request. When a request is received by the adapter, the adapter takes the information stored in the business object and creates an e-mail. This e-mail is then forwarded to the mail server for distribution. Business objects represent data that the adapter needs to create an e-mail and each one might include, among other things, attachments and e-mail addresses for where the e-mail should be sent. Once the adapter creates an e-mail from the information it takes from the business object, it sends the e-mail to the mail server for further distribution.

The following illustration shows how the adapter and module function together as part of an outbound service. A module created for outbound processing receives the business object, the business object is turned into an e-mail by the adapter, and then the adapter sends the e-mail to the mail server for distribution.

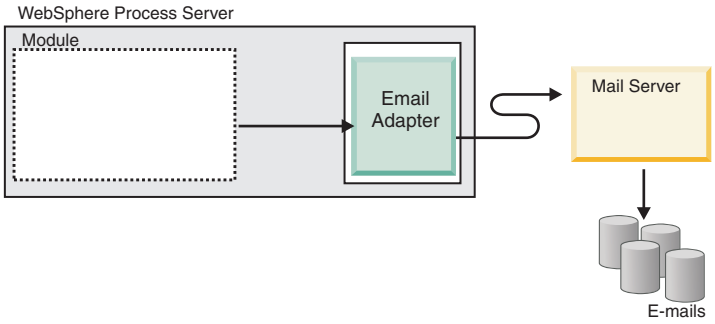


Figure 1. Email adapter as part of an outbound SOA implementation

Each outbound module contains components that form a service, including an import. An import is a component, but without an implementation. They identify services outside of the module, making them callable from within the module. To communicate with references, imports require EIS binding information, to specify how the data should be transported from the module. The assembly editor in WebSphere Integration Developer sets up the import and the EIS binding using a graphical interface.

The following illustration shows a more detailed view of the module in an outbound implementation. The I and R symbols within the illustration represent interfaces and references. Interfaces dictate to the users of a service, in this case the import, how the component can be used. It is a specification of the component's operations, which are createCustomer, createAddress, or createEmail for outbound. References declare what interface your service component will call. Each component in your module has one or more references. When you write your implementation for your service component using the assembly editor in WebSphere Integration Developer, you will call a reference instead of directly calling the component itself. This allows you to reassemble components in the future because you have not built dependencies into the code.

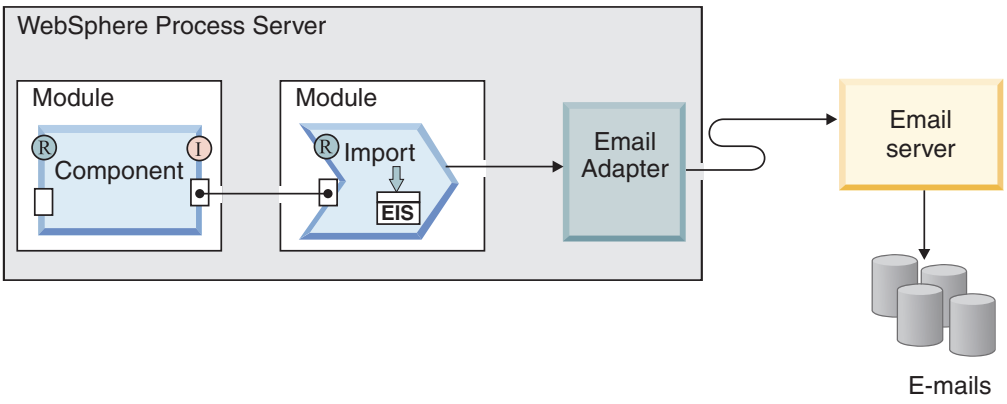


Figure 2. Outbound communication showing the import

During outbound processing, the adapter itself does not create e-mails. Instead, it converts the information received in a business object to a message that mail servers supporting the RFC822 format can understand.

Note: This process is not visible to you. It is only mentioned because the term ″RFC822 format″ appears in the reference section in regard to the e-mail headers the adapter supports.

When an e-mail server receives an e-mail message from the adapter, the mail server converts the message to an e-mail and sends it to all e-mail addresses listed in the To, Cc, and Bcc fields. If the adapter cannot send the message successfully to the server, it logs an EmailOutboundCreateException with an appropriate error message indicating the reason for failure.

Outbound data transformation

Data transformation during outbound communications refers to the process by which the adapter transforms business objects into multipart mime e-mail messages. While the adapter uses an adapter-specific data binding and data handlers to accomplish this, this actual transformation is external to the adapter and provided by WebSphere Process Server or WebSphere Enterprise Service Bus. The data bindings and data handlers that the adapter uses to compose an e-mail from the corresponding attributes in a business object are configured using the external service wizard in WebSphere Integration Developer.

Data bindings

Data bindings are responsible for reading the fields in a business object and filling the corresponding fields in an e-mail. Each data binding is a map that defines how a business object should be formatted.

During outbound communications, the data binding takes the following fields from a business object and populates the equivalent fields in an e-mail with their values:

- Headers
- Mail content
- Attachment

For data that does not require transformation the adapter conducts what is called pass-through processing, where data such as attachments pass through the system without being altered.

The adapter uses one of three data bindings during outbound communication. Each data binding corresponds to a business object structure or data type selected in the external service wizard. The following table lists these data bindings and their usage. A more detailed description of each data binding is provided in the sections that follow the table.

Table 1. Outbound data bindings

Data binding	Usage
Email simple data binding	Used for the simple alert e-mail data type
Email wrapper data binding	Used for generic e-mail and generic e-mail with business graph data types
Email fixed structure data binding	Used with the user defined data type
Email data binding	Used only with version 6.0.2 business objects for compatibility with earlier versions

Email simple data binding

The Email simple data binding is the default data binding for the simple alert e-mail data type in the external service wizard. This data binding corresponds to the simple alert e-mail business object structure that is described in this documentation.

Email wrapper data binding

The Email wrapper data binding is the default data binding for both the Generic Email and Generic Email with business graph data types in the external service wizard. This data binding corresponds to the Email business object structure that is described in this documentation.

Email fixed structure data binding

The Email fixed structure data binding is the default data binding for the ″user defined type″ data type in the external service wizard. This data binding corresponds to a specific business object structure defined by a user. With this data binding, the order of the attachments is significant. The attachments must be in the same order as the attributes in the business object. This data binding retains the order. For more information on the Email fixed structure data type, see the section devoted to the Email fixed structure business object structure in this documentation.

Email data binding

This data binding is used exclusively for compatibility with business objects created in version 6.0.2 or earlier. This data binding supports the five-level business object structure used in version 6.0.2 of the adapter.

Data handlers

In addition to data bindings, data transformation requires the use of a data handler. Data handlers perform the conversions between a business object and a particular MIME format. Data handlers are provided by WebSphere Process Server or WebSphere Enterprise Service Bus.

For data that does not need to be transformed, such as some attachments, the adapter can be configured to conduct what is called pass-through processing. In a pass-through configuration, data passes directly from the business object to the e-mail without being altered.

Inbound processing

The Adapter for Email supports inbound processing of events. Inbound event processing means that the adapter polls the mail server at specified intervals for new e-mails that are ready for processing. When the adapter detects an e-mail event that is ready to be processed, it converts the e-mail event data into a business object and sends it to the consuming service.

During inbound communications, the adapter polls the mail server for new e-mails. These are called events. When the adapter detects a new event, it reads the e-mail and creates a business object to represent the e-mail content. The adapter then forwards the business object to the export and the export delivers the business object to a service. Business objects carry the information the adapter

takes from an e-mail. By converting e-mails to business objects and forwarding them to a service, the services using your adapter module do not have to deal directly with the mail server; it is the adapter that polls for events, changes them to a format the consuming services can understand (business objects), and then forwards them to the export for delivery to the services that consume them.

The following high-level illustration shows the adapter as part of an inbound service. The adapter polls the mail server for incoming e-mail events, the adapter converts polled events into business objects, and then the adapter sends them to a consuming service.

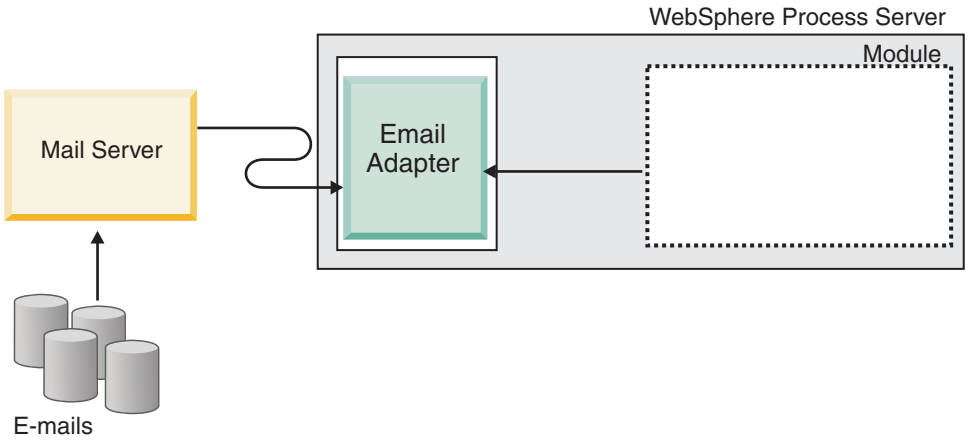


Figure 3. Adapter as part of an inbound SOA implementation

Each inbound module contains components that form a service, including an export. An export is a component, but without an implementation. Exports allow components in a module to provide their services to external clients. Exports require an EIS binding, which specifies the means of transporting the data from the modules. The assembly editor in WebSphere Integration Developer sets up the export, lists the supported bindings, and simplifies its creation. For inbound requests, business objects are essentially the logical graphical representation of an incoming e-mail's content, appearing as output from the export that represents the module in the assembly diagram.

The following illustration shows a more detailed view of the module in an inbound implementation. The I and R symbols within the illustration represent interfaces and references. An interface dictates to the users of a service component, in this case the export, how the component can be used. It is a specification of the component's operations, which for inbound communication is limited to the Read operation. A reference declares the interface that your service component will call. Each component in your module has one or more references. When you write your implementation for your service component using the assembly editor in WebSphere Integration Developer you will call a reference instead of directly calling the component itself. This allows you to reassemble components in the future because you have not built dependencies into the code.

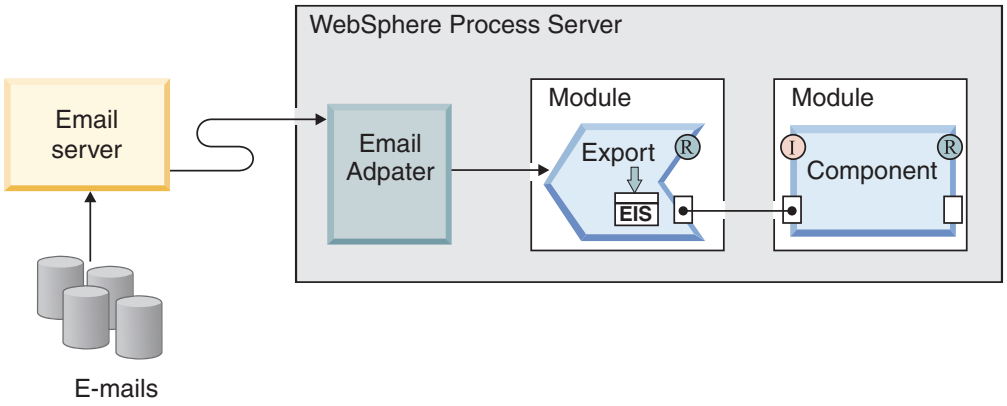


Figure 4. Inbound communication showing the export

Supported inbound protocols

The adapter supports two different inbound e-mail protocols: POP3 and IMAP. With each, the adapter polls the mail server at a specified interval for inbound events and when an e-mail is detected on the mail server, the adapter converts it to a business object. The adapter considers any e-mail in the specified inbox folder on the mail server that is ready for processing an event.

Depending on your mail server, you might be able to choose which inbound e-mail protocol the adapter will use. Differences between the protocols and a description of how the adapter works with each protocol are noted in Table 2 and the sections that follow.

Table 2. Differences between the IMAP and POP3 protocols

IMAP	POP3
Supports the existence of multiple mail folders on a mailbox.	Supports only one mailbox (named Inbox) per user.
Allows a copy of the e-mail to remain on the mail server after the client receives the e-mail.	Supports a View-once-only feature on the server. The mail is deleted from the mail server after the client receives a copy it.

Inbound with IMAP

If you use the IMAP protocol for your inbound communications, the following steps will take place:

1. The adapter polls the mail folders at regular intervals and logs any unread e-mails as events in the event store. You can use the activation specification PollFolders property to customize the list of folders that are searched by the adapter.

   Note: If you specify multiple mail server folders for the mail server account in the PollFolders property, the adapter polls all mail server folders sequentially.
2. Search criteria determines which e-mail events are picked up from the mail server. The adapter picks up all e-mail events that match the search criteria. If no search criteria is specified, the adapter picks up all unread e-mail.
3. The adapter writes all polled e-mail events to the staging directory. Once an e-mail event is written to the staging directory, it is deleted from the mail server.

4. The adapter transforms each e-mail event into an Email business object. Headers, e-mail body content, and mail attachments are recorded within the business object.
5. Email business object is sent to the export.
6. After it has been processed, the adapter deletes processed e-mails from the staging directory and archives them (if archiving is selected).

   Note: If the archive file naming pattern activation specification property is specified, the file names will conform to the pattern.

For more information about the folders required for archiving, see the section on required folders for inbound communication.

Inbound with POP3

If you use the POP3 protocol for your inbound communications, the adapter performs the following steps during inbound operations (from the mail server to the service):

1. Polls the Inbox folder on the mail server for inbound events (new e-mails). When it finds an e-mail, it logs it as a new event in the event table.

   Note: If you specify search criteria, all unread e-mails that fit the search criteria are picked up by the adapter. If no search criteria is specified, the adapter picks up all unread e-mail.
2. Writes new e-mail events to the staging directory as files and then deletes them from the mail server.
3. Converts the e-mail into a business object. Headers, e-mail body content, and mail attachments are recorded within the business object.
4. Sends the business object to the export.
5. Deletes all processed e-mail from the staging directory and archives them if the archiving property is configured.

   Note: If the archive file naming pattern property is specified, the file names will conform to the pattern. If it is not specified, the name will remain the same as it is in the staging directory.

Inbound data transformation

Data transformation during inbound communications refers to the process by which the adapter transforms multipart mime e-mail messages into business objects. While the adapter uses an adapter-specific data binding and data handlers to accomplish this, this actual transformation is external to the adapter and provided by WebSphere Process Server or WebSphere Enterprise Service Bus. The data bindings and data handlers that the adapter uses to read the contents of an e-mail and fill the corresponding attributes in a business object are configured using the external service wizard in WebSphere Integration Developer.

Data bindings

To take fields from an e-mail and populate a business object, the adapter needs a data binding. Data bindings are responsible for reading the fields in an e-mail and filling up the corresponding fields in a business object.

During inbound communications, the data binding takes the following fields from an e-mail and populates the parent Email business object attributes with their values:

- Headers
- Mail content
- Attachment

For data that does not require transformation the adapter conducts what is called pass-through processing, where data such as attachments pass through the system without being altered.

To transform data in the form of e-mails coming into the adapter, the adapter uses one of three data bindings. The following table lists these data bindings and their usage. A more detailed description of each data binding is provided in the sections that follow the table.

Table 3. Inbound data bindings

Data binding	Usage
"Email wrapper data binding"	Default data binding
"Email fixed structure data binding"	Used with fixed structure business objects
"Email data binding"	Used with version 6.0.2 business objects

Email wrapper data binding

The Email wrapper data binding is the default data binding for both the Generic Email and Generic Email with Business Graph data types in the external service wizard. This data binding corresponds to the Email business object structure that is described in this documentation.

Email fixed structure data binding

The Email fixed structure data binding is the default data binding for the user defined type data type in the external service wizard. This data binding corresponds to a specific business object structure defined by a user. With this data binding, the order of the attachments is significant. The attachments must be in the same order as the attributes in the business object. This data binding retains the order. For more information on the Email fixed structure data type, see the section devoted to the Email fixed structure business object structure in this documentation.

Email data binding

This data binding is used exclusively for compatibility with business objects created in version 6.0.2 or earlier. This data binding supports the five-level business object structure used in version 6.0.2 of the adapter.

Data handlers

In addition to data bindings, data transformation requires the use of a data handler. Data handlers perform the conversions between a particular MIME format and a business object. Data handlers are provided by WebSphere Process Server or WebSphere Enterprise Service Bus.

For data that does not need to be transformed, such as some attachments, the adapter can be configured to conduct what is called pass-through processing. During a pass-through configuration, data passes directly from the e-mail to the business object without being altered.

Event store

The event store is a persistent cache where event records are saved until the polling adapter can process them.

The adapter uses an event store to keep track of inbound events as they make their way through the system. When a file is created, updated, or deleted, the adapter updates the status of the corresponding event in the event store. For recovery purposes, the adapter continually maintains the status of the event in the event store until the event is delivered to WebSphere Process Server. If the adapter is abruptly terminated, the adapter uses the event store to determine which events have and have not been processed.

Although an event store is not required for the adapter to process inbound requests, the adapter will create one when the module is deployed to the runtime environment if the event persistence feature is configured in the external service wizard and it detects that an event store does not already exist for the inbound module in the database.

Each event store created by the adapter is associated with a specific inbound module. The adapter does not support multiple adapter modules pointing to the same event store.

Business objects

A business object is a structure that consists of data, the action to be performed on the data, and additional instructions, if any, for processing the data. The data can represent anything from a customer record to an e-mail attachment. The adapter uses business objects to either obtain information from an e-mail or to produce an e-mail.

How the adapter uses business objects

The adapter's main job during outbound processing is to receive a business object from a service, create an e-mail from the details it finds in the business object, and then send the e-mail message to the mail server for distribution. For inbound processing, this process happens in reverse. The adapter takes information from an e-mail, converts it to a business object, and forwards it to a service.

How data is represented in business objects

Business objects are created using either the business object editor or external service wizard in WebSphere Integration Developer. As shown in the illustration below, a business object consists of a set of fields and a type of data, such as a string or integer. This is a customer business object. As you can see, it records name, address, and telephone number information for a customer record. This example uses string values, but many other values are supported by the business object editor.

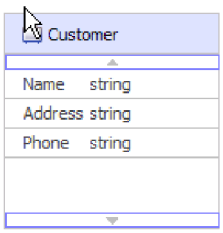


Figure 5. Customer business object

A field may, in turn, be another business object. For example, the illustration below shows a customer business object that contains another business object. In this case, a company selling pet-related items may want to keep track of names and species information for its customers' pets. The pet business object stores the name and species information for one customer pet.

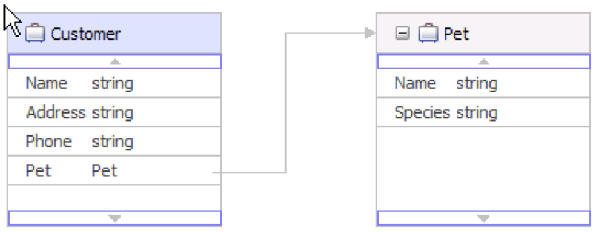


Figure 6. Customer business object with child Pet business object

Each business object is associated with an operation. The operation in turn associates with the wrapper. The operation tells the adapter what to do with the wrapper business objects. The following operations are examples of create operations used by the adapter to create e-mails during outbound communications:

- Create Customer
- Create Address

No matter what name you give an operation for your module, the CreateEmail operation is what is actually performed by the adapter.

For inbound communications, Emit is the only supported operation. This operation is used to take information from an e-mail and convert it to business objects.

You can optionally choose, during adapter configuration, to generate a business graph. In version 6.0.2, each top-level business object is contained in a business graph, which includes a verb that an application can use in version 6.0.2 to specify additional information about the operation to be performed. In version 6.1.0, business graphs are optional; they are required only when you are adding business objects to a module created with a version of WebSphere Integration Developer earlier than version 6.1.0. If business graphs exist, they are processed, but the verb is ignored.

How business objects are created

Business objects and their wrapper objects are created by the external service wizard from XSD files either imported from another module or created with WebSphere Integration Developer Business Object Editor. For any business object structure except the simple alert e-mail structure, you must create or import the XSD files you want the adapter to make into business objects before you run the

external service wizard. If transformation is needed, a business object that maps to the e-mail body or an attachment that needs transformation must exist. A generic e-mail business object is available for pass-through operations. Or, if only a simple alert e-mail is needed (no attachments), the adapter provides a simple alert e-mail structure with standard headers as another option.

You create business objects for your module with the external service wizard, which is launched from WebSphere Integration Developer. If you have defined XSD files using the business object editor before starting the external service wizard, the adapter will creates business objects from these schemas.

Custom wrapper business objects

If you choose to use custom business objects, you must first create business object schema files (XSD files) using the WebSphere Integration Developer business object editor. Then you can use the external service wizard to generate business objects from the XSD files. A custom wrapper business object can be created from an existing business object or from XSD files.

Custom wrapper business objects are useful if you have an existing map or mediation that expects a business object to have a protocol-specific wrapper. The custom wrapper business object does not allow child objects of anyType. Using anyType restricts you from using maps and mediation wiring, because you would have to write programs or code to fetch business objects from the anyType field. Such code would have to be written if child objects of anyType are allowed, because the user does not know what type of business object is being set on the anyType field.

The external service wizard

The external service wizard provides a blueprint to create services from existing elements like business objects. Using the external service wizard, you can create business object schema files, build service descriptions, define connection properties for the mail server, and generate business objects that contain everything the adapter needs to conduct inbound and outbound communications.

With the external service wizard, you can perform the following actions:

- Create business object schema files
- Build service descriptions
- Define connection properties for the adapter to connect to the mail server
- Generate business objects that contain everything the adapter needs to conduct inbound and outbound communications

Standards compliance

This product is compliant with several government and industry standards, including accessibility standards and Internet protocol standards.

Accessibility

IBM® strives to provide products with usable access for everyone, regardless of age or ability. WebSphere Adapters are fully accessible and section 508-compliant. Accessibility features enable users with physical disabilities, such as restricted mobility or limited vision, to operate software products successfully. These features are built into the installation and administration features of WebSphere Adapters.

Administration

The run time administrative console is the primary interface for deployment and administration of enterprise applications. The console is displayed within a standard Web browser. By using an accessible Web browser, such as Microsoft® Internet Explorer or Netscape Browser, you are able to:

- Use screen-reader software and a digital speech synthesizer to hear what is displayed on the screen
- Use voice recognition software, such as IBM ViaVoice®, to enter data and to navigate the user interface
- Operate features by using the keyboard instead of the mouse

You can configure and use product features by utilizing standard text editors and scripted or command-line interfaces instead of the graphical interfaces that are provided.

When appropriate, the documentation for specific product features contains additional information about the accessibility of the features.

External service wizard

The external service wizard is the primary component used to create modules. This wizard, which is implemented as an Eclipse plug-in that is available through WebSphere Integration Developer, is fully accessible.

Keyboard navigation

This product uses standard Microsoft Windows® navigation keys.

IBM and accessibility

See the *IBM Accessibility Center* web site http://www.ibm.com/able/ for more information about the commitment that IBM has to accessibility.

Internet Protocol Version 6 (IPv6)

WebSphere Process Server and WebSphere Enterprise Service Bus rely on WebSphere Application Server for Internet Protocol Version 6 (IPv6) compatibility.

IBM WebSphere Application Server, version 6.1.0 and later and its JavaMail component support pure Internet Protocol Version 6.0 (IPv6).

For more information about this compatibility in WebSphere Application Server, see IPv6 support in the http://www.ibm.com/software/webservers/appserv/was/library/.

For more information about IPv6, see http://www.ipv6.org.

Chapter 2. Planning for adapter implementation

Before you configure WebSphere Adapter for Email, consider whether you will set up the adapter in a clustered environment, in which the workload of the server is distributed across multiple machines. Also, if you are migrating from an earlier version of WebSphere Adapter for Email, perform any migration tasks.

Before you begin

Before you begin to set up and use the adapter, you should possess a thorough understanding of business integration concepts, the capabilities and requirements of the integration development tools and runtime environment you will use, and the mail server environment where you will build and use the solution.

To configure and deploy WebSphere Adapter for Email you should understand and be familiar with the following concepts, tools, and tasks:

- The business requirements of the solution you are building.
- The mail server's security and configuration needs.
- Business integration concepts and models, including the Service Component Architecture (SCA) programming model.
- The capabilities and requirements of WebSphere Process Server. You should know how to configure and administer the host server and how to use the administrative console to set and modify property definitions, configure connection factories, and manage events.
- The tools and capabilities provided by WebSphere Integration Developer. You should know how to use these tools to create modules, wire and test components, and complete other integration tasks.

Security

WebSphere Adapter for Email supports user name and password authentication methods of Java™ 2 as implemented in J2C. Java 2 has other security methods, such as kerberos, which we do not support. These details are configured using the external service wizard. Secure socket layers (SSL) can be configured to protect the integrity of information being passed between the mail server and the adapter and, for users who require it, the adapter can be configured to run in support of the Federal Information Processing Standard (FIPS) 140.

Antivirus software

If an antivirus program is running on your system (the machine on which the adapter is deployed or the one that hosts the e-mail server), the adapter might fail to send outbound e-mails. This happens because some types of antivirus software have auto protection turned on for internet e-mail protection. When auto protection is turned on, the antivirus software might choose to treat open connections to an e-mail server as malicious attacks and will block all e-mail using that connection. Since the adapter maintains the connections to the e-mail server in the pool, it does not close any of the connections. This might result in the antivirus program blocking all e-mail from the adapter.

By default, the **Select when antivirus or firewall software is running** check box in the connection properties screen of the external service wizard is selected. This

means that the adapter will close the connection after each outbound request.

Configuring secure socket layers

Data that travels across a network can be intercepted by third parties. When this data includes private information such as passwords or credit card numbers, steps should be taken to make this data unintelligible to unauthorized users. By configuring secure e-mailing using socket layers (SSL), you protect the integrity of information being passed between the mail server and the adapter.

Before you begin

To enable SSL, the following prerequisites must be satisfied:

- Mail server must support secure IMAP, POP3, and SMTP communication using SSL
- The mail server has its own private key and certificate
- An e-mail client must be installed

About this task

E-mails passing through the mail server are vulnerable to third party interference when SSL is not configured for use with the adapter. Using SSL prohibits data from being modified intentionally or unintentionally during transport and protects data from being intercepted. It is effective because it uses several cryptographic processes– public key cryptography for authentication with the mail server and secret key cryptography and digital signatures for privacy and data integrity. SSL allows the adapter to authenticate the identity of the mail server and, when necessary, for the mail server to authenticate the identity of the mail client.

Restriction: During inbound communications WebSphere Adapter for Email version 6.1.0 fails to connect to Microsoft Exchange server 2003 when SSL (Secure Socket Layer) is used. Currently there are no known workarounds to configure WebSphere Adapter for Email with Microsoft Exchange Server 2003 in the FIPS mode. Version 6.1.0 of the adapter was tested with Lotus Domino Server 7.0 for SSL.

Procedure

1. Set the e-mail client trust store. A trust store helps an e-mail client decide what it can trust. During SSL, WebSphere Process Server sends its certificate to the e-mail client for verification. The e-mail client verifies the certificate to ascertain that it is communicating with the intended mail server. To enable this verification process, the mail server's certificate should be present in the client's trust store.
   a. In WebSphere Integration Developer, right-click the server and click **Run administrative console**.
   b. Expand **Security**.
   c. Select **SSL certificate and key management**.
   d. Under Related items, select **Key stores and certificates**.
   e. Select **NodeDefaultTrustStore**.

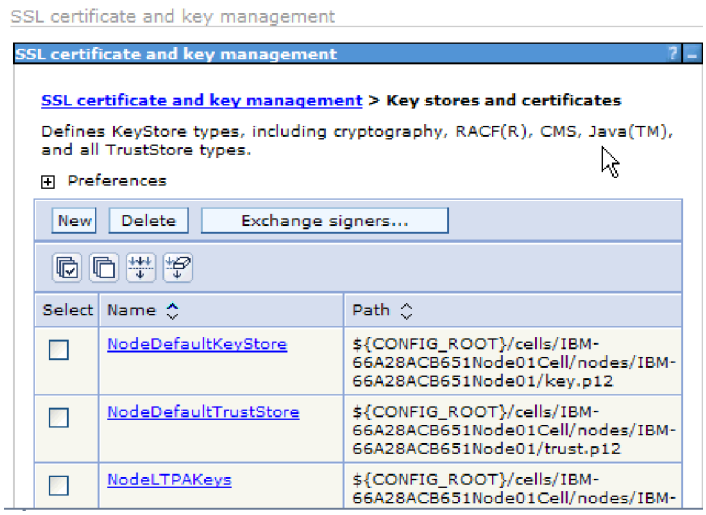


Figure 7. Selecting NodeDefaultTrustStore

f. Under Additional properties, select **Signer certificates**.

g. Click **Add**.

h. In the **Alias** field, type the certificate name.

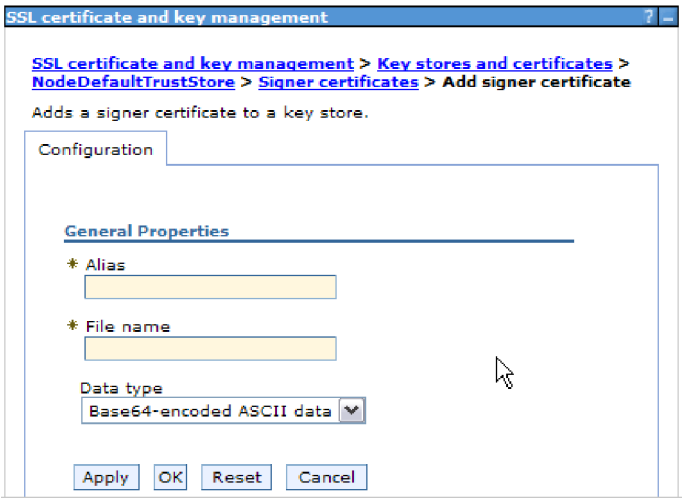


Figure 8. Adding signer certificate properties for the mail server certificate

i. In the **File name** field, type the full path of the mail server certificate.

j. Click **OK**

2. Configure SSL properties for the adapter.

   a. In the external service wizard, set **enableSSL** to `True`. By default, **enableSSL** is set to `False`.

   b. When using SSL for inbound communication, set the port number to `995` if you are using the IMAP e-mail protocol and `993` if you are using the POP3 e-mail protocol. For outbound using the SMTP e-mail protocol, set the port number to `465`.

Configuring the module for federal information processing standard 140

The federal information processing standard 140 (FIPS) is an United States government standard for cryptographic features like encryption, decryption, hashing (message digests), secure socket layers, transport layer security, internet protocol security, secure shell, signatures, key exchange, and key or certificate generation used in software products and modules. For users working with the United States government who must conform to the FIPS standard, the adapter can be configured to run in FIPS mode.

About this task

Configuring the module to run in FIPS mode restricts the adapter to working with modules whose cryptographic features comply with FIPS approved methods and providers. From an adapter perspective, running in FIPS mode restricts the adapter to using the transport layer security (TLS) secure socket protocol.

Restriction: WebSphere Adapter for Email fails to connect to Microsoft Exchange server 2003 when FIPS (SSL 3.1 and TLS 1.0) is configured for inbound communications. The adapter generates exceptions during start up. Currently there are no known workarounds to configure WebSphere Adapter for Email for use with Microsoft Exchange Server 2003 in the FIPS mode. Version 6.1.0 of the adapter was tested with SurgeMail 3.8 for FIPS.

To run the adapter in FIPS mode, you must instruct the adapter to use the IBM Java Secure Socket Extension (IBMJSSE2) provider package. The IBMJSSE2 provider is the preregistered Java secure socket extension provider in the java.security file in IBM SDK, version 5.0. IBMJSSE2 uses FIPS-approved packages.

Complete the following steps to run the adapter in FIPS mode:

Procedure

1. In the IBMJSSE2 provider, set the com.ibm.jsse2JSSEFIPS property to `True`.
2. Set the following security properties so the IBMJSSE2 provider will handle all JSSE requests.
   a. Set the ssl.SocketFactory.provider property to `com.ibm.jsse2SSLSocketFactoryImpl`.
   b. Set the ssl.SocketFactory.provider property to `com.ibm.jsse2SSLServerSocketFactoryImpl`.
3. In the security properties file, add the IBMJCEFIPS provider `com.ibm.crypto.fips.provider.IBMJCEFIPS` to the provider list above the IBMJCE provider. Follow the *security.provider.n=providername* format where *n* denotes the order of the provider. The provider with a value of 1 is considered before the provider with a value of 2. Do not remove the IBMJCE provider.
4. Set system properties in the WebSphere Process Server administrative console Java virtual machine (JVM) properties. Follow the -D*propertyname=propertyvalue* format.
5. Set security properties in the java.security file (located in the *WebSphere Process Server java virtual machine*/lib/security directory).

Required folders for inbound processing

Before running the adapter, you must create one or more poll folders on your mail server and a staging folder where the adapter saves all polled e-mails as files. These folders are required and neither type will be created by the adapter. Also, to use the archiving functionality of the adapter to store successfully processed and failed e-mail events you must also create an archive folder and a failed event folder.

Required folders for inbound communication

The adapter requires that there be a folder on the local drive that holds e-mails marked in progress in the event store. This is called the staging directory in the external service wizard. Since the adapter will not create a staging directory for you, you must create one before you start the external service wizard.

Optional folders for archiving

You can configure the adapter to save copies of successful and failed e-mails. This is called archiving. To do this, you must create both of the following folders before you run the adapter.

- Archive folder – A file system folder where the adapter archives successful events.
- Failed event folder – A file system folder where the adapter archives failed events.

When the ArchiveFolder property is specified, all successfully processed mail will be moved into the archive folder from the staging folder. If you leave this property blank all successfully processed mail is deleted from the staging folder.

If the FailedEventsFolder is specified, all unsuccessfully processed mail will be moved into the failed events folder from the staging folder. If you leave this property blank, all failed mail is deleted from the in staging folder.

For more information on either of these folder properties, see the section on activation specification properties located in the reference chapter of this book.

User authentication

The adapter supports several methods for supplying the user name and password that are needed to connect to the mail server. Understand the features and limitations of each method to pick a method that provides the appropriate level of security and convenience for your application.

To integrate an adapter into your application, you must provide the user name and password for the adapter to use at run time on WebSphere Process Server or WebSphere Enterprise Service Bus to connect to the mail server to process outbound requests and inbound events.

At run time, the adapter needs to provide the user name and password to connect to the mail server. To connect without user intervention, the adapter must access a saved copy of the user information. In a server environment, there are several methods for saving user information. The external service wizard lets you configure the adapter to get the user information using any of the following methods:

- Adapter properties
- Data source
- J2C authentication alias

Saving the user name and password in adapter properties is a direct way to provide this information at run time. You provide this user name and password when you use the external service wizard to configure your module. Although directly specifying the user name and password seems the most straightforward method, it has important limitations. Adapter properties are not encrypted; the password is stored as clear text in fields that are accessible to others on the server. Also, when the password changes, you must update the password in all instances of the adapter that access that mail server. This includes the adapters embedded in application EAR files as well as adapters that are separately installed on the server.

Using a data source lets you use a connection already established for another application. For example, if multiple applications access the same database with the same user name and password, the applications can be deployed using the same data source. The user name and password can be known only to the first person who deploys an application to that data source or who defines a data source separately.

Using a J2C authentication alias created with the Java Authentication and Authorization Service (JAAS) is a robust, secure way to deploy applications. An administrator creates the authentication alias that is used by one or more applications that need to access a system. The user name and password can be known only to that administrator, who can change the password in a single place when a change is required.

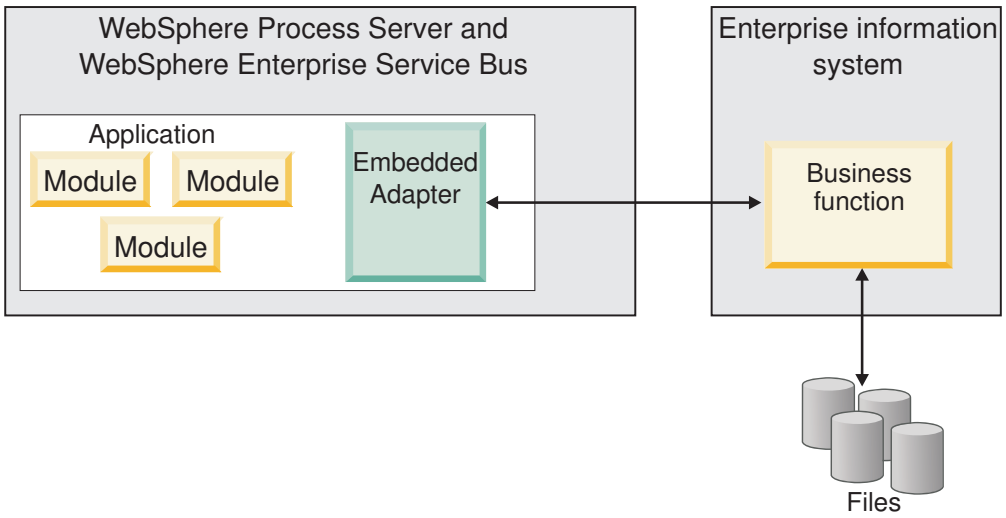
Deployment options

You can choose to embed the adapter to be part of the deployed application or you can choose to deploy the RAR file stand-alone.

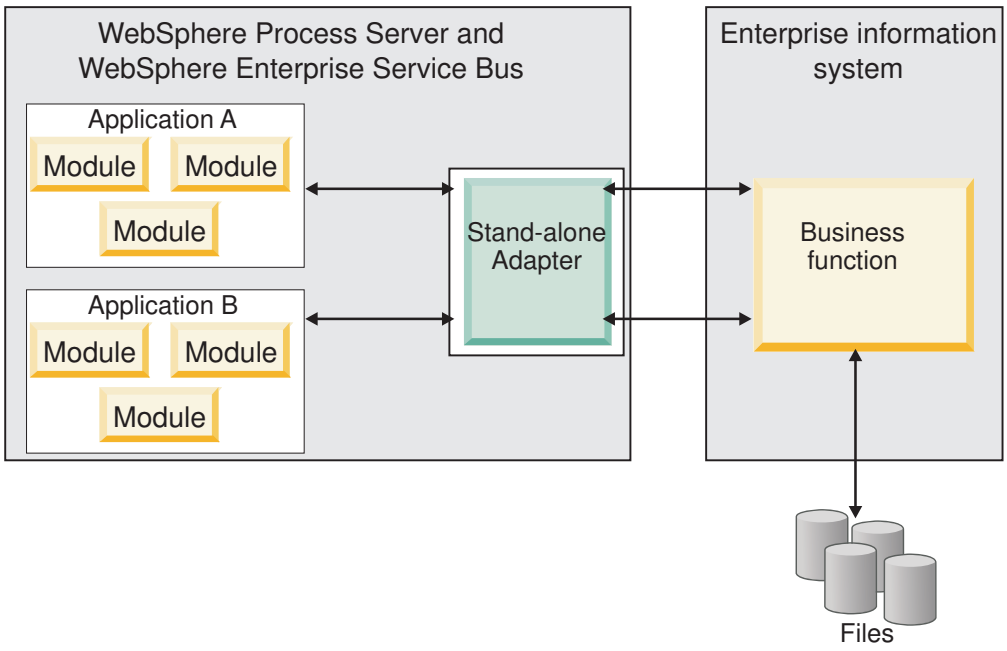
The deployment options are described below:

- **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.

An embedded adapter is bundled within an enterprise archive (EAR) file and is available only to the application with which it is packaged and deployed.



A stand-alone adapter is represented by a stand-alone resource adapter archive (RAR) file, and when deployed, it is available to all deployed applications in the server instance.



While creating the project for your application using WebSphere Integration Developer, you can choose how to package the adapter [either bundled with the (EAR) file or as a stand-alone (RAR) file]. Your choice will affect how the adapter is used in the runtime environment, as well as how the properties for the adapter are displayed on the administrative console.

Choosing either to embed an adapter with your application or to deploy the adapter as a stand-alone module depends on how you want to administer the adapter. If you want a single copy of the adapter and do not care about disruption to multiple applications when you upgrade the adapter, then you would be more likely to deploy the adapter as a stand-alone module.

If you plan on running multiple versions, and if you care more about potential disruption when you upgrade the adapter, you would be more likely to embed the adapter with the application. Embedding the adapter with the application allows you to associate an adapter version with an application version and administer it as a single module.

Considerations for embedding an adapter in the application

Take into consideration the following items if you plan on embedding the adapter with your application:

- An embedded adapter has class loader isolation.

  A class loader affects the packaging of applications and the behavior of packaged applications deployed on runtime environments. *Class loader isolation* means the adapter cannot load classes from another application or module. Class loader isolation prevents two similarly named classes in different applications from interfering with each other.
- Each application in which the adapter is embedded must be administered separately.

Considerations for using a stand-alone adapter

Take into consideration the following items if you plan on using a stand-alone adapter:

- Stand-alone adapters have no class loader isolation.

  Because stand-alone adapters have no class loader isolation, only one version of any given Java artifact is run and the version and sequence of that artifact is undetermined. For example, when you use a stand-alone adapter there is only *one* resource adapter version, *one* adapter foundation class (AFC) version, or *one* third-party JAR version. All adapters deployed as stand-alone adapters share a single AFC version, and all instances of a given adapter share the same code version. All adapter instances using a given third-party library must share that library.
- If you update any of these shared artifacts, all applications using the artifacts are affected.

  For instance, if you have an adapter that is working with server version X, and you update the version of the client application to version Y, your original application might stop working.
- AFC is compatible with previous versions, but the latest AFC version must be in every RAR file that is deployed in a stand-alone manner.

  If more than one copy of any JAR file is in the classpath in a stand-alone adapter, the one that is used is random; therefore, they all must be the latest version.

WebSphere Adapters in clustered environments

You can improve adapter performance and availability by deploying the module to a clustered server environment. The module is replicated across all servers in a cluster, regardless of whether you deploy the module using a stand-alone or embedded adapter.

WebSphere Process Server, WebSphere Application Server Network Deployment, and WebSphere Extended Deployment support clustered environments. Clusters are groups of servers that are managed together to balance workloads and to provide high availability and scalability. When you set up a server cluster, you

create a Deployment Manager profile. The HAManager, a subcomponent of the Deployment Manager, notifies the JCA (Java EE Connector Architecture) container to activate the adapter instance. The JCA container provides a runtime environment for adapter instances. For information about creating clustered environments, see the following link: http://publib.boulder.ibm.com/infocenter/wasinfo/v6r1/index.jsp?topic=/com.ibm.websphere.nd.doc/info/ae/ae/trun_wlm_cluster_v61.html.

Using WebSphere Extended Deployment, you can optionally enhance the performance of adapter instances in your clustered environment. WebSphere Extended Deployment extends the WebSphere Application Server Network Deployment capabilities by using a dynamic workload manager instead of a static workload manager, which is used by WebSphere Application Server Network Deployment. The dynamic workload manager can optimize the performance of adapter instances in the cluster by dynamically balancing the load of the requests. This means that application server instances can be automatically stopped and started based on the load variations, allowing machines with different capacities and configurations to evenly handle load variations. For information on the benefits of WebSphere Extended Deployment, see the following link: http://publib.boulder.ibm.com/infocenter/wxdinfo/v6r1/index.jsp.

In clustered environments, adapter instances can handle both inbound and outbound processes.

Restriction: During inbound communication WebSphere Adapter for Email is not able to switch pooling between a WebSphere Process Server cluster backup node and the cluster's primary node when each node is installed on a different operating system. For example, if the adapter starts pooling on a primary Windows node, it cannot switch to a backup UNIX node it cannot process the Windows path used for the directory storing in progress events.

High availability for inbound processes

Inbound processes are based on events triggered as a result of updates to data in the mail server. WebSphere Adapter for Email is configured to detect updates by polling an event table. The adapter then publishes the event to its endpoint.

Important: In a clustered environment, the event directory should be on a shared file system and not local to any of the cluster machines.

When you deploy a module to a cluster, the JCA (Java EE Connector Architecture) container checks the enableHASupport resource adapter property. If the value for the enableHASupport property is true, which is the default setting, all of the adapter instances are registered with the HAManager with a policy 1 of N. This policy means that only one of the adapter instances starts polling for events. Although other adapter instances in the cluster are started, they remain dormant with respect to the active event until the active adapter instance finishes processing the event. If the server on which the polling thread was started shuts down for some reason, an adapter instance that is running on one of the backup servers is activated.

Important: Do not change the setting of the enableHASupport property.

High availability for outbound processes

In clustered environments, multiple adapter instances are available to perform outbound process requests. Accordingly, if your environment has multiple applications that interact with WebSphere Adapter for Email for outbound requests, then you might improve performance by deploying the module to a clustered environment. In a clustered environment, multiple outbound requests can be processed simultaneously, as long as they are not attempting to process the same record.

If multiple outbound requests are attempting to process the same record, such as a Customer address, the workload management capability in WebSphere Application Server Network Deployment distributes the requests among the available adapter instances in the sequence they were received. As a result, these types of outbound requests in a clustered environment are processed in the same manner as those in a single server environment: one adapter instance processes only one outbound request at a time. For more information on workload management, see the following link: http://publib.boulder.ibm.com/infocenter/wasinfo/v6r1/index.jsp?topic=/com.ibm.websphere.nd.doc/info/ae/ae/trun_wlm.html.

Migrating to version 6.1.0

By migrating to version 6.1 of WebSphere Adapter for Email, you automatically upgrade from the previous version of the adapter. Additionally, you can migrate your applications that embed an earlier version of the adapter, so that the applications can utilize features and capabilities present in version 6.1.

Migration considerations

WebSphere Adapter for Email version 6.1.0 includes updates that might affect your existing applications. Before migrating applications that will utilize WebSphere Adapter for Email, take into consideration the information in the sections that follow.

Compatibility with earlier versions

WebSphere Adapter for Email version 6.1.0 is fully compatible with version 6.0.2 of the adapter and can work with custom business objects (XSD files), and data bindings.

Because version 6.1.0 of WebSphere Adapter for Email is fully compatible with version 6.02, any of your applications that utilized version 6.0.2 of WebSphere Adapter for Email will run unchanged when you upgrade to version 6.1.0. However, if you want your applications to utilize features and functionality present in version 6.1.0 of the adapter, run the migration wizard.

The migration wizard replaces (upgrades) version 6.0.2 of the adapter with version 6.1.0 *and enables version 6.1.0 features and functionality for use with your applications.*

Note: The migration wizard does not create new or modify existing mitigating code, such as mappers and mediators to work with version 6.1.0 of the adapters. If any of your applications embed a version 6.0.2 or earlier version of an adapter and you are upgrading to version 6.1.0, and you want your applications to take advantage of the features and functions in version 6.1.0, you might need to make changes to those applications.

As a result of migration to version 6.1.0, data bindings, maps and mediations will break due to the change of business object structure implemented in version 6.1.0. Business objects created with version 6.0.2 were created using a five-level (EmailBG->Email->CustomerWrapperBG->CustomerWrapper->Customer business object) hierarchy, while version 6.1.0 creates a three-level hierarchy (EmailBG->Email->Customer). Content-specific business objects do not have a wrapper or business graph in the most current release of the adapter.

When using business objects created with version 6.0.2 of the adapter, you must select the Email data binding in the external service wizard. For more information on the Email data binding, see the section devoted to outbound or inbound data transformation in this documentation.

If artifacts are inconsistent with regard to *versioning* within a single module, this module in its entirety will be marked as such, will not be selectable for migration. Version inconsistencies are recorded in the workspace log, as this may be a symptom of project corruption.

Deciding whether to upgrade or to upgrade and migrate

The default processing of the migration wizard is to perform an upgrade of the adapter and to migrate the application artifacts so that the applications can utilize features and functions in version 6.1.0 of the adapter. When you choose to upgrade the connector by selecting a connector project, the wizard automatically selects the associated artifacts for migration.

If you decide that you want to upgrade the adapter from version version 6.0.2 to version 6.1.0, but you do not want to migrate the adapter artifacts, you can do so by deselecting the adapter artifacts from the appropriate page of the migration wizard.

Running the migration wizard without any adapter artifacts selected will install and upgrade your adapter, but your artifacts are not migrated and your applications will not be able to take advantage of the features and capabilities that exist in version 6.1.0 of the adapter.

Run the migration wizard in a test environment first

Because adapter migration may require you to make changes to those applications that will utilize version 6.1.0 of WebSphere Adapter for Email, you should always perform the migration in a development environment first and test your applications before deploying the application to a production environment.

The migration wizard is fully integrated with the development environment.

Performing the migration

You can migrate a project or EAR file using the version 6.1.0, use the adapter migration wizard. When the tool is finished, the migration is complete and you can work in the project or deploy the module.

Before you begin

Review the information in *Migration considerations*.

About this task

To perform the migration in WebSphere Integration Developer, complete the following steps.

Note: After migration is complete, the module will no longer be compatible with previous versions of WebSphere Process Server, WebSphere Enterprise Service Bus, or WebSphere Integration Developer.

Note: The following steps describe how to run the adapter migration wizard from the connector project context menu while in the J2EE perspective in WebSphere Integration Developer.

Note: You can also migrate in one of the following ways:

- Right-click the project in the J2EE perspective and select **Migrate → Migrate project**.
- From the Problems view, right-click a migration-specific message and select **Quick Fix** to correct the problem.

Procedure

1. Import the PI (project interchange) file for an existing project or the EAR (enterprise archive) file for an deployed application into the workspace.
2. Change to the J2EE perspective.
3. Right-click the module and select **Migrate → Update Connector Project**.
4. Review the tasks and warnings presented on the welcome page, and then select **Next**.
5. On the Select Projects window, select **Next**.

   By default, the wizard migrates the connector project and any dependent projects. If your project has dependent projects and you do not want to migrate one or more of them at this time, clear their check boxes in the **Dependent adapter project** list. You can rerun the wizard to migrate the dependent project at a later time. Previously migrated projects, projects with a current version, and projects that contain errors are unavailable for migration and are not selected.
6. On the Adapter Migration window, optionally review the migration changes, but do not change any selections. Click **Finish**.
7. Check the Problems view for messages from the migration wizard, which start with the string CWPAD.
8. If you are migrating an EAR file, optionally create a new EAR file with the migrated adapter and artifacts, and deploy it to WebSphere Process Server or WebSphere Enterprise Service Bus. For more information about exporting and deploying an EAR file, see the topics devoted to it in this documentation.

Results

The project or EAR file is migrated to version 6.1.0. You do not need to run the external service wizard after exiting the adapter migration wizard.

Updating but not migrating a version 6.0.2 project

Before you can use a version 6.0.2 project, without migrating the complete project, with WebSphere Adapter for Email, version 6.1.0 in WebSphere Integration Developer, version 6.1.0, use the migration wizard to update the project, and then correct a problem.

About this task

Because the internal name of the adapter changed in version 6.1.0, artifacts in a version 6.0.2 project must be updated to use the new name before you can use the adapter wizard in WebSphere Integration Developer, version 6.1.0. Use the migration wizard to update a version 6.0.2 project. Then use the Quick Fix feature of WebSphere Integration Developer to change the adapter name in project artifacts.

Procedure

1. Import the project interchange (PI) file into the workspace.
2. In the J2EE perspective, right-click the project name and click **Migrate → Update Connector Project**. The adapter migration wizard opens.
3. On the welcome page, click **Next**.
4. On the Select Projects window, select none of the dependent artifact projects, and then click **Finish**.
5. In the Quick Fix window, make sure the fix **Rename the referenced adapter** is selected, and then click **OK**.
6. If the error remains visible, click **Project → Clean**, select the project you just updated, and then click **OK**.

Results

The project can now be used with WebSphere Adapter for Email, version 6.1.0.

Chapter 3. Samples and tutorials

The WebSphere Integration Developer online samples/tutorials gallery includes samples and tutorials to help you use WebSphere Adapters.

You can access the online samples/tutorials gallery as follows:

- From the welcome page that opens when you start WebSphere Integration Developer. To see samples and tutorials for WebSphere Adapter for Email, 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.

Chapter 4. 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. You then specify the business objects you want to build and the system on which you want to build them. After completing these steps, you will have successfully created an external service.

Roadmap for configuring the module

Before you can use WebSphere Adapter for Email in a runtime environment, you must configure the module. Understanding this task at a high level helps you perform the steps that are needed to accomplish the task.

You configure the module for WebSphere Adapter for Email by using WebSphere Integration Developer. The following figure illustrates the flow of the configuration task, and the steps that follow the figure describe this task at a high level only. For the details about how to perform each of these steps, see the topics following this roadmap.

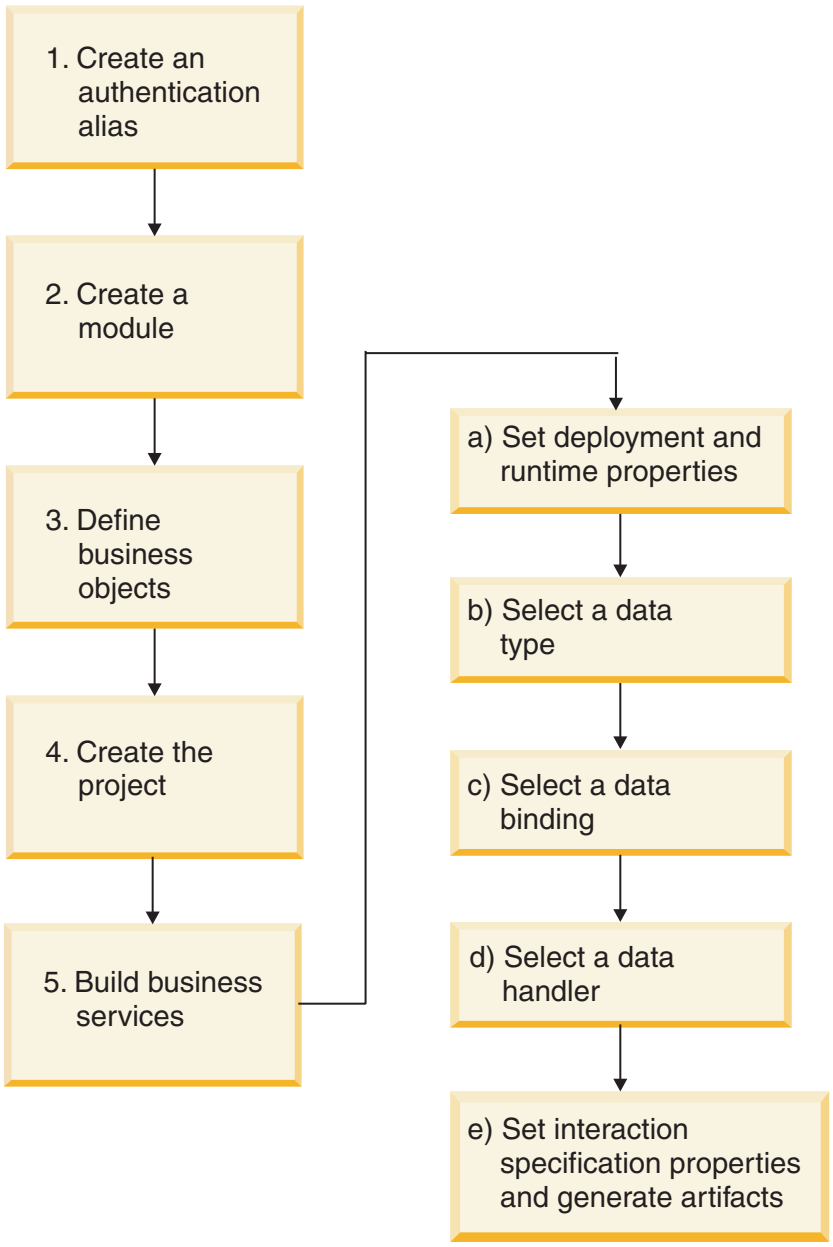


Figure 9. Task roadmap for the Email adapter

Configuring the module

This task consists of the following steps, which are described at a high level.

Note: These steps assume that you are using user-defined business objects that require data transformation. If you are using generic business objects, which do not require data transformation, some of the following steps will be ignored. For example, you will not need to select a data binding and a data handler.

1. Create an authentication alias to access the mail server. Perform this step using the administrative console on the server.
2. Create a module in WebSphere Integration Developer. You create business objects in the module.
3. Define the business objects that will be used by the project.

4. Create a project, which is used to organize the files associated with the adapter using the external service wizard in WebSphere Integration Developer.
5. Build business services by running the external service wizard from WebSphere Integration Developer, then performing the following steps:
   a. Specify the following deployment and runtime properties:
      - Connection properties
      - Security properties
      - Deployment options
      - Function selector - Inbound only
   b. Select a data type and name the operation associated with this data type. For each operation, specify the following:
      - The operation kind. For example, Create, Append, Exists.
      - Specify if the operation is passthrough or user defined.
   c. Select the data binding. Each data type has an equivalent data binding used to read the fields in a business object and fill the corresponding fields in a file.
   d. Select the data handler that will perform the conversions between a business object and a native format.
   e. Specify interaction specification property values and generate artifacts. The output from running the external service wizard is saved to a business integration module, which contains the business object or objects, and the import or export file.

Configuring the mail server to work with the adapter

Before you begin working with the adapter, a mail server must be installed and configured according to its user manual. This is necessary because the external service wizard in WebSphere Integration Developer requires information on how to connect to the mail server (such as usernames, passwords, and port) when you create your adapter module.

Creating the authentication alias

An authentication alias is a feature that encrypts the password used by the adapter to access the mail server. After an authentication alias has been created, you can use it when you configure the adapter (instead of directly typing the user ID and password). Adapter properties are not encrypted, and if you directly type password, it is stored as clear text that can be viewed by others. Using the authentication alias is the default choice in the external service wizard.

Before you begin

To create an authentication alias, you must have access to the WebSphere Process Server or WebSphere Enterprise Service Bus administrative console. The following procedure shows you how to gain access to the administrative console through WebSphere Integration Developer.

About this task

The following procedure shows you how to gain access to the 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.

Procedure

1. Start the administrative console.

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

   a. Start WebSphere Integration Developer by clicking **Start** → **Programs** → **IBM Software Development Platform** → **IBM Websphere Integration Developer 6.1** → **IBM Websphere Integration Developer 6.1**.

   b. If you are prompted to specify a workspace, accept the default value. (The workspace is a directory where WebSphere Integration Developer stores your project.)

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

   d. Click the **Servers** tab.

   e. 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**.

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

   g. Log on to the administrative console. If your administrative console requires a user ID and password, type the ID and password and click **Log in**. If the user ID and password are not required, 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**.

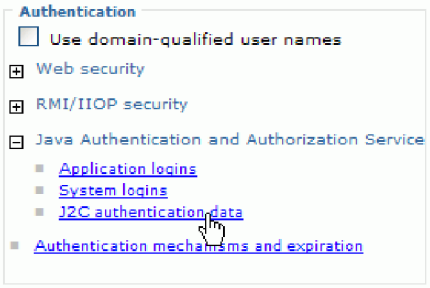


Figure 10. The Authentication section of the Secure administration, applications, and infrastructure window

4. Create an authentication alias

   a. In 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 mail server.

   d. Optionally type a description of the alias.

   e. Click **OK**.

      The newly created alias is displayed.

      Note the full name of the alias. This full name is the one you use in subsequent configuration windows.

   f. Click **Save**, and then click **Save** again.

5. Click **New**.

Results

You have created an authentication alias, which you will use when you configure the adapter properties.

Creating the module

A module encapsulates the service in a reusable unit and consists of both a project in WebSphere Integration Developer and an unit of deployment to WebSphere Process Server. The module is packaged and deployed to WebSphere Process Server 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 V6.1.0** → **WebSphere Integration Developer V6.1.0**.
   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.

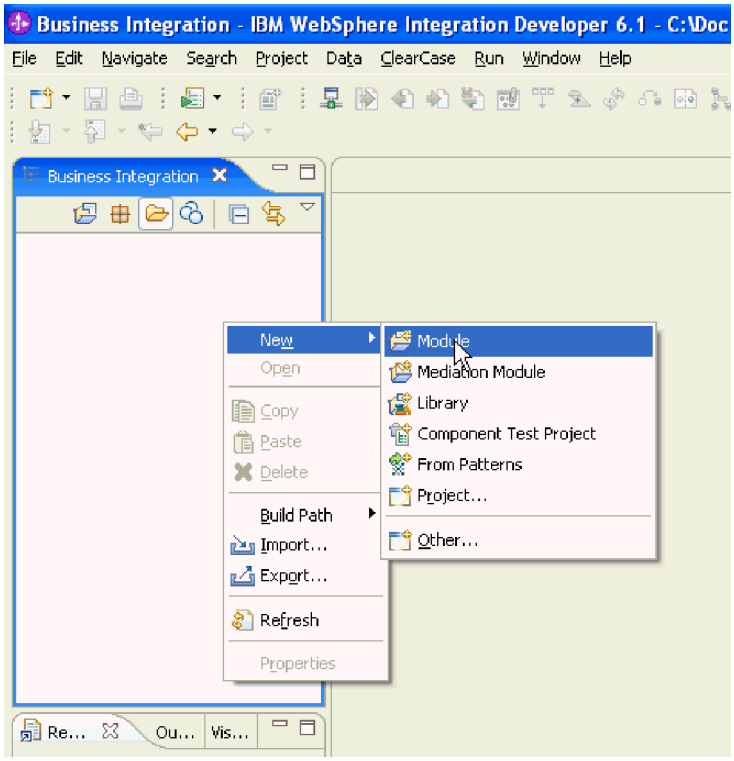


Figure 11. Business Integration section of the window

3. Type in a new **Module Name** in the New Module window.

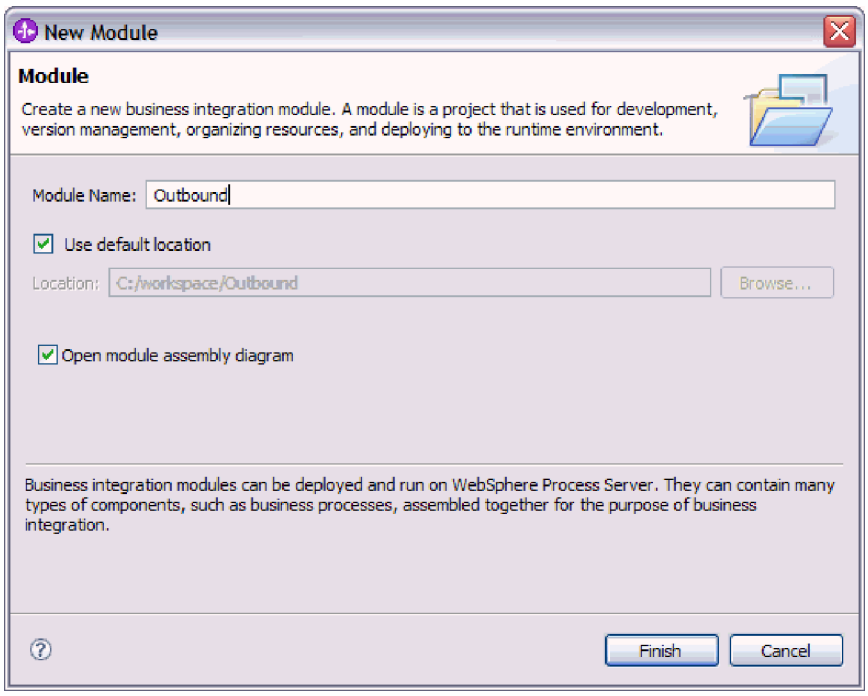


Figure 12. New Module window

4. Click **Finish**.

Results

A new module is listed in the Business Integration window.

What to do next

Define business objects for the module.

Defining business objects

Predefine or import predefined business objects using WebSphere Integration Developer that will be used by the module. WebSphere Adapter for Email uses business objects to either obtain information from an e-mail or to produce an e-mail.

About this task

To predefined new business objects using the business object editor, complete the following steps.

Note: These steps should only be used for payload business objects (such as Customer and Order) and not for top-level e-mail business objects (wrappers). Wrapper business objects are created by the external service wizard.

Procedure

1. To create new business objects, complete the following steps.
   a. Expand the new module located inside of the Business Integration section of the WebSphere Integration Developer window.
   b. Right-click the **Data Types** folder and select **New > Business Object**.

c. Type in a new **Name** in the Business Object window.
d. Click **Finish**. The new business object is added to the **Data Types** folder.
e. Click the **Add a field to a business object** icon and add the necessary fields to the business object.
f. Click the Save icon.
g. Repeat the above steps for each business object that you want to create.

2. To import predefined business objects, complete the following steps.
   a. Expand the new module located inside of the Business Integration section of the WebSphere Integration Developer window.
   b. Right-click the **Data Types** folder and select **Import**.
   c. In the Select window, expand **General** and click **File System**.
   d. Click **Next**.
   e. Browse to the directory with the XSD file and click **OK**.
   f. Select one or more business object XSD files and click **Finish**.

Results

The new business objects are defined.

What to do next

Create a project, which is used to organize the files associated with the adapter.

Creating a simple service with the adapter pattern wizard

Adapter patterns provide a quick and easy way of creating a simple service with an adapter.

Before you begin

To use the Email adapter pattern wizard, you must have already created a module for the service.

About this task

The following adapter pattern is available for the adapter for Email:

Table 4. Adapter pattern

Adapter pattern	Description
Simple outbound e-mail pattern	The ″create an outbound Email service to send mail″ pattern creates a service that will send simple e-mail messages using a mail server.

In this example, we create an outbound service that will create simple alert e-mails and send them to a mail server for distribution.

Complete the following steps to create this service with the adapter pattern wizard:

Procedure

1. Right-click the module within the **Business Integration** section of the WebSphere Integration Developer window and select **New → From Patterns**. The New From Pattern window opens.

2. Select **Create an outbound Email service to send mail** and click **Next**.

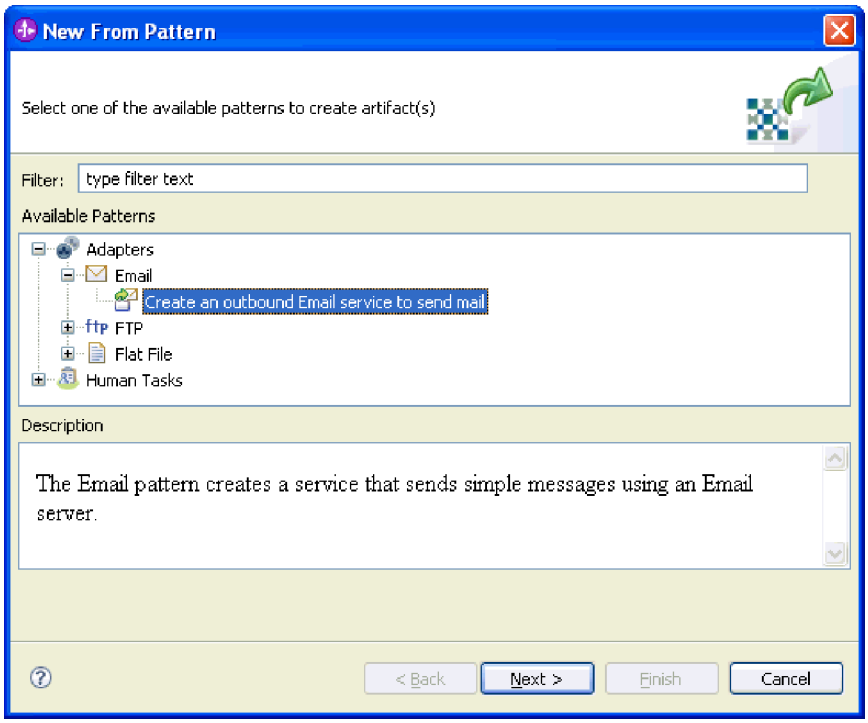


Figure 13. New From Pattern window

3. In the New Outbound Email Service window, change the name to something meaningful such as `EmailOutboundInterface` and click **Next**.

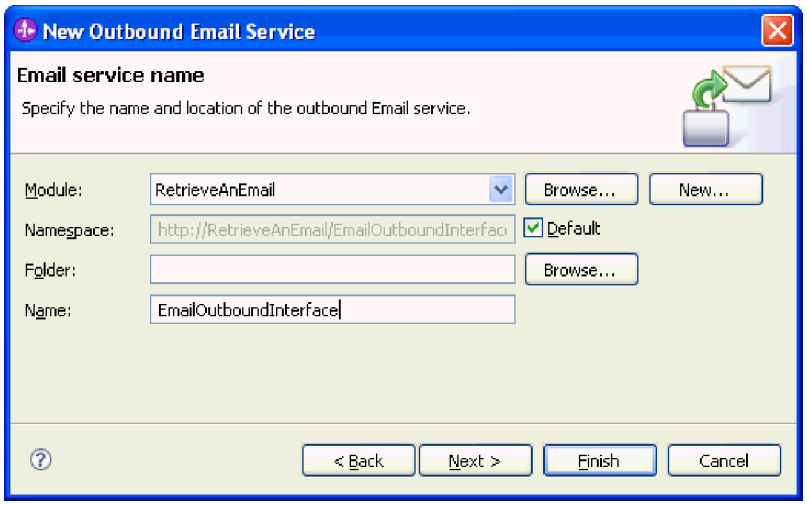


Figure 14. Email service name window

4. Specify both the **Email server host name** and the **Port** and click **Next**.

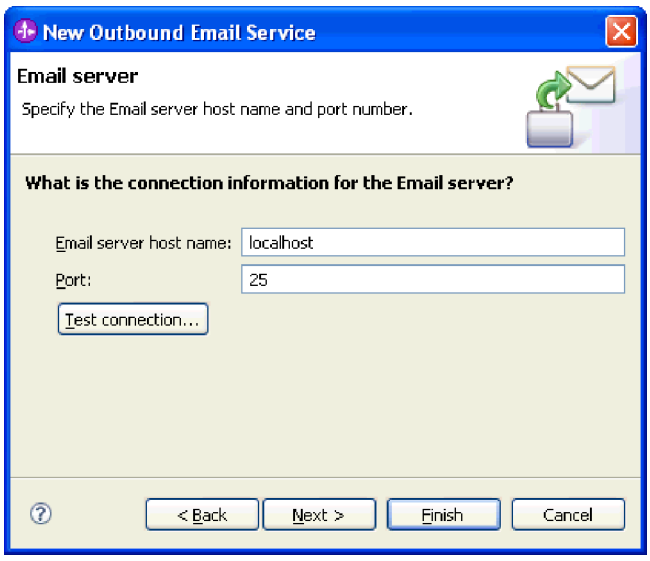


Figure 15. Connection information for the mail server window

5. In the Email server security credential window, select either **No security**, **Using an existing JAAS alias** or **Using user name and password** and click **Next**.

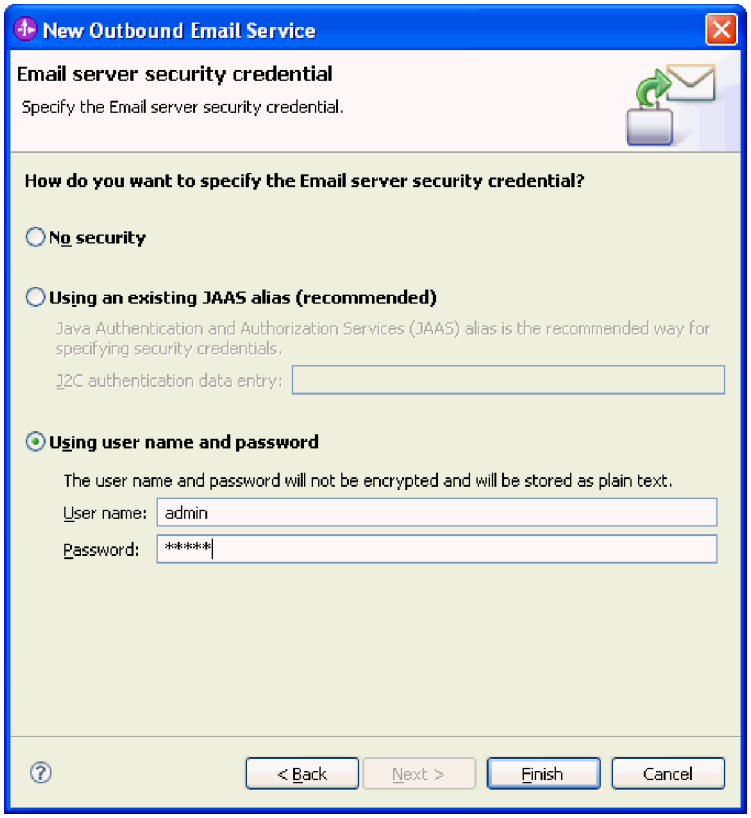


Figure 16. Email server security credential window

Results

The outbound service is created, which includes the following artifacts:

Table 5. Artifacts for the outbound service

Artifact	Name	Description
Import	EmailOutboundInterface	The import exposes the module internally, in this case, to the mail server.
Interface	EmailOutboundInterface	This interface contains the operation that can be invoked.
Operation	createEmail	createEmail is the only operation in the interface.

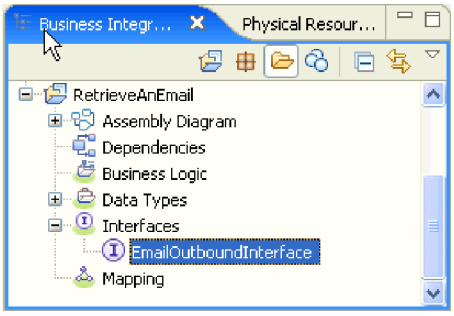


Figure 17. The **Business Integration** *section of the WebSphere Integration Developer window with the new artifacts*

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 project that is used to organize the files associated with the module.

Before you begin

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

About this task

Start the external service wizard to create a project for the adapter in WebSphere Integration Developer. If you have an existing project, you can select it instead of having the wizard create one.

To start the external service wizard and create a project, use the following procedure.

Procedure

1. If WebSphere Integration Developer is not currently running, start it now.
   a. Click **Start** → **Programs** → **IBM Software Development Platform** → **IBM Websphere Integration Developer 6.1** → **IBM Websphere Integration Developer 6.1**.

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. To start the external service wizard, click **File** → **New** → **External Service**.
3. In the New external service window, make sure **Adapters** is selected, and click **Next**.

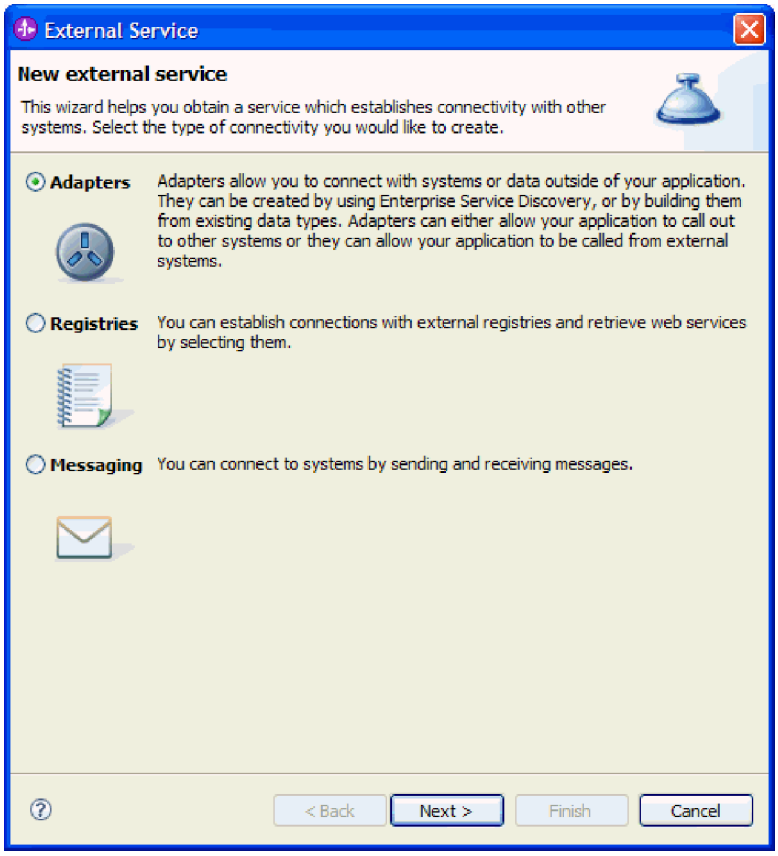


Figure 18. The New external service window

4. From the Select an Adapter window, create a project or select an existing project.
   - To create a project, perform the following steps:
     a. Select **IBM WebSphere Adapter for Email** and click **Next**.

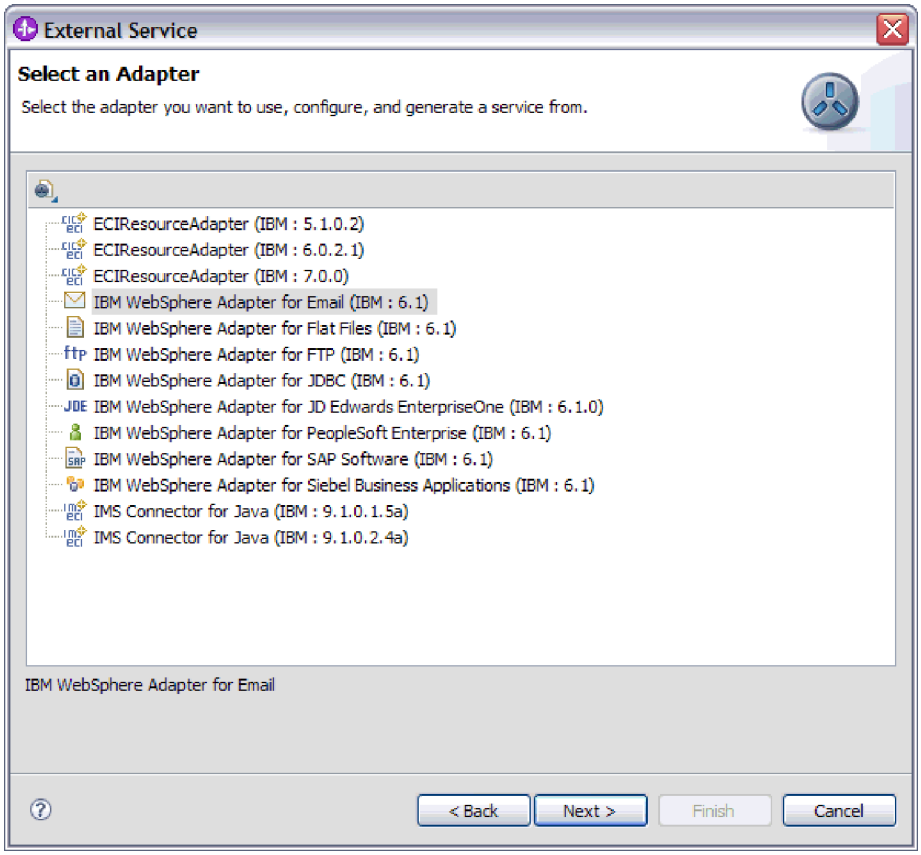


Figure 19. The Select an Enterprise Service Resource Adapter window

b. In the Connector Import window, provide another name for the project (if you want to use a name other than **CWYEM_EmailAdapter**), select the server (for example, **WebSphere Process Server v6.1**), and click **Next**.

- To select an existing project, perform the following steps:
  a. Expand **IBM WebSphere Adapter for Email**.
  b. Select a project.

     For example, if you have an existing project named CWYEM_EmailAdapter, you can expand **IBM WebSphere Adapter for Email** and select **CWYEM_EmailAdapter**, as shown in the following figure.
  c. Click **Next**.

Results

A new project is created and is listed in the Business Integration window.

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 build business services, specify data transformation processing, and generate business object definitions and related artifacts.

Setting deployment and runtime properties

Using the external service wizard in WebSphere Integration Developer, select whether your module will be used for outbound or inbound communication with the mail server. Then configure managed connection factory properties. Managed connection factory properties are stored in the business object and contain the information the adapter will need to make the connection between the outbound module and the mail server.

Before you begin

Before you can set the service configuration properties in this section, you must have created your module. It should be displayed in WebSphere Integration Developer below the adapter project. For more information about creating the adapter project, see the topic devoted to it in this documentation.

About this task

To set connection properties, follow this procedure. For more information on any of the properties in this topic, see the reference topic devoted to managed connection factory properties in this documentation.

Procedure

1. On the Processing direction window, select **Outbound** and click **Next**. The Service Configuration Properties window opens.

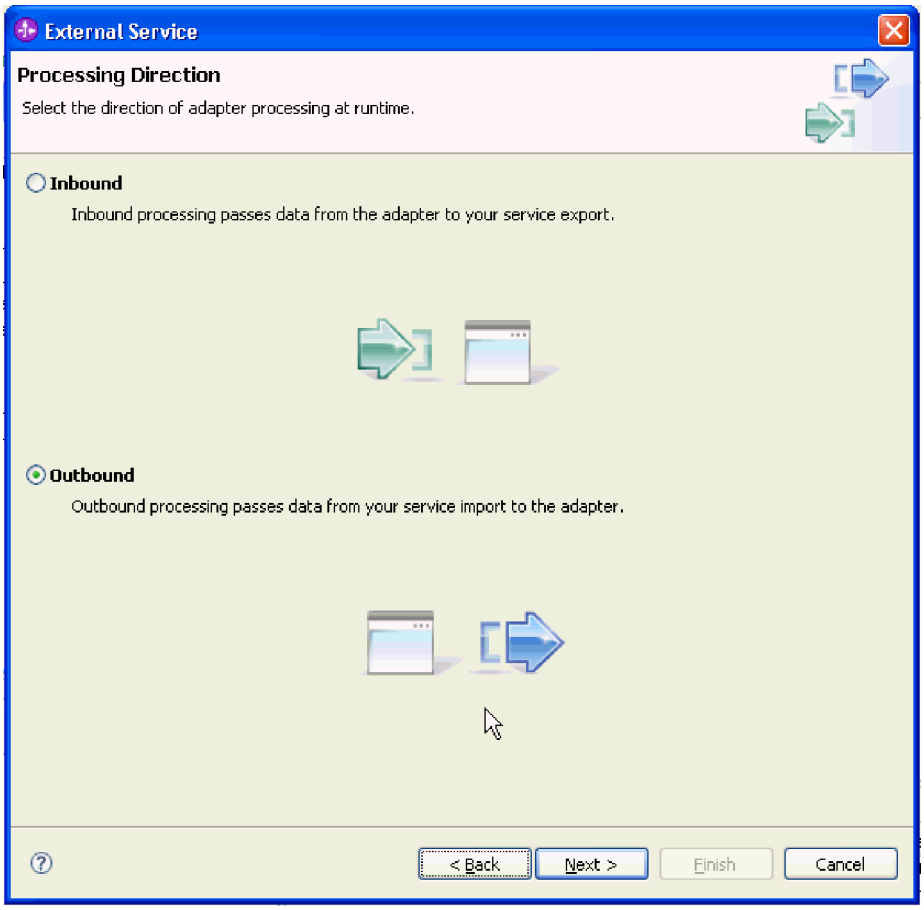


Figure 20. Choosing inbound or outbound in the external service wizard

2. In **Deploy connector project**, specify whether to include the adapter files in the module. Choose 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.
3. Under E-mail system connection information, type the **Host name**.

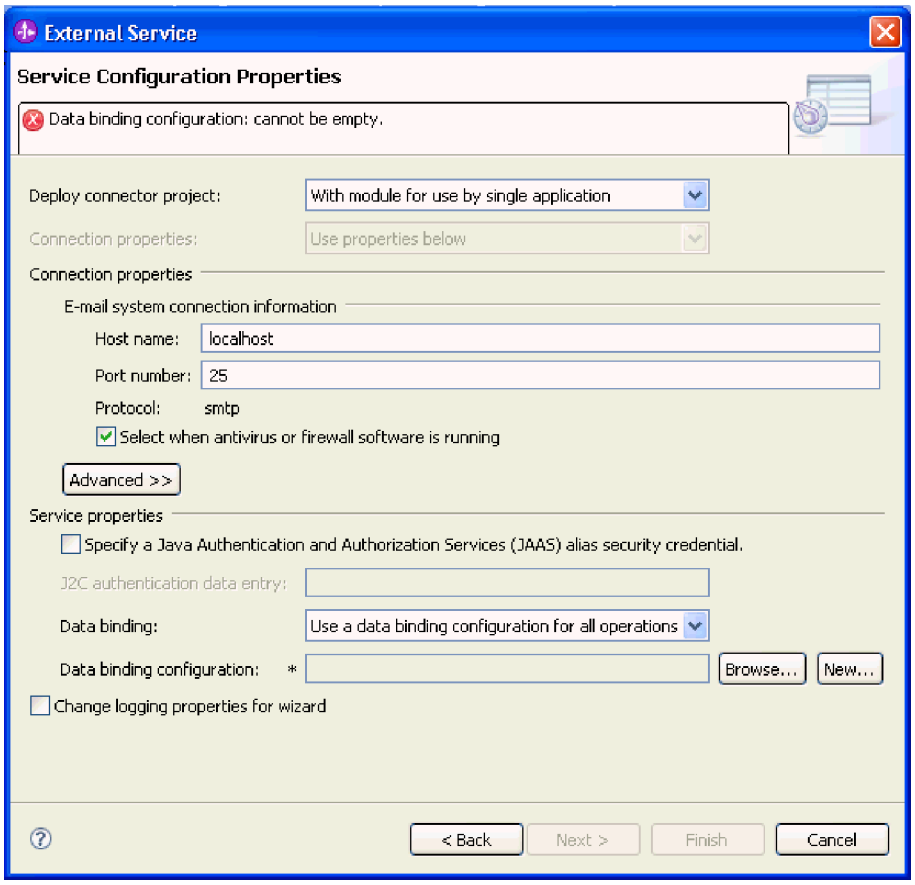


Figure 21. Service configuration properties window

   a. Under Bidi properties, type a **Bidi format string** if you want to enable this bidi property. This is the Bidi format that will be applied to all the properties that are bidi-enabled.
4. Type the **Port** number.
5. Clear the **Select when antivirus or firewall software is running** check box if you do not want the adapter to close the managed connection after each

outbound request. If an antivirus program or firewall is running on your system (the machine on which the adapter is deployed or the one that hosts the e-mail server) and this check box is cleared, the adapter might fail to send outbound e-mails. Leaving this check box selected is recommended.

6. Optional: To configure advanced properties (such as bidi-related properties, user name and password details, transport security, or logging and tracing details, click **Advanced** and expand the advanced properties, Bidi properties, or Logging and Tracing sections as needed.
   a. Optional: Type the **User name** for the mail server. If you are using an authentication alias, this value is not necessary. Also, for outbound communications this value is not required. Mail servers do not require a user name to send e-mails.
   b. Optional: Type the **Password** for the mail server. If you are using an authentication alias, this value is not necessary. Also, for outbound communications this value is not required. Mail servers do not require a password to send e-mails.
   c. Optional: Select the check box **Enable transport security (SSL)** if you want to enable Secure Socket Layers (SSL).
   d. Optional: Type a **Bidi format string** to specify a bidi format.
   e. Optional: To change the **Adapter ID to use for logging and tracing**, enter a new value. For more information about this property, see the Resource adapter properties reference topic.
7. Under Service Properties, clear the **Java Authentication and Authorization Services (JAAS) alias security credential** check box if you do not want to use an authentication alias. Authentication aliases should be configured before starting the wizard. The wizard won't create one; it just configures the module to use one if you specify it.
8. Optional: Select the **Change logging properties for wizard** check box if you want to define the level of logging for this module.

What to do next

Browse for or create a new data binding for the module.

Configuring the data binding

Data bindings read the fields in a business object and fill the corresponding fields in an e-mail. In the external service wizard, you add a data binding to your module and configure it to correspond with your data type. This way, the adapter knows how to populate the fields in an e-mail with information it receives in the business object.

Before you begin

You must have entered service configuration properties for the connection to the mail server.

About this task

To browse for or create a new data binding for the module, follow this procedure.

Note: Data bindings can be configured before running the external service wizard using WebSphere Integration Developer. To do this, select **New → Resource configuration** in WebSphere Integration Developer and complete the data binding screens described in this documentation.

Procedure

1. On the Service configuration properties window, select a value for **Data binding**. You may choose to use the data binding configuration for all operations or you may choose to specify a data binding for each operation. If you choose to use the data binding configuration for all operations, then the data binding configured here is used as the default data binding configuration for all operations you will configure. If you choose to specify a data binding for each operation, then you have to configure a data binding for each operation as explained in the following steps.
2. Choose whether the adapter should use an existing **data binding configuration** or create a new one.
   - To use an existing data binding configuration, click **Browse** and navigate to the data binding configuration.
   - If you do not have a data binding configured that you would like to use for this operation, click **New** for **Data binding configuration**.
3. If you choose to create a new **Data binding configuration**, follow these steps.
   a. On the New Data Binding Configuration window, the **Module** defaults to the module name you typed earlier in the wizard. If this is not the module that you want to create a data binding for, choose **New** to create a new module.

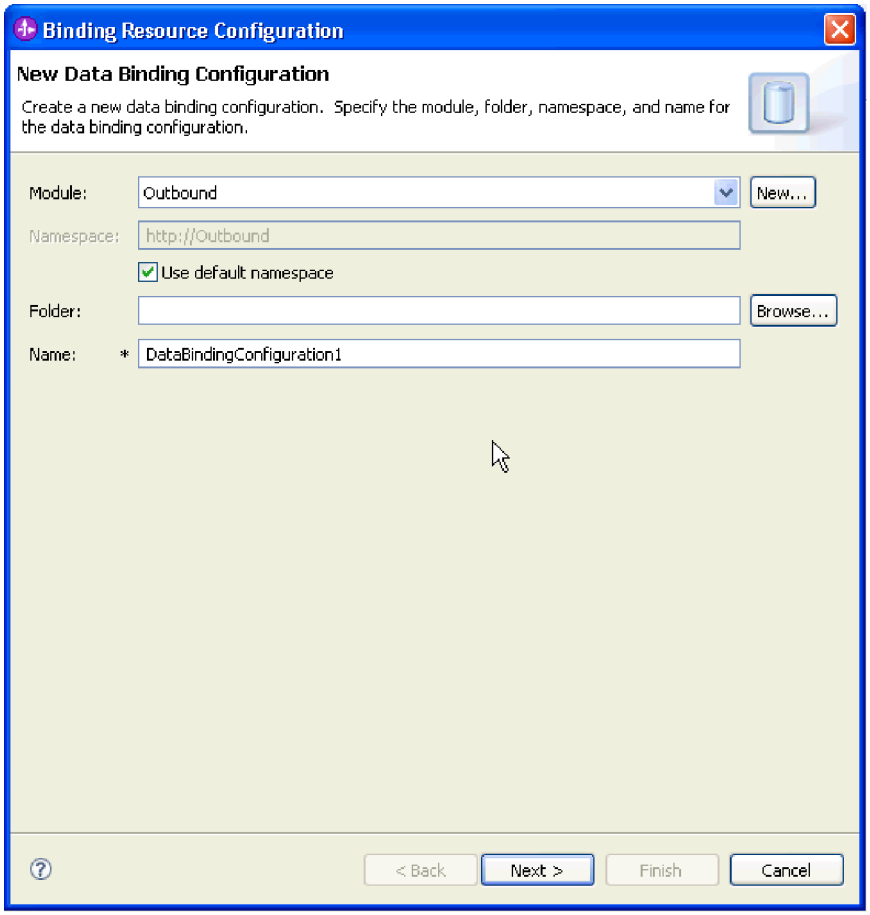


Figure 22. Naming the data binding configuration

b. If you want to choose a new folder for the artifact, click **Browse** and select a new folder location. If you do not browse for a new folder location, the artifacts will be created in the root directory for the module.

c. Type a **Name** for the data binding configuration and click **Next**.

d. Click **Next**.

4. On the Select a configuration type window, leave the **Data binding** radio button selected. The external service wizard defaults to the generic data binding used for the generic e-mail business object or generic e-mail business object with business graph data types.

5. Optional: If you plan to use the simple alert e-mail or user-defined type data types, complete the following steps to change the data binding configuration.

   a. Click **Browse** to select a Data binding class name. The term "class" here refers to the data binding class associated with the data binding you are in the process of creating for this module.

   b. On the Data Binding Selection window, leave the **Show Predefined Data Bindings** selected to use one of the data bindings included with WebSphere Integration Developer. The **Show Data Binding classes** option is available for advanced users who want to use a custom data binding. A custom data binding, once placed in the class path, will show when this radio button is selected.

   c. Select the correct data binding class for your data type and click **OK**.

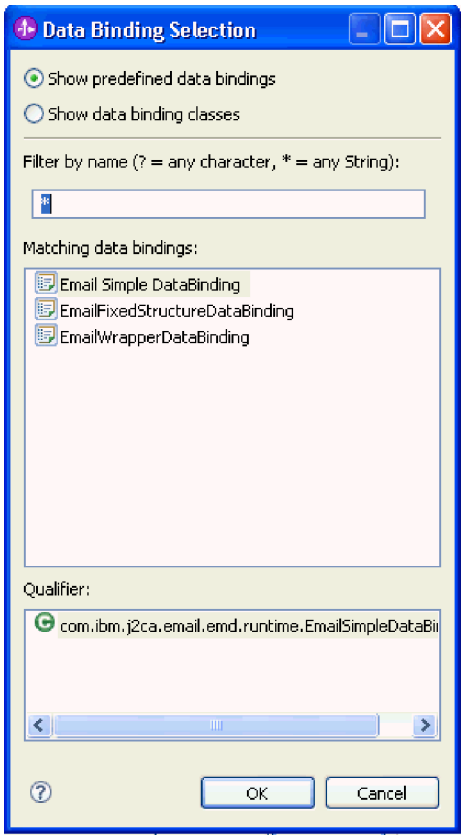


Figure 23. Selecting a data binding

The following data types should be matched up with the following data bindings.

Table 6. Data types and their data binding equivalents

Data type	Data binding
Simple e-mail	Email Simple Data Binding
Generic e-mail	Email Wrapper Data Binding
Generic e-mail with business graph	Email Wrapper Data Binding
User defined type	EmailFixedStructureDataBinding

For more information about data bindings, see the topic devoted to outbound data transformation in this documentation.

The data binding class name will populate on the Select a configuration type window.

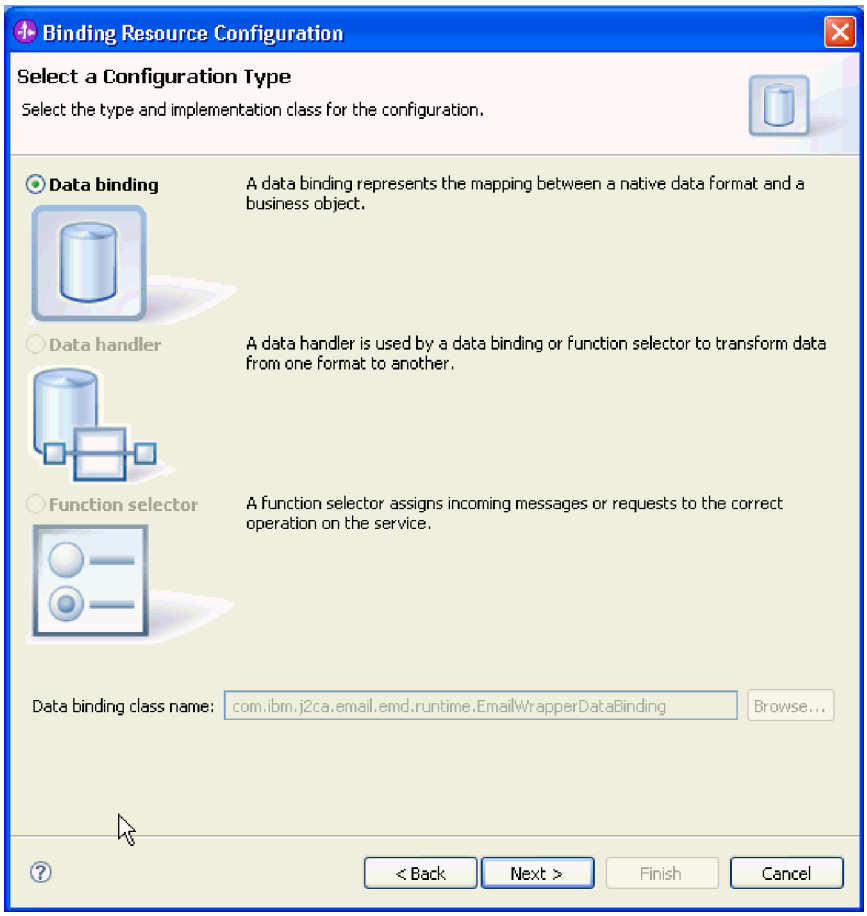


Figure 24. Data binding class is populated on the configuration type window

6. Click **Next**.

Results

A data binding is configured for use with the module.

What to do next

Specify data binding properties.

Configuring business object properties and data handlers

When you intend to use a data type that contains business objects, you need to specify properties for those business objects. Completing this step does not add child business objects to the Email parent object. Rather, they tell the adapter how to process particular types of business objects. Data handlers perform the conversions between a business object and a particular MIME format.

Before you begin

You must have created a data binding before specifying business object properties and data handlers for the module. Also, you must have predefined business objects using WebSphere Integration Developer Business Object Editor. If you stop the wizard here to create business objects, you will need to start the wizard steps from the beginning and your work will not be saved.

Note: Data handlers can be configured before running the external service wizard using WebSphere Integration Developer. To do this, select **New → Resource configuration** in WebSphere Integration Developer and complete the data handler screens described in this documentation.

About this task

You only need to define business object properties and data handlers if this module will use the generic e-mail, e-mail with business graph, or user-defined type as the data type. The simple alert Email data type does not have properties that need to be configured. To specify business object properties and data handlers, follow this procedure.

Procedure

1. If you chose the e-mail with business object, e-mail with business graph, or the user defined data type, click **Add** to add business object types to the data binding description on the Data Binding Properties screen.

   Important: If you are repeating these steps to configure a child data binding for the user defined data type, note that you cannot choose between data handler and data binding when you click on the **Edit** button. The binding type option (to choose between data binding and data handler) does not function correctly for the EmailFixedStructureDataBinding. To configure a child data binding for EmailFixedStructureDataBinding, click in the **Binding type** field and select to DataBinding. When you click **Edit** the Configured data binding option on the Add/Edit properties screen is enabled and can be used to configure a child data binding.

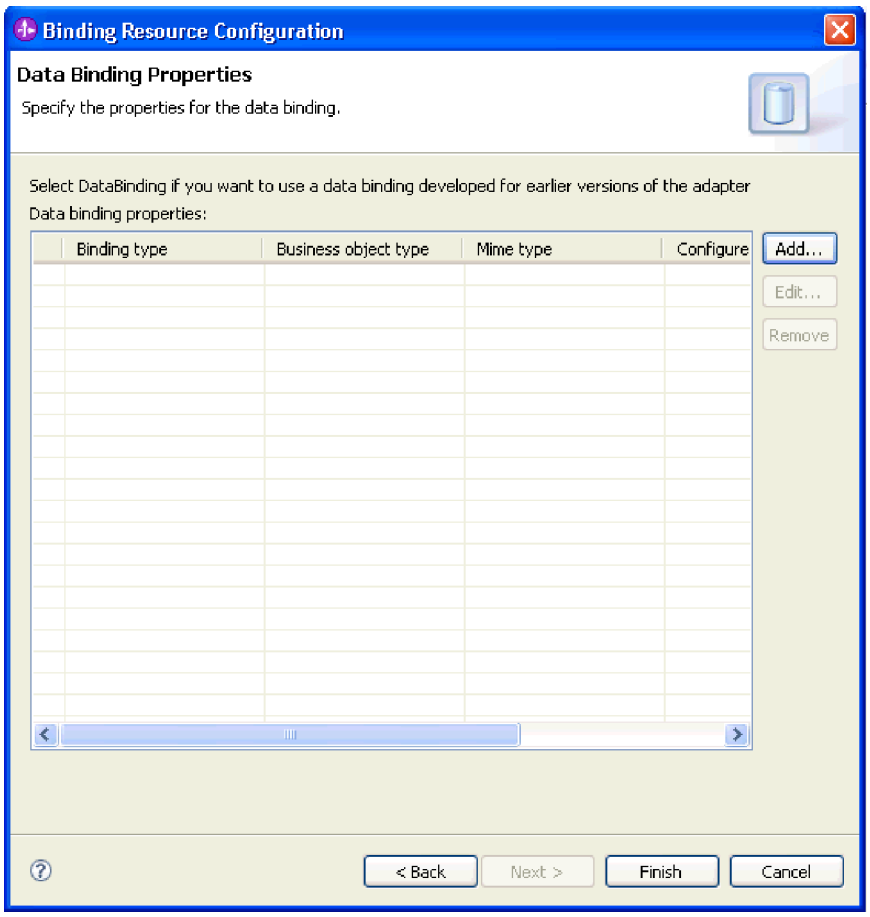


Figure 25. Adding business objects to the data binding configuration

2. **Browse** for business objects you have created on your system. These must be existing on your local system before you start the external service wizard.

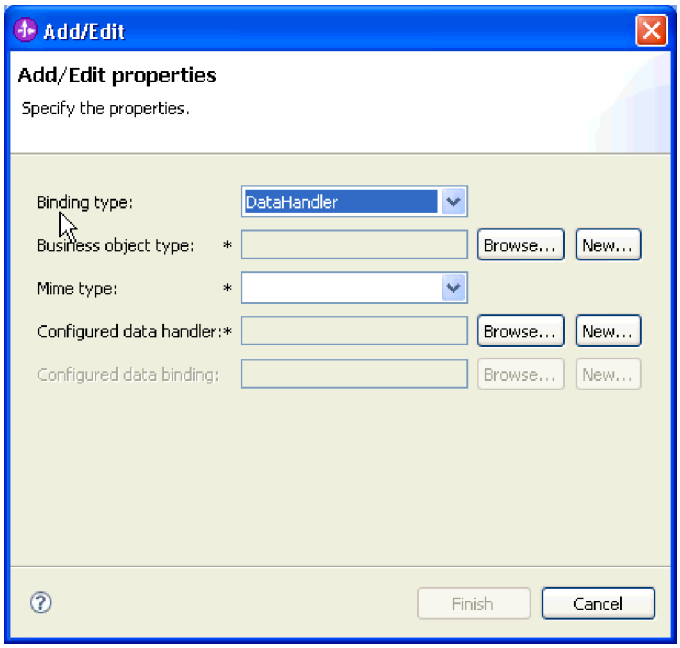


Figure 26. Adding or editing business object data binding properties

3. To select your **Business object type**, select **Browse** or **New**. Selecting business objects here does not physically add child business objects. Adding business objects at this stage in the wizard tells the adapter that you will likely use certain business object types in conjunction with your module, so it will know what data binding to apply to any child business objects it processes.
4. If you selected **Browse** for the **Business object type** field, select a **Data type** from the Data type selection options and click **OK**.
5. If you selected **New** for the **Business object type** field, complete the following steps.

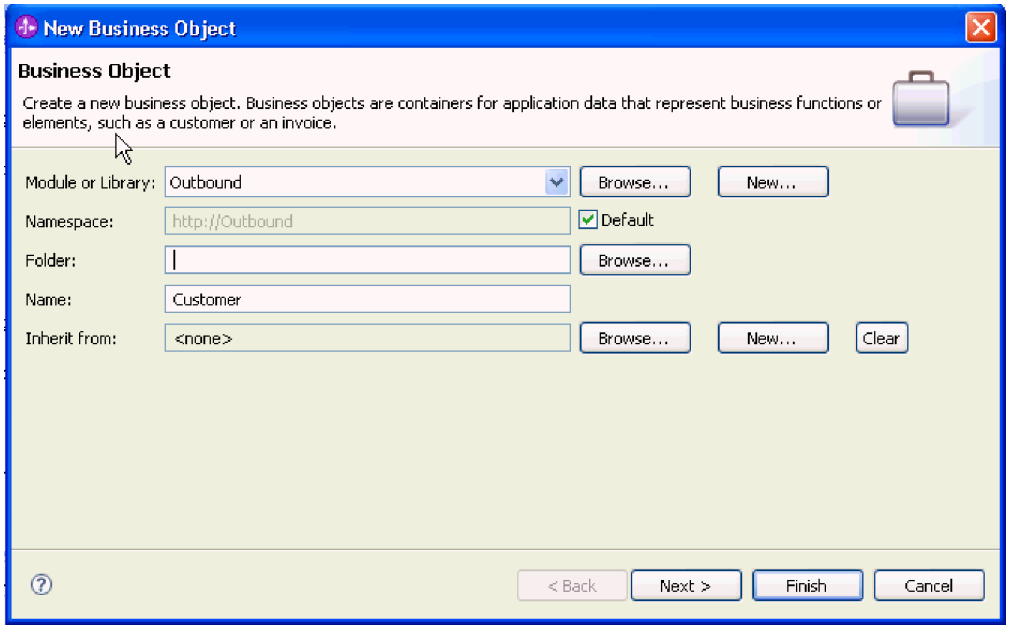


Figure 27. Specifying business object properties for the module

a. Select the **Module**. If the correct module is not shown, **Browse** for it or click **New** to create a new module.
b. Optional: Type a **Folder** name or **Browse** for the folder on your local drive where business object schema files (XSD files) generated by the external service wizard will be stored.
c. Type a **Name** for the business object.
d. If you do not want to populate the business object with fields from one or more existing business objects, click **Finish**.
e. If you want to populate the business object with fields from one or more existing business objects, click **Next**.

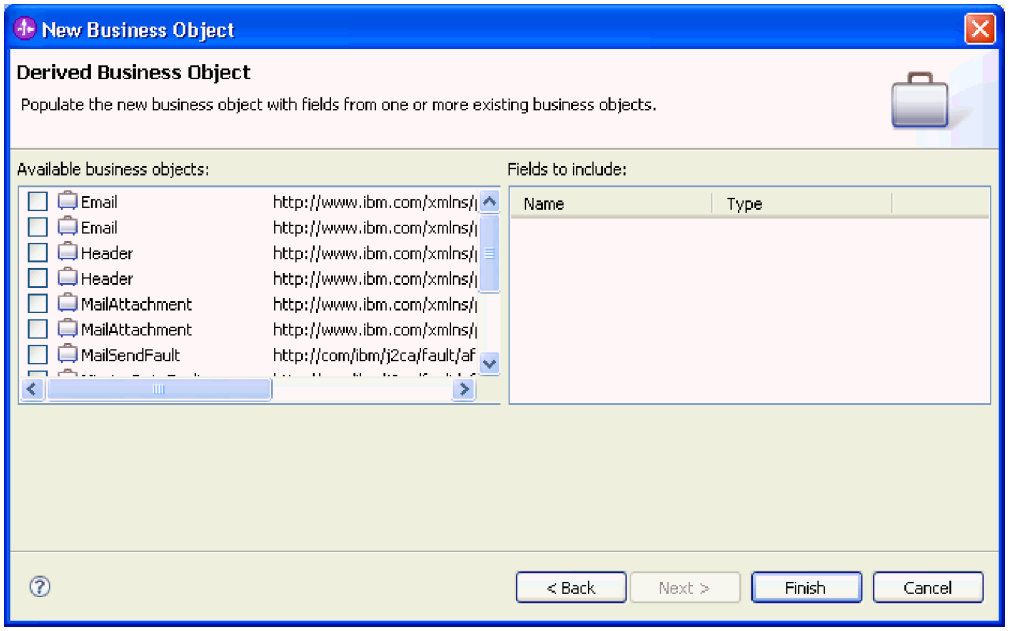


Figure 28. Deriving business object fields from an existing business object

f. Select the correct business object and click **Finish**. The **Business object type** on the Add/Edit properties window is populated.

6. On the Add/Edit window, select a mime type such as text/xml or text/html for your business object. The mime type corresponds to the data handler that is used by the adapter to perform data transformation from one format to another. This step enables the adapter to decide which format it has to convert the content to when it encounters the business object. For more information about data handlers and the mime types supported by the adapter, see the section on outbound data transformation in this documentation.
7. If you have configured a data handler already, you may **Browse** for it. Otherwise, click **New** to create a new data handler configuration. This works in conjunction with the mime type chosen in the step above.
8. If you clicked **New** to create a new data handler, complete the following steps.
   a. On the New Data Handler Configuration screen, select the module. If the correct module is not displayed, click **New** to create a new one.
   b. Optional: Type a **Folder** name if you'd like to specify a folder for the artifacts.
   c. Leave the default data handler **Name** or type a new one.

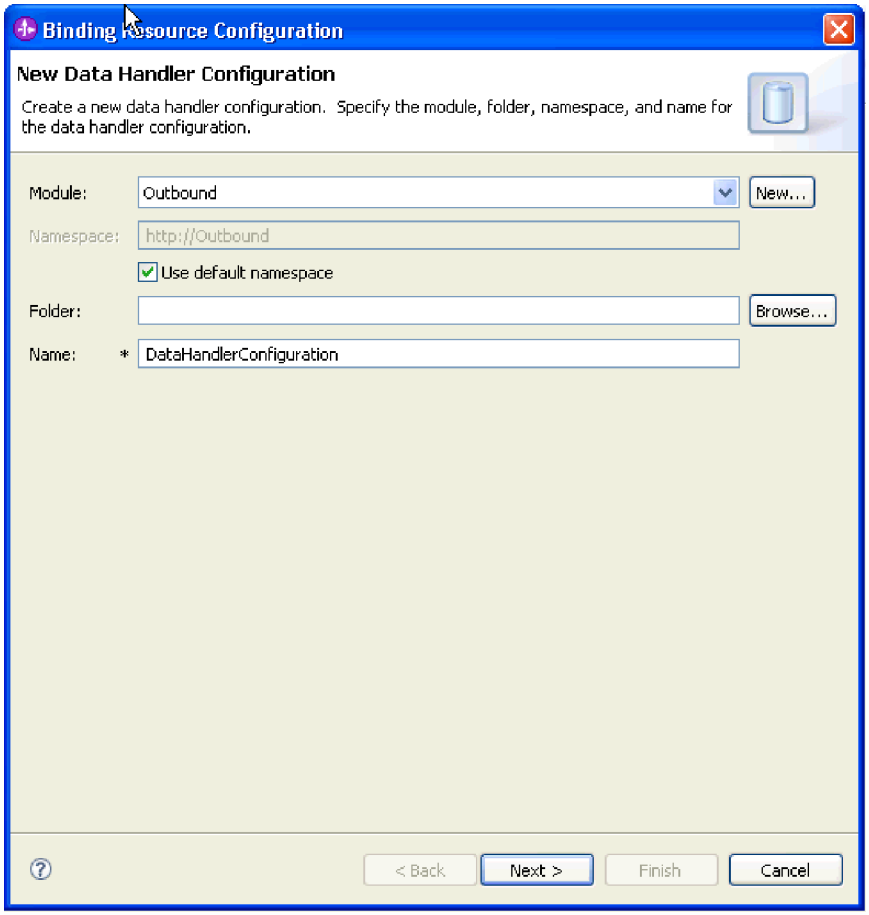


Figure 29. Creating a data handler

d. Click **Next**.

9. On the Select a configuration type window, leave the **Data Handler** radio button selected and click **Browse**.

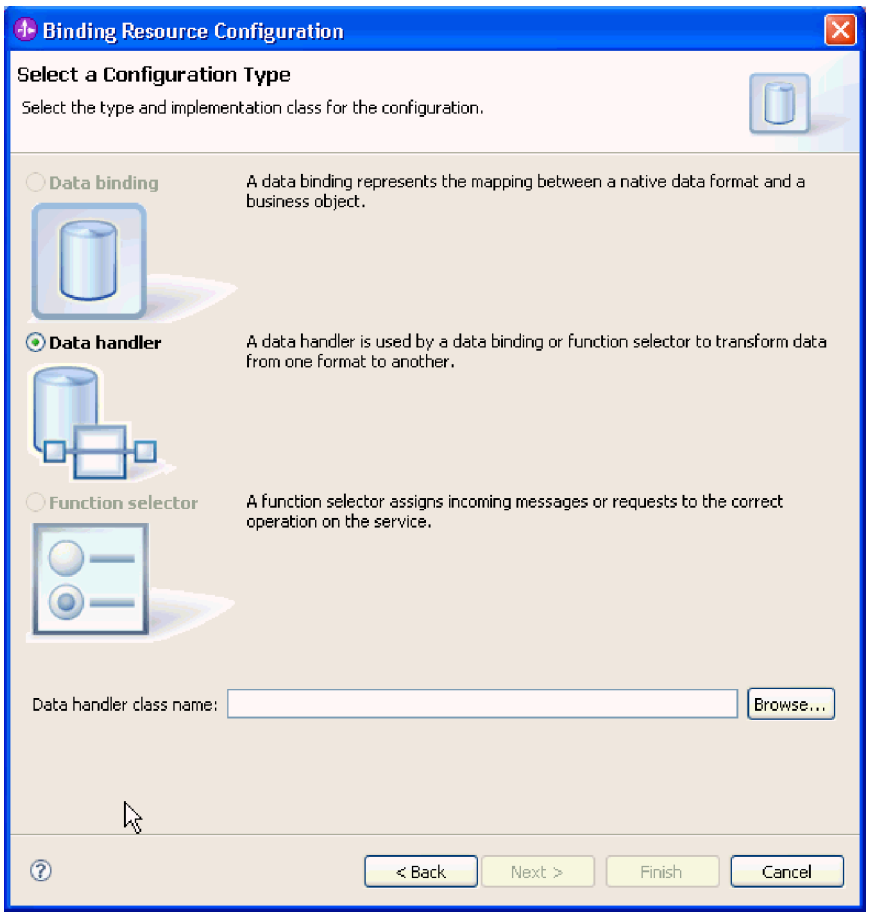


Figure 30. Choosing the data handler configuration type

10. On the Data Binding Selection window, leave **Show Predefined Data Handers** selected to use one of the data handlers included with WebSphere Integration Developer. The **Show Data Handler classes** option is available for advanced users who want to use a custom data handler. A custom data handler, once placed in the class path, will show when this radio button is selected.

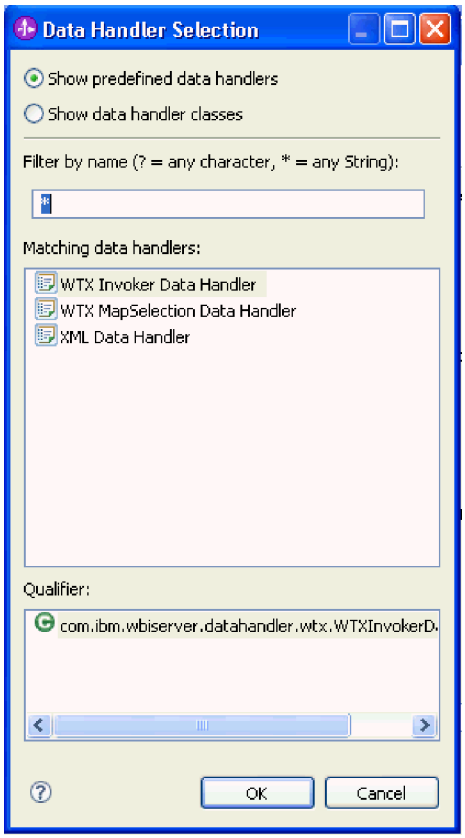


Figure 31. Selecting the data handler class

11. On the Select a configuration type window, the data handler class field is populated. Click **Next** to continue.
12. On the Specify Properties window, select an **encoding** value and then click **Finish**. This value indicates the type of character encoding the adapter will use during data transformation. For more information about the encoding property, see the reference topic devoted to Email business object properties in this documentation. The **Configured data handler** field is populated.
13. On the Add/Edit Properties window, select **Finish**.
14. Optional: If you want to add another business object type to the module, click **Add** and repeat the steps in this topic to specify business object properties and a data handler for each business object.
15. On the Data Binding Properties window, click **Finish**. The **Data biding configuration** field on the Service Configuration Properties window is populated.
16. On the Service Configuration Properties window, click **Next**.

Results

Business object properties and their data handlers are created.

What to do next

Specify an operation and a data type for the module.

Selecting a data type and operation name

Use the external service wizard to select a data type and name the operation associated with this data type. For outbound communications, the external service wizard gives you the choice of four different data types: simple e-mail, generic e-mail, generic e-mail with business graph, and user defined type. Each data type corresponds to a business object structure.

Before you begin

You must have specified the connection properties for the adapter to connect to the mail server, data bindings, and data handlers before you can specify the operation and data type for the module.

About this task

To select a data type and name the operation associated with it, follow this procedure.

Procedure

1. On the Operations window, click **Add**.

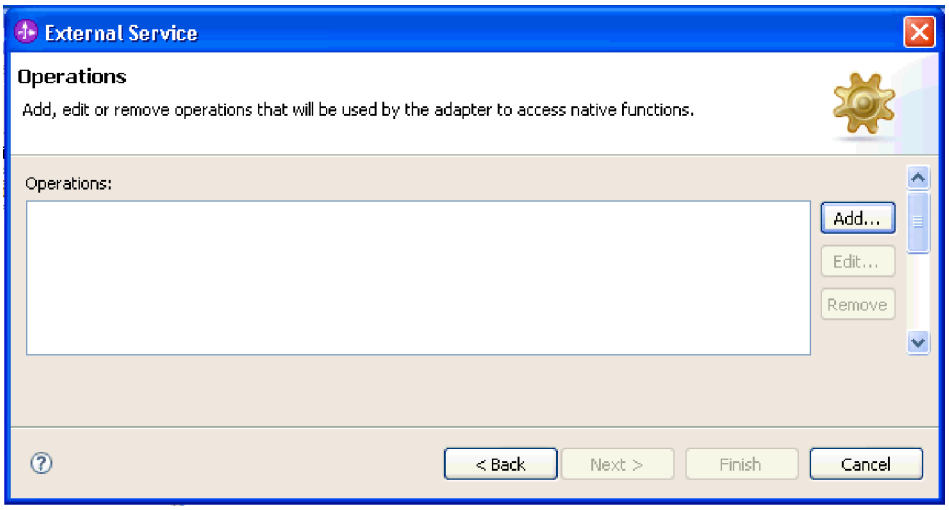


Figure 32. Adding an operation

2. On the Add Operations window, select a data type and click **Next**.

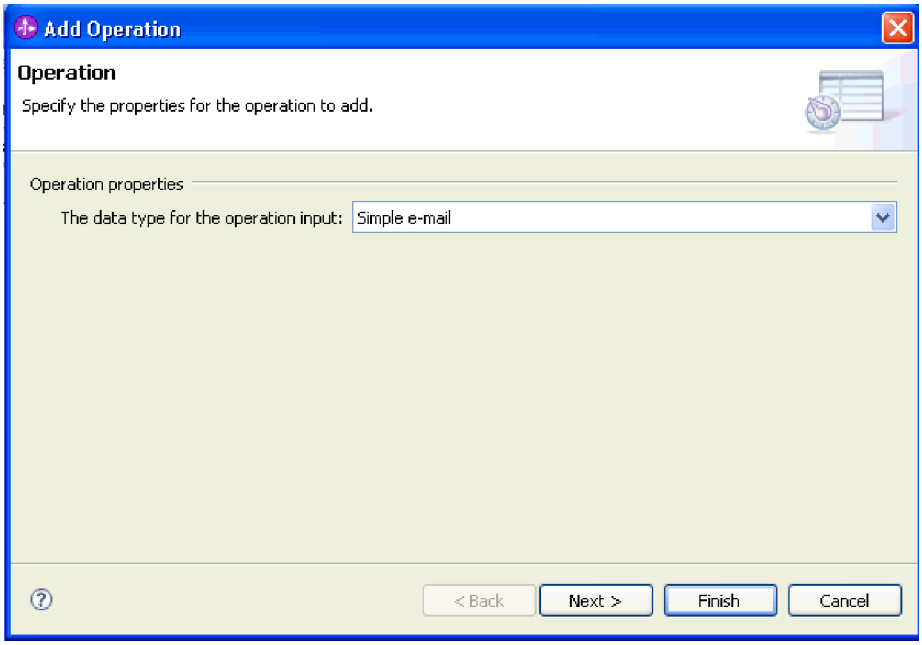


Figure 33. Selecting a data type

For more information about data types and what types of e-mails they are used to produce, see the section devoted to business object structures in this documentation.

3. On the Add Operation screen, type an **Operation name**.

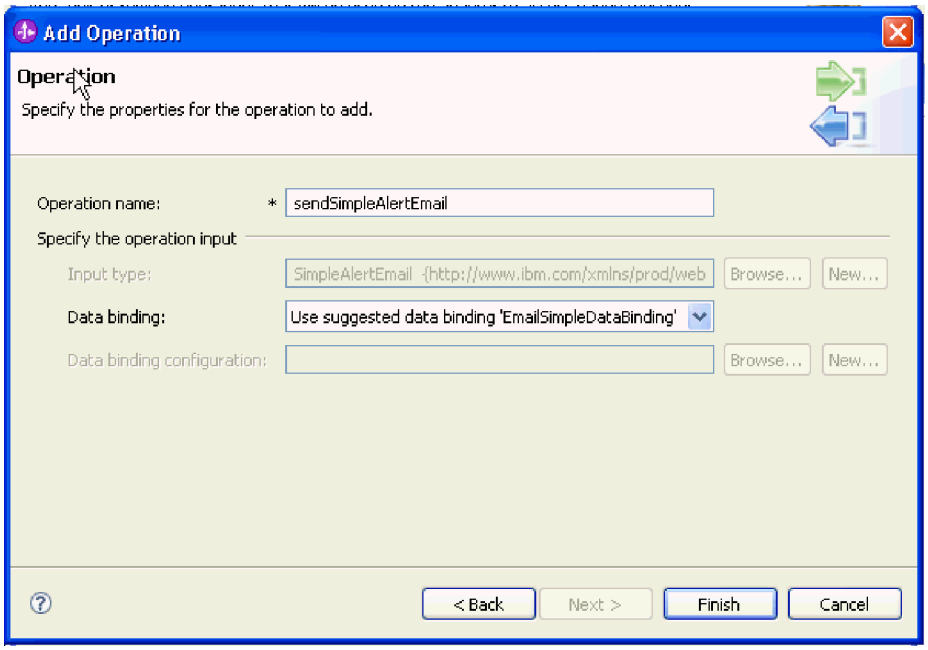


Figure 34. Naming the operation

Name the operation something meaningful. If this module is going to be used to send simple alert e-mails, name it something like SendSimpleEmail. Or, if it's going to be used to create and send e-mails constructed using information supplied in customer business objects, name it something like

SendCustomerEmail. For more information about the types of operations the adapter can perform, see the topic on Supported Operations in this documentation.

Note: Names cannot contain spaces.

4. The external service wizard will default to the correct data binding for the data type you selected on the Operation window. If you want to use a different data binding, **Browse** for a data binding or create a new one using the instructions in the sections ″Configuring the data binding″ and ″Configuring business object properties and data handlers.″
5. Click **Finish**.

Results

A data type is defined for the module and the operation associated with this data type is named.

What to do next

Specify interaction specification properties and generate artifacts for the module.

Setting interaction specification properties and generating the service

Interaction properties are optional. If you choose to set them, the values you specify are displayed in the import file. The import file is generated when the adapter creates artifacts for the module and contains the operation for the top level business object.

Before you begin

To set interaction specification properties and generate artifacts for your module, you must have already configured data bindings and selected business objects.

About this task

Interaction specification properties do not take precedence over request business object attributes, with the exception of the user name and password properties. User name and password values specified in the interaction specification properties take more precedence over values set in the managed connection factory properties. To set interaction specification properties and generate artifacts, follow this procedure. For more information about interaction specification properties, see the reference topic devoted to it in this documentation.

Procedure

1. Optional: To set interaction specification properties complete these steps:
   a. Click **Advanced**.

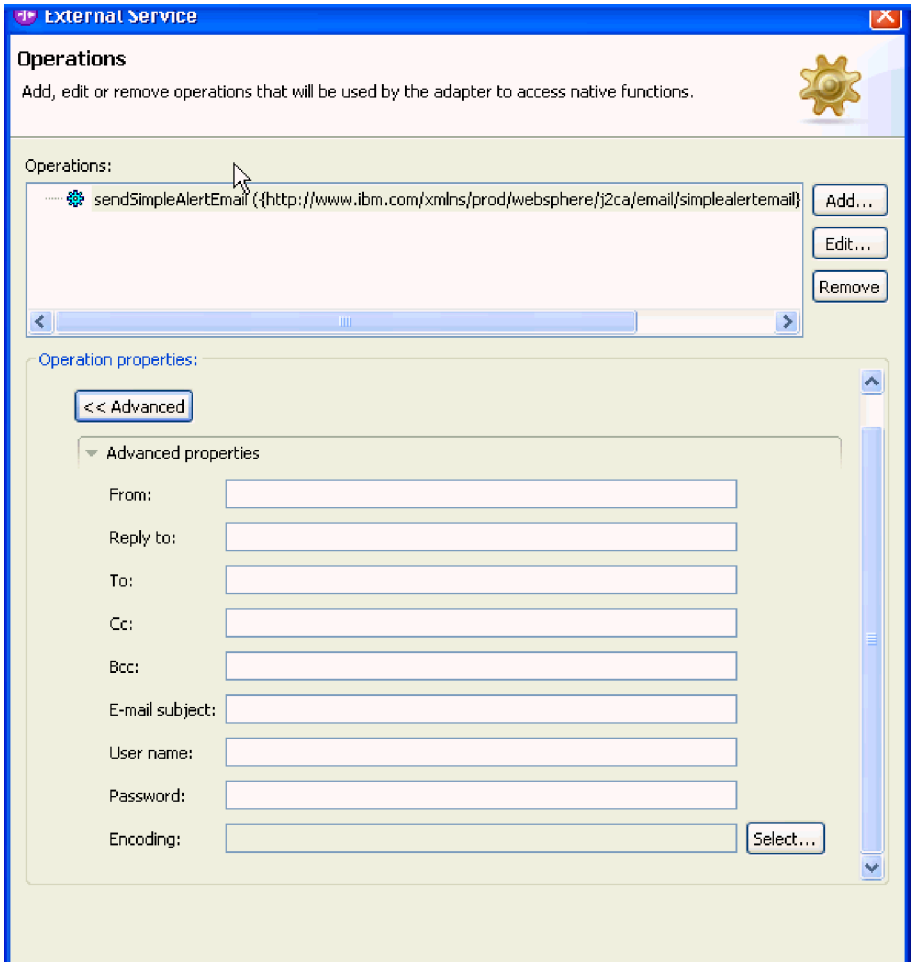


Figure 35. Setting interaction specification properties

b. Type values for any fields you want to set as defaults.
c. Click **Next**.

2. On the Generate Service window, select the **Module**.

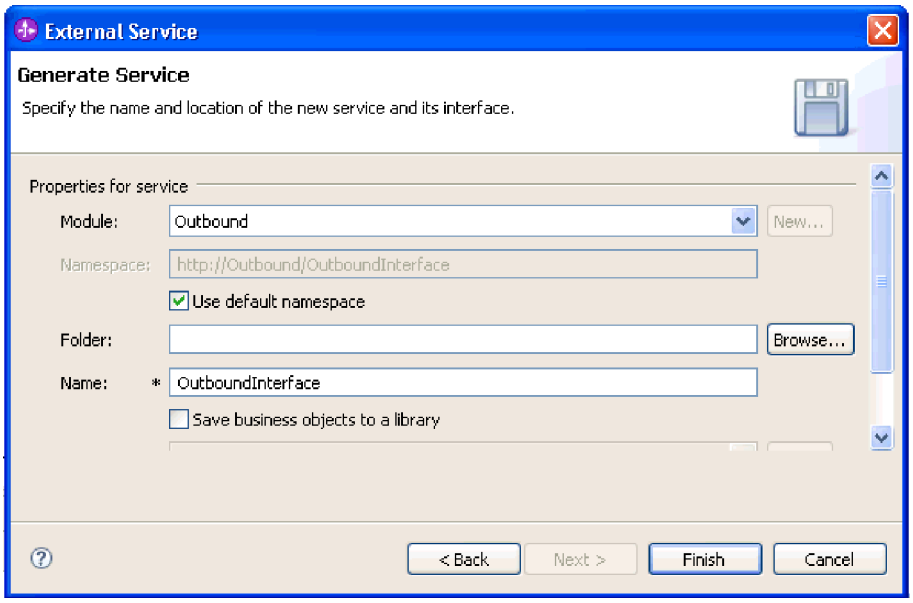


Figure 36. Naming the artifact

3. Optional: Name the **Folder** that will be used to store the artifacts.
4. Type a **Name** for the interface. This is the name that will display in the WebSphere Integration Developer assembly diagram.
5. Optional: Type a **Description**.
6. Click **Finish**. The WebSphere Integration Developer assembly diagram opens and the interface you created is displayed.

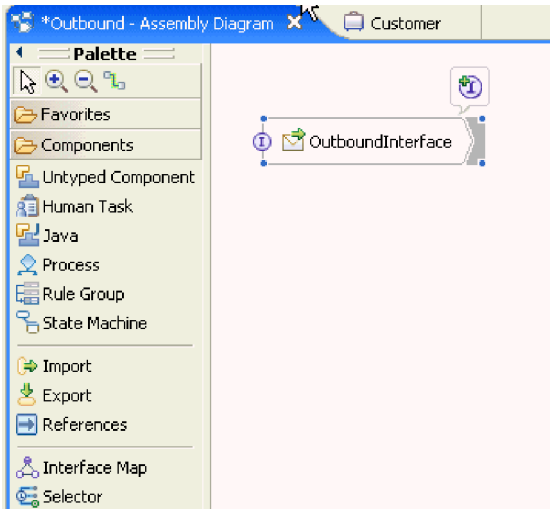


Figure 37. Interface in WebSphere Integration Developer

The business object you created is also displayed in a different tab.

Results

WebSphere Integration Developer generates the artifacts and an import. The outbound artifacts that are created are visible in the WebSphere Integration Developer Project Explorer under your module.

What to do next

Deploy the module for either testing or production.

Configuring the module for inbound processing

To configure a module to use the adapter for inbound processing, use the external service wizard in WebSphere Integration Developer to build business services, specify data transformation processing, and generate business object definitions and related artifacts.

Setting deployment and runtime properties

Using the external service wizard in WebSphere Integration Developer, select whether your module will be used for outbound or inbound communication with the mail server. Then configure connection properties. Connection properties are stored in the business object and contain the information the adapter will need to make the connection between the inbound module and service using the module.

Before you begin

Before you can set the connection properties in this section, you must have created your module in WebSphere Integration Developer. It should be displayed in the Business Integration pane below the adapter project. For more information about creating the adapter project, see the topic devoted to it in this documentation. Also, you must have created a staging directory on your local system for storing e-mails that have been polled by the adapter, but which have not yet been turned into business objects.

About this task

To set connection properties, follow this procedure. For more information on any of the properties in this topic, see the reference topic devoted to activation specification properties in this documentation.

Procedure

1. On the Processing Direction window, select **Inbound** and click **Next**.

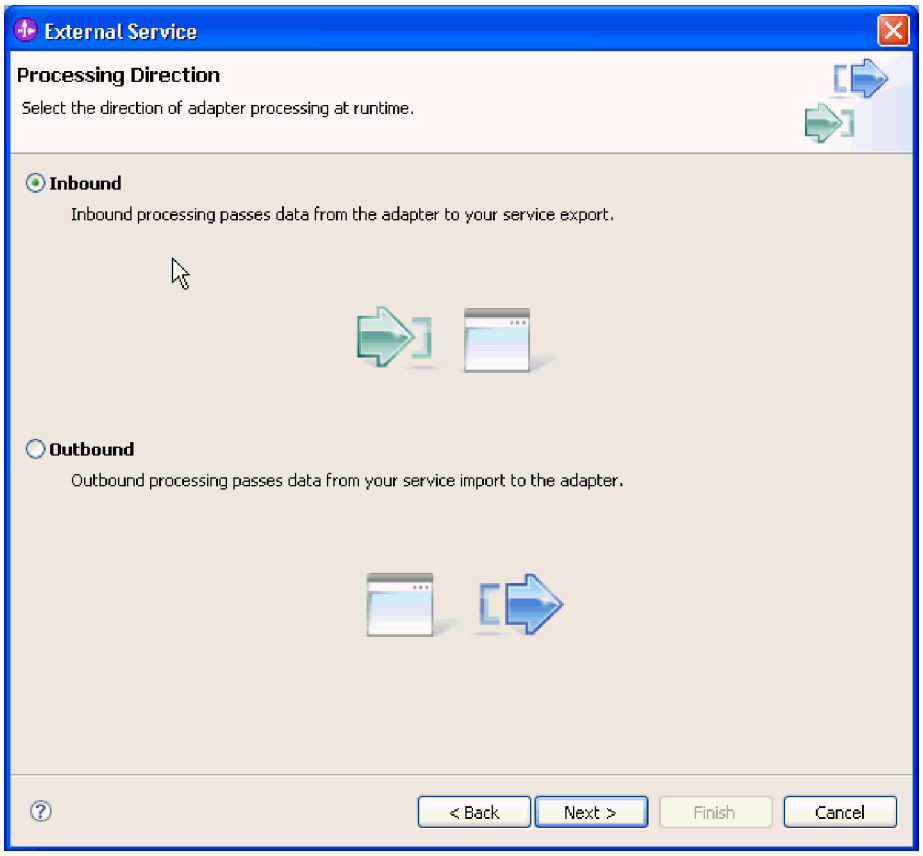


Figure 38. Choosing inbound or outbound in the external service wizard

The Service Configuration Properties window opens.

2. In **Deploy connector project**, specify whether to include the adapter files in the module. Choose 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.

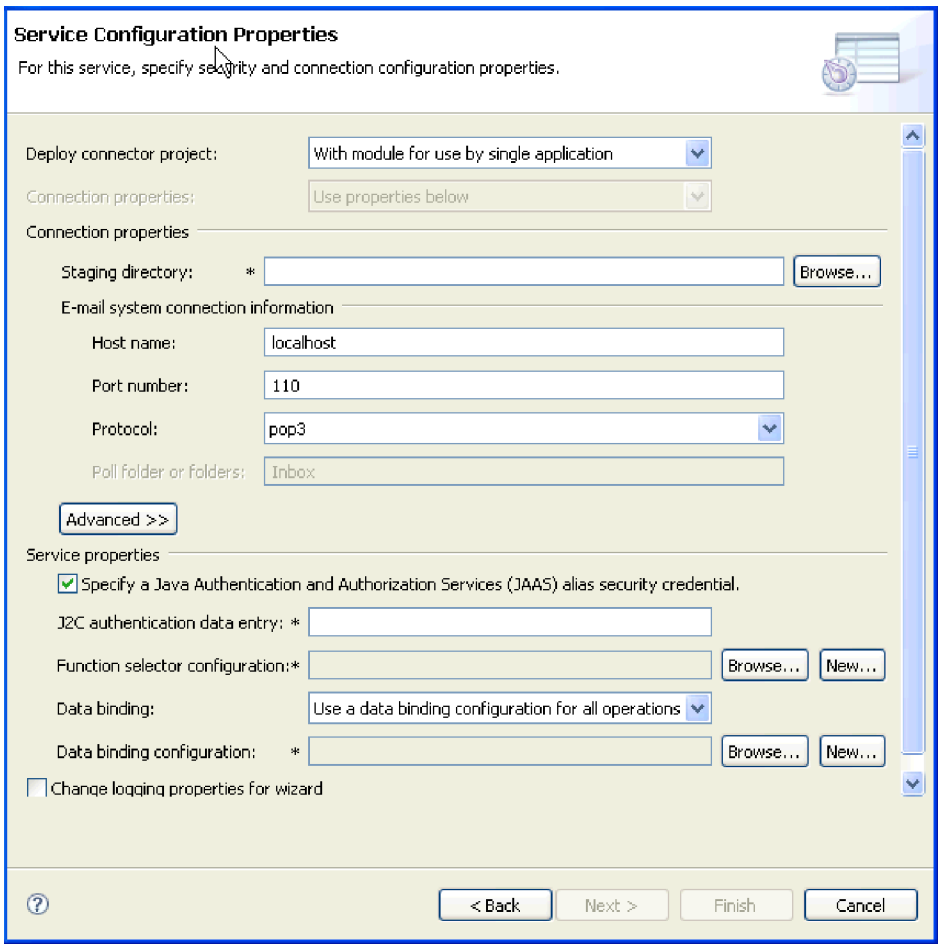


Figure 39. Specifying inbound connection properties

3. Browse for the **Staging Directory** you created on your local system. If you have not already created a staging directory, create one and then restart the external service wizard.
4. Define the Connection properties for your module. For more details on the properties found on this window, see the reference topic devoted to managed connection factory properties in this documentation.
   a. Under E-mail system connection information, type the **Host name**.
   b. Type the **Port** number.
   c. Optional: Select the e-mail **Protocol**. For more information about the pop3 and IMAP e-mail protocols, see the section devoted to inbound processing in this documentation.
5. If you want to specify advanced properties, click **Advanced** and specify values as needed. Advanced properties include activation specification properties designed to alter the default behavior of the adapter during inbound communications. Below, a few of the most common advanced properties are described. However, for more information about any of the advanced properties for event polling, event delivery, event persistence, archiving, or setting search criteria see the reference topic devoted to activation specification properties in this documentation. For more information about setting the **Bidi format string** property, see the topic devoted to bidirectional transformation properties in the reference section of this documentation.

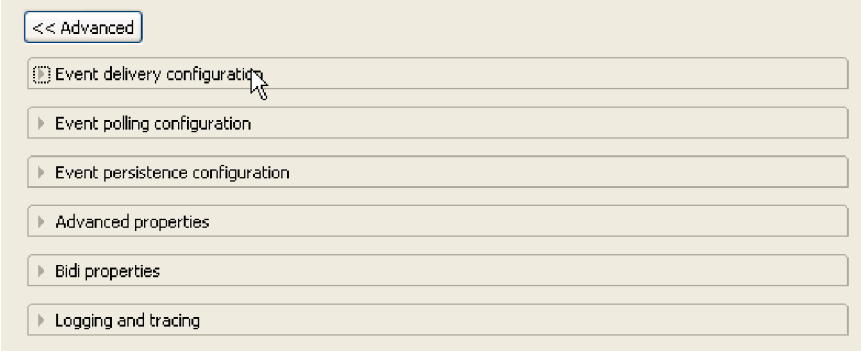


Figure 40. Advanced properties

a. Optional: If you choose not to use an authentication alias, expand **Advanced properties** and type the **User name** for the mail server. For inbound communications, a value for this field or an authentication alias is required to access e-mails on the mail server.

b. Optional: If you choose not to use an authentication alias, expand **Advanced properties** and type the **Password** for the mail server. For inbound communications, a value for this field or an authentication alias is required to access e-mails on the mail server.

c. Optional: To **Enable transport security (SSL)**, expand **Advanced properties** and select the check box.

6. On the Service Configuration Properties window, specify a J2C Authentication Data Entry. You specify an authentication alias name if you want to use an authentication alias. The wizard won't create one; it just configures the module to use one if you specify it.
7. To create or use an existing Function Selector Configuration, click **New** or **Browse**. Clicking **New** will take you directly to the screens in the external service wizard used to configure the data binding. You would only configure a function selector if you want to implement a custom function selector. This is a very advanced concept. By default, the e-mail function selector is used, which does not require any configuration.
8. Under Service Properties, clear the **Java Authentication and Authorization Services (JAAS) alias security credential** checkbox if you do not want to use an authentication alias. Authentication aliases should be configured before starting the wizard. The wizard won't create one; it just configures the module to use one if you specify it.
9. Optional: Select the **Change logging properties for wizard** check box if you want to define the level of logging for this module.

What to do next

Browse for or create a new data binding for the module.

Configuring the data binding

Data bindings read the fields in a business object and fill the corresponding fields in an e-mail. In the external service wizard, you add a data binding to your module and configure it to correspond with your data type. This way, the adapter knows how to populate the fields in an e-mail with information it receives in the business object.

Before you begin

You must have entered service configuration properties for the connection to the mail server.

About this task

To add and configure a data binding for the module, follow this procedure.

Note: Data bindings can be configured before running the external service wizard using WebSphere Integration Developer. To do this, select **New → Resource configuration** in WebSphere Integration Developer and complete the data binding screens described in this documentation.

Procedure

1. On the Service configuration properties window, select a value for **Data binding**. You may choose to use the data binding configuration for all operations or you may choose to specify a data binding for each operation. If you choose to use the data binding configuration for all operations, then the data binding configured here is used as the default data binding configuration for all operations you will configure. If you choose to specify a data binding for each operation, then you have to configure a data binding for each operation as explained in the following steps.
2. Choose whether the adapter will use an existing **data binding configuration** or create a new one.
   - To use an existing data binding configuration, click **Browse** and navigate to the data binding configuration.
   - If you do not have a data binding configured that for this operation, click **New** for **Data binding configuration**.
3. If you choose to create a new **Data binding configuration**, follow these steps.
   a. On the New Data Binding Configuration window, the **Module** defaults to the module name you typed earlier in the wizard. If this is not the module that you want to create a data binding for, choose **New** to create a new module.

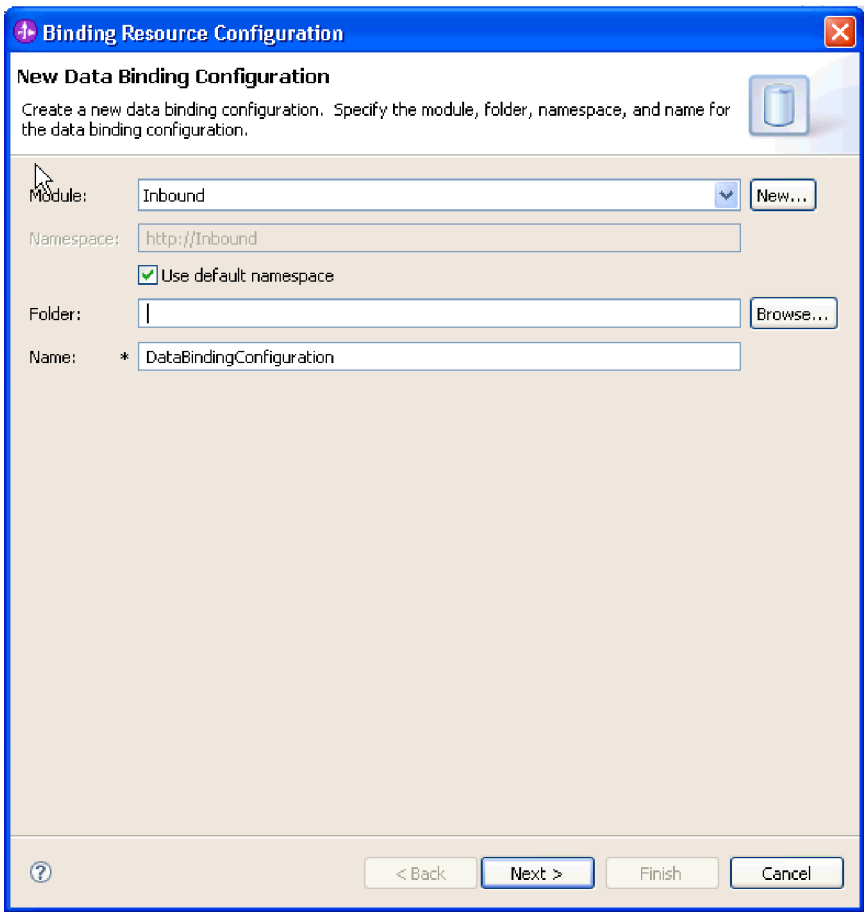


Figure 41. Naming the data binding configuration

b. If you want to choose a new folder for the artifact, click **Browse** and select a new folder location. If you do not browse for a new folder location, the artifacts will be created in the root directory for the module.

c. Type a **Name** for the data binding configuration and click **Next**.

d. Click **Next**.

4. On the Select a configuration type window, leave the **Data binding** radio button selected. The external service wizard defaults to the generic data binding used for the generic e-mail business object or generic e-mail business object with business graph data types.

5. Optional: If you plan to use the simple alert e-mail or user-defined type data types, complete the following steps to change the data binding configuration.

   a. Click **Browse** to select a Data binding class name. The term "class" here refers to the data binding class associated with the data binding you are in the process of creating for this module.

   b. On the Data Binding Selection window, leave the **Show Predefined Data Bindings** selected to use one of the data bindings included with WebSphere Integration Developer. The **Show Data Binding classes** option is available for advanced users who want to use a custom data binding. A custom data binding, once placed in the class path, will show when this radio button is selected.

   c. Select the correct data binding class for your data type and click **OK**.

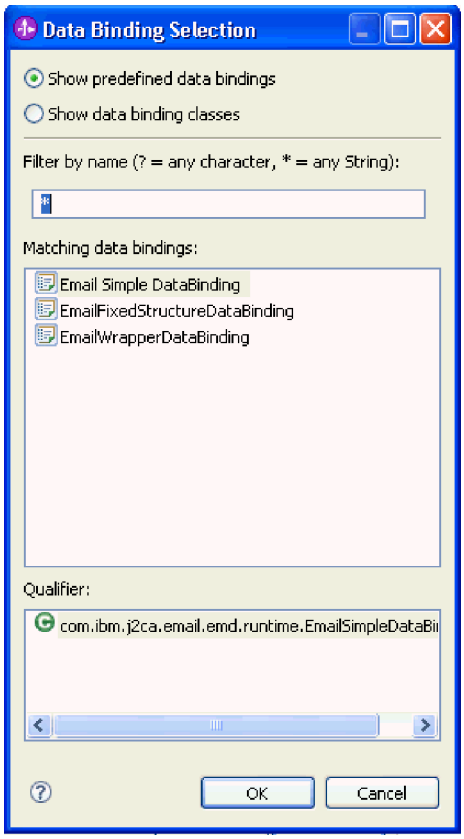


Figure 42. Selecting a data binding

The following data types are matched with the following data bindings.

Table 7. Data types and their data binding equivalents

Data type	Data binding
Generic e-mail	Email Wrapper Data Binding
Generic e-mail with business graph	Email Wrapper Data Binding
User defined type	EmailFixedStructureDataBinding

For more information about data bindings, see the topic devoted to outbound data transformation in this documentation.

The data binding class name will populate on the Select a configuration type window.

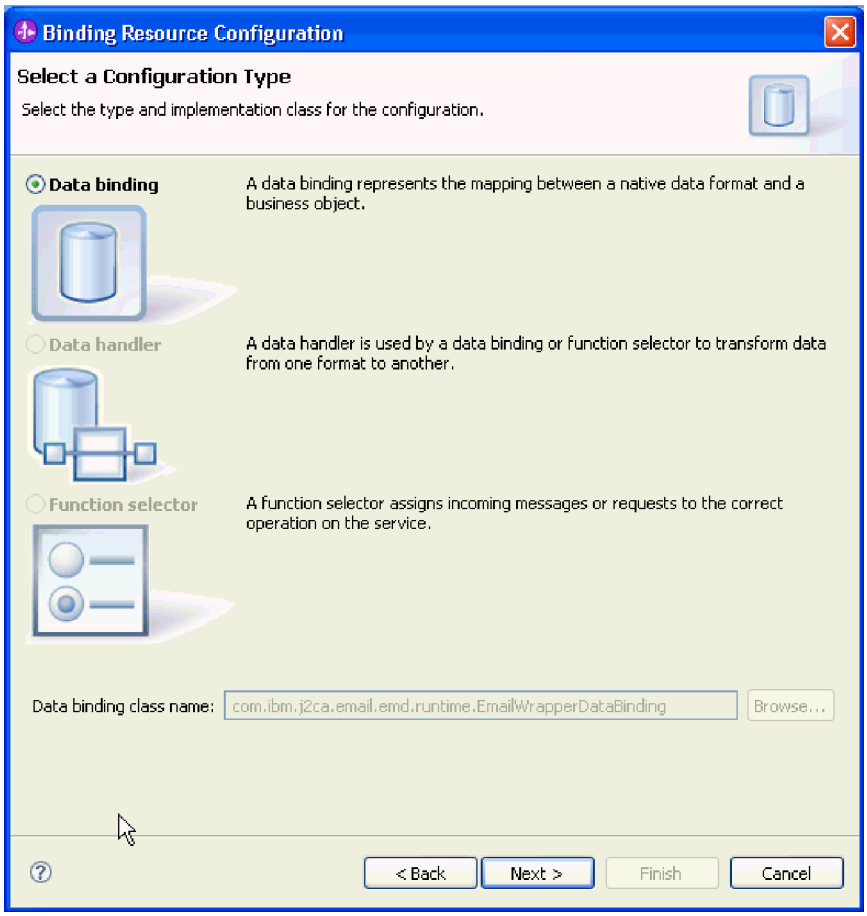


Figure 43. Data binding class is populated on the configuration type window

6. Click **Next**.

Results

A data binding is configured for use with the module.

What to do next

Specify data binding properties.

Configuring business object properties and data handlers

When you select a data type that contains business objects, you need to specify properties for those business objects. Completing this step does not add child business object to the Email parent object. Rather, they tell the adapter how to process particular types of business objects. Data handlers perform the conversions between a business object and a particular MIME format.

Before you begin

You must have created a data binding before specifying business object properties and data handlers for the module. Also, you must have predefined business objects using WebSphere Integration Developer Business Object Editor. If you stop the wizard here to create business objects, you will need to start the wizard steps from the beginning.

Note: Data handlers can be configured before running the external service wizard using WebSphere Integration Developer. To do this, select **New → Resource configuration** in WebSphere Integration Developer and complete the data handler screens described in this documentation.

About this task

You only need to define business object properties and data handlers if you have chosen the generic Email, Email with business graph, or user defined type as the data type. The simple alert Email data type does not have properties that need to be configured. To specify business object properties and data handlers, follow this procedure.

Procedure

1. If you chose the e-mail with business object, e-mail with business graph, or the user defined data type, click **Add** to add business object types to the data binding description on the Data Binding Properties screen.

   Important: If you are repeating these steps to configure a child data binding for the user defined data type, note that you cannot choose between data handler and data binding when you click on the **Edit** button. The binding type option (to choose between data binding and data handler) does not function correctly for the EmailFixedStructureDataBinding. To configure a child data binding for EmailFixedStructureDataBinding, click in the **Binding type** field and select to DataBinding. When you click **Edit** the Configured data binding option on the Add/Edit properties screen is enabled and can be used to configure a child data binding.

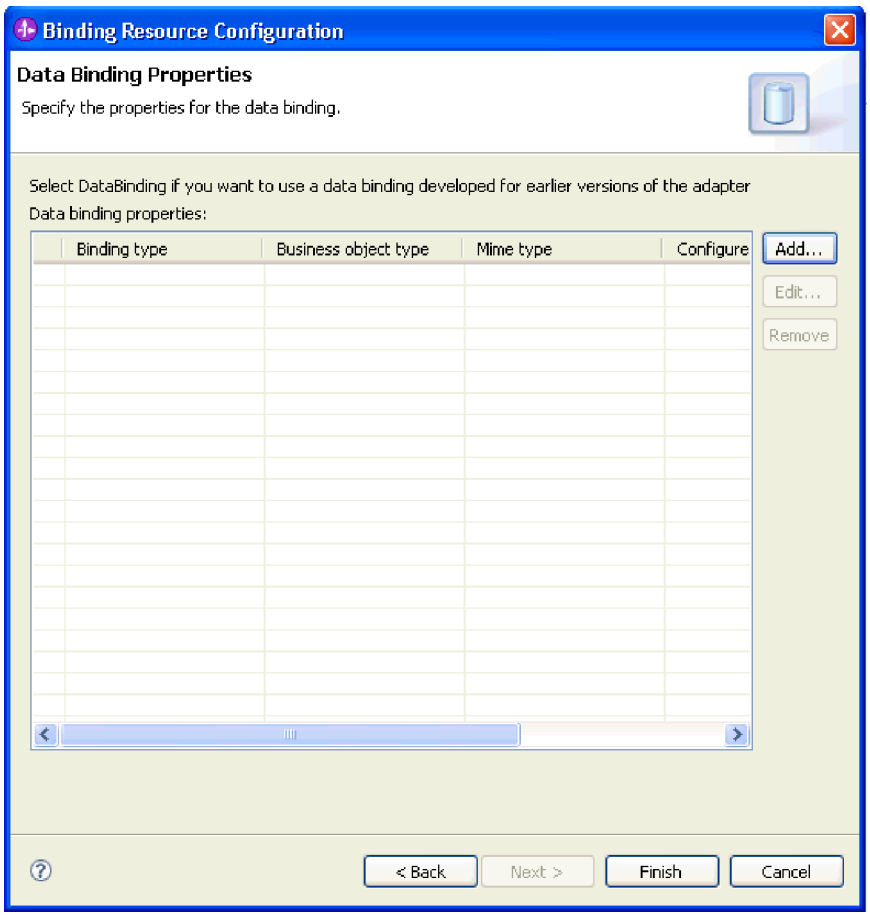


Figure 44. Adding business objects to the data binding configuration

2. **Browse** for business objects you have created on your system. These must be existing on your local system before you start the external service wizard.

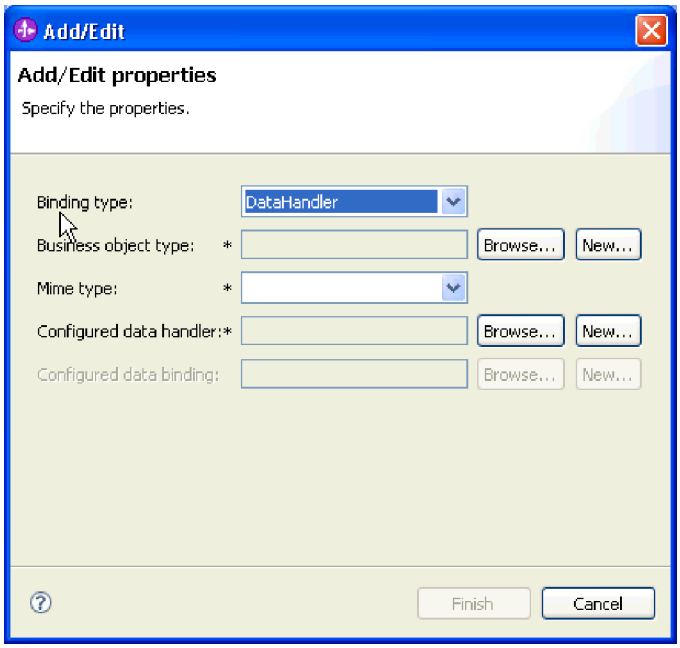


Figure 45. Adding or editing business object data binding properties

3. To select your **Business object type**, select **Browse** or **New**. Selecting business objects here does not physically add child business objects. Adding business objects at this stage in the wizard tells the adapter that you will likely use certain business object types in conjunction with your module, so it will know what data binding to apply to any child business objects it processes.
4. If you selected **Browse** for the **Business object type** field, select a **Data type** from the Data type selection options and click **OK**.
5. If you selected **New** for the **Business object type** field, complete the following steps.

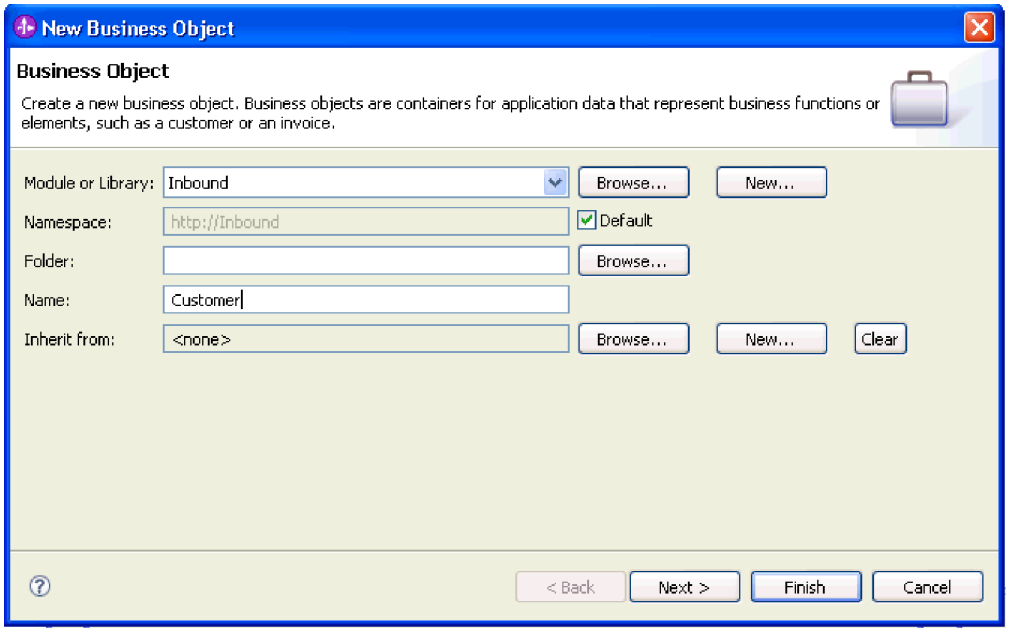


Figure 46. Specifying business object properties for the module

a. Select the **Module**. If the correct module is not shown, **Browse** for it or click **New** to create a new module.
b. Optional: Type a **Folder** name or **Browse** for the folder on your local drive where business object schema files (XSD files) generated by the external service wizard will be stored.
c. Type a **Name** for the business object.
d. If you do not want to populate the business object with fields from one or more existing business objects, click **Finish**.
e. If you want to populate the business object with fields from one or more existing business objects, click **Next**.

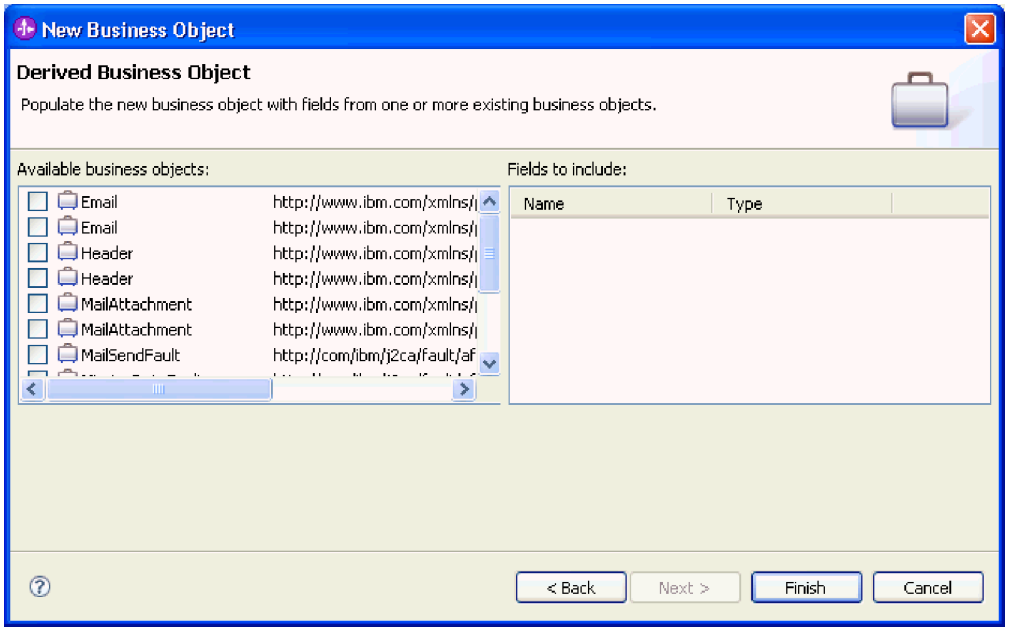


Figure 47. Deriving business object fields from an existing business object

f. Select the correct business object and click **Finish**. The **Business object type** on the Add/Edit properties window is populated.

6. On the Add/Edit window, select a mime type such as text/xml or text/html for your business object. The mime type corresponds to the data handler that is used by the adapter to perform data transformation from one format to another. This step enables the adapter to decide which format it has to convert the content to when it encounters the business object. For more information about data handlers and the mime types supported by the adapter, see the section on inbound data transformation in this documentation.
7. If you have configured a data handler already, you may **Browse** for it. Otherwise, click **New** to create a new data handler configuration. This works in conjunction with the mime type chosen in the step above.
8. If you clicked **New** to create a new data handler, complete the following steps.
   a. On the New Data Handler Configuration screen, select the module. If the correct module is not displayed, click **New** to create a new one.
   b. Optional: Type a **Folder** name if you'd like to specify a folder for the artifacts.
   c. Leave the default data handler **Name** or type a new one.

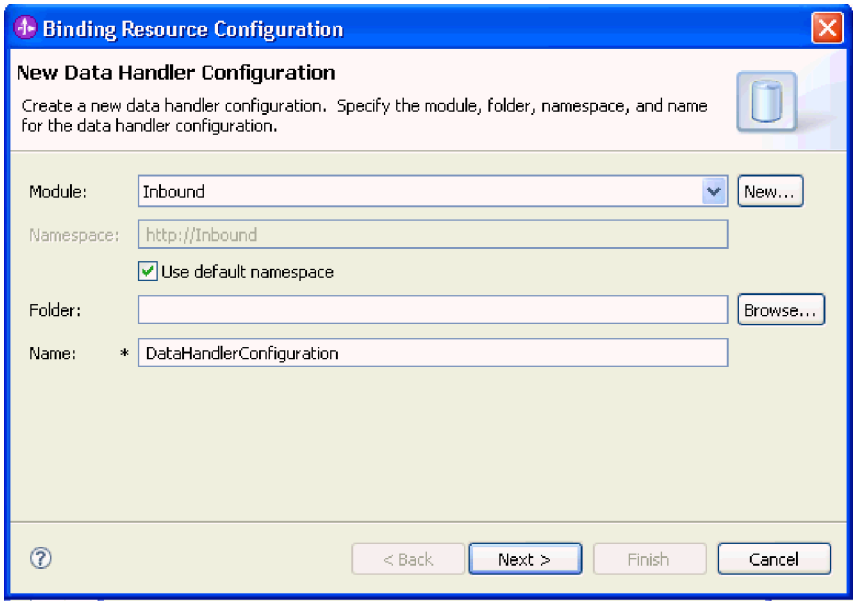


Figure 48. Creating a data handler

d. Click **Next**.

9. On the Select a configuration type window, leave the **Data Handler** radio button selected and click **Browse**.

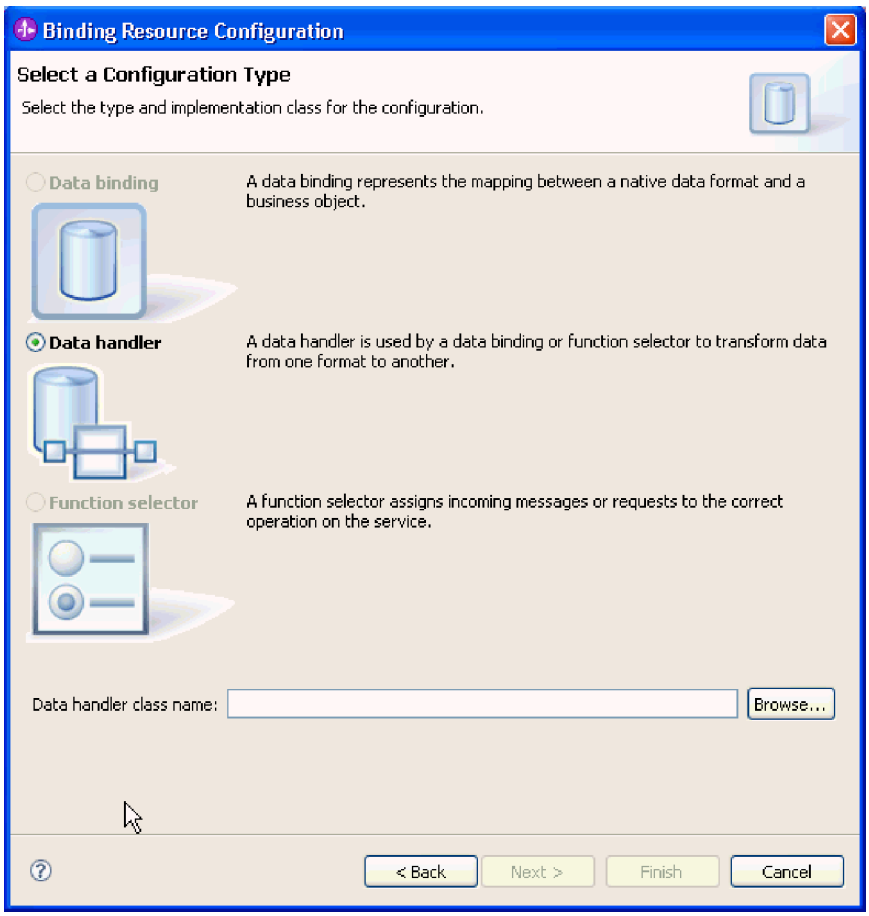


Figure 49. Choosing the data handler configuration type

10. On the Data Binding Selection window, leave **Show Predefined Data Handers** selected to use one of the data handlers included with WebSphere Integration Developer. The **Show Data Handler classes** option is available for advanced users who want to use a custom data handler. A custom data handler, once placed in the class path, will show when this radio button is selected.

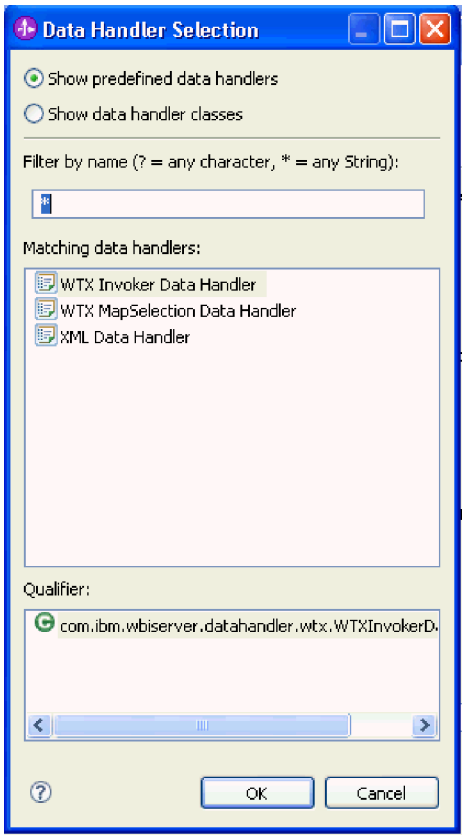


Figure 50. Selecting the data handler class

11. On the Select a configuration type window, the data handler class field is populated. Click **Next** to continue.
12. On the Specify Properties window, select an **encoding** value and then click **Finish**. This value indicates the type of character encoding the adapter will use during data transformation. For more information about the encoding property, see the reference topic devoted to Email business object properties in this documentation. The **Configured data handler** field is populated.
13. On the Add/Edit Properties window, select **Finish**.
14. Optional: If you want to add another business object type to the module, click **Add** and repeat the steps in this topic to specify business object properties and a data handler for each business object.
15. On the Data Binding Properties window, click **Finish**. The **Data biding configuration** field on the Service Configuration Properties window is populated.
16. On the Service Configuration Properties window, click **Next**.

Results

Business object properties and their data handlers are created.

What to do next

Specify interaction specification properties and generate artifacts for the module.

Selecting a data type and operation name

Use the external service wizard to select a data type and name the operation associated with this data type. For inbound communications, the external service wizard gives you the choice of three different data types: generic e-mail, generic e-mail with business graph, and user defined type. Each data type corresponds to a business object structure.

Before you begin

You must have specified the connection properties for the adapter to connect to the mail server, data bindings, and data handlers before you can specify the operation and data type for the module.

About this task

To select a data type and name the operation associated with it, follow this procedure.

Procedure

1. On the Operations window, click **Add**.

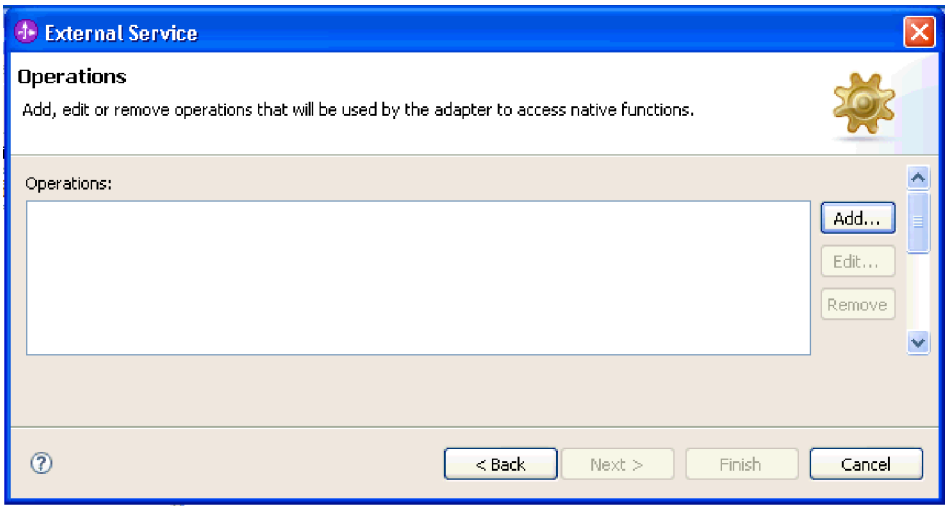


Figure 51. Adding an operation

2. On the Add Operations window, select a data type and click **Next**.

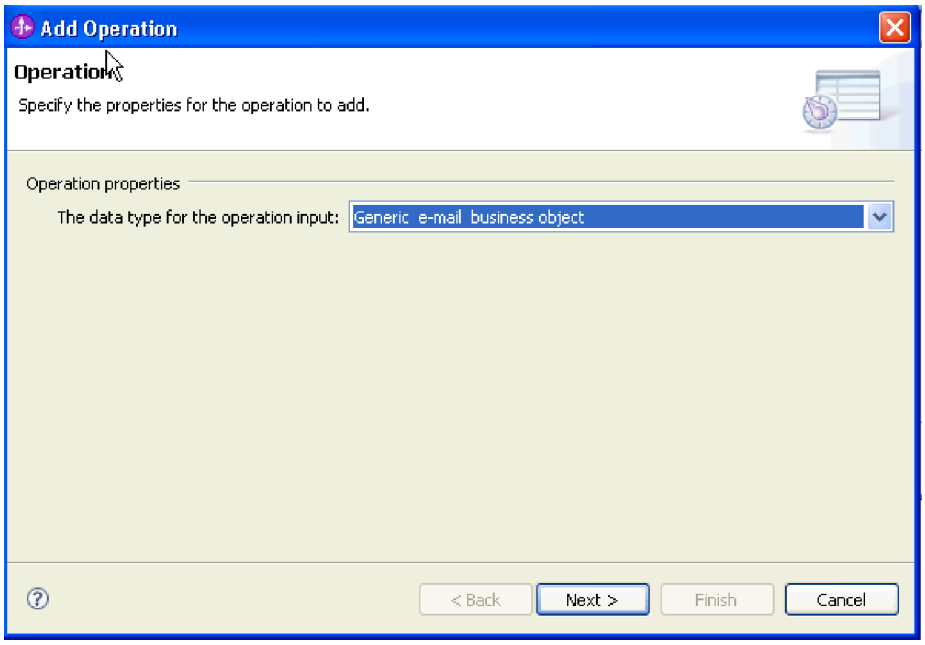


Figure 52. Selecting a data type

For more information about data types and what types of business objects they are used to produce, see the section devoted to business object structures in this documentation.

3. On the Add Operation screen, type an **Operation name**.

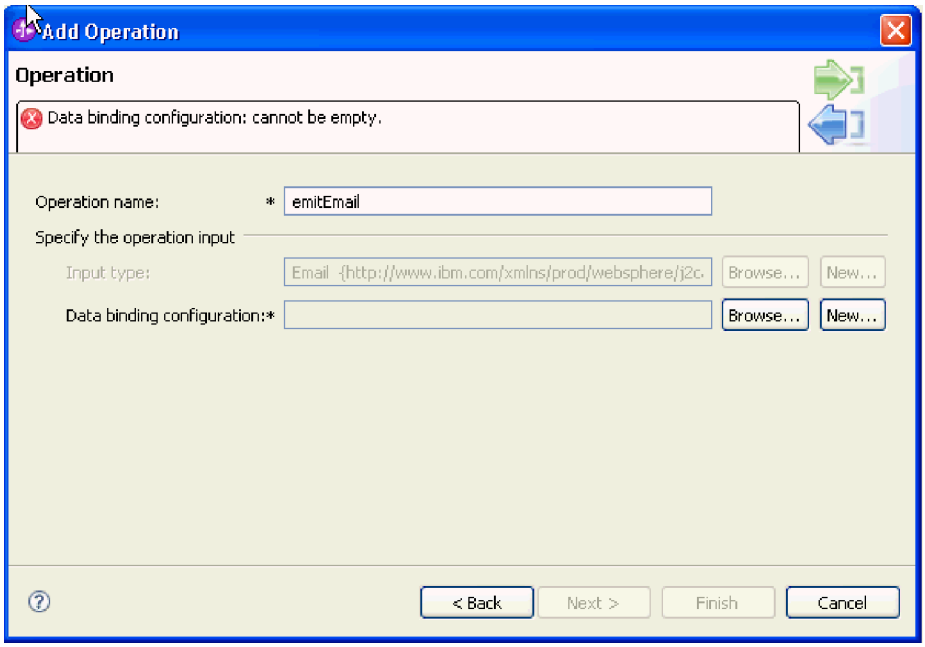


Figure 53. Naming the operation

Name the operation something meaningful. If this module is going to be used to convert a simple e-mail business object, name it something like SendEmail. Or, if it's going to be used to create a parent Email business object with a customer child business object, name it something like SendCustomerEmail. For

more information about the types of operations the adapter can perform, see the topic on Supported Operations in this documentation.

Note: Names cannot contain spaces.

4. The external service wizard will default to the correct data binding for the data type you selected on the Operation window. If you want to use a different data binding, **Browse** for a data binding or create a new one using the instructions in the sections ″Configuring the data binding″ and ″Configuring business object properties and data handlers.″
5. On the Operation window, click **Finish**.
6. On the Operations window, click **Next**.

Results

A data type is defined for the module and the operation associated with this data type is named.

What to do next

Generate artifacts for the module.

Setting deployment properties and generating the service

The export file is generated when the adapter creates artifacts for the module and contains the operation for the top level business object.

Before you begin

To generate artifacts for your module you must have already configured data bindings and selected business objects.

About this task

To generate artifacts for your module, follow this procedure.

Procedure

1. On the Generate Service screen, select the **Module**.

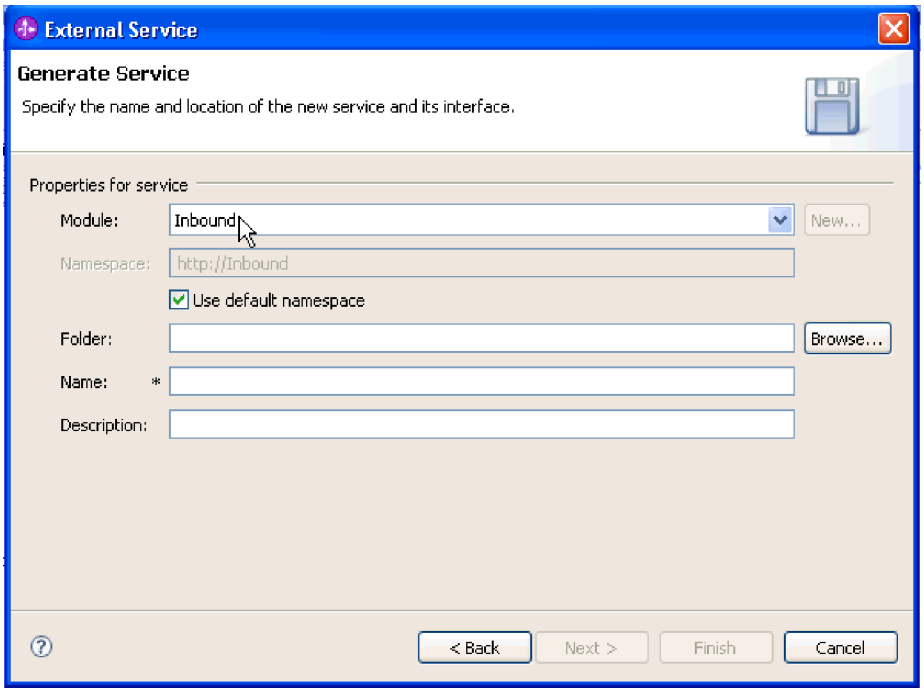


Figure 54. Naming the artifact

2. Optional: Name the **Folder** that will be used to store the artifacts.
3. Type a **Name** for the interface. This is the name that will display in the WebSphere Integration Developer assembly diagram.
4. Optional: Type a **Description**.
5. Click **Finish**. The WebSphere Integration Developer assembly diagram opens and the interface you created is displayed.

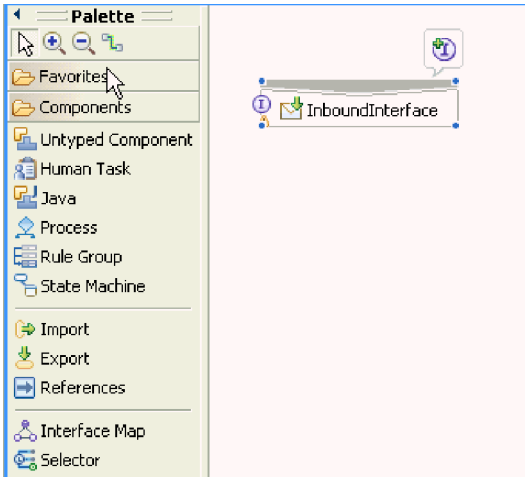


Figure 55. Interface in WebSphere Integration Developer

The business object you created is also displayed in a different tab.

Results

The WebSphere Integration Developer generates the artifacts and an export. The inbound artifacts that are created are visible in the WebSphere Integration Developer Project Explorer under your module.

What to do next

Deploy the module for either testing or production.

Chapter 5. 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 will 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 don't 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.
7. Click **Advanced** and change the property in the **Generic** tab. Repeat this step for each 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 6. 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.

Generating and wiring a target component for testing inbound processing

Before deploying to the test environment a module that includes an adapter for inbound processing, you must first generate and wire a target component. This target component serves as the *destination* to which the adapter sends events.

Before you begin

You must have generated an export module, using the external service wizard.

About this task

Generating and wiring a target component for inbound processing is required in a testing environment only. It is not necessary when deploying the adapter in a production environment.

The target component receives events. You *wire* the export to the target component (connecting the two components) using the assembly editor in WebSphere Integration Developer. The adapter uses the wire to pass event data (from the export to the target component).

Procedure

1. Create the target component
   a. From the Business Integration perspective of WebSphere Integration Developer, expand **Assembly Diagram** and double-click the export component. If you did not change the default value, the name of the export component is the name of your adapter + **InboundInterface**.

      An interface specifies the operations that can be called and the data that is passed, such as input arguments, returned values, and exceptions. The **InboundInterface** contains the operations required by the adapter to support inbound processing and is created when you run the external service wizard.
   b. Create a new component by expanding **Components**, selecting **Untyped Component**, and dragging the component to the Assembly Diagram.

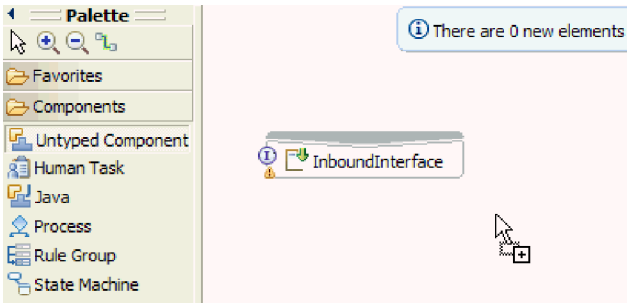


Figure 56. Adding a component to the Assembly Diagram

      The cursor changes to the placement icon.
   c. Click the component to have it displayed in the Assembly Diagram.
2. Wire the components.
   a. Click and drag the export component to the new component. This draws a wire from the export component to the new component, as shown in the following figure:

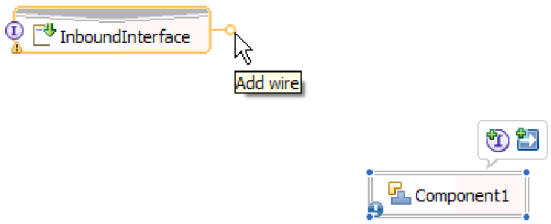


Figure 57. Selecting the wire icon

   b. Save the assembly diagram. Click **File** → **Save**
3. Generate an implementation for the new component.
   a. Right-click on the new component and select **Generate implementation** → **Java**.

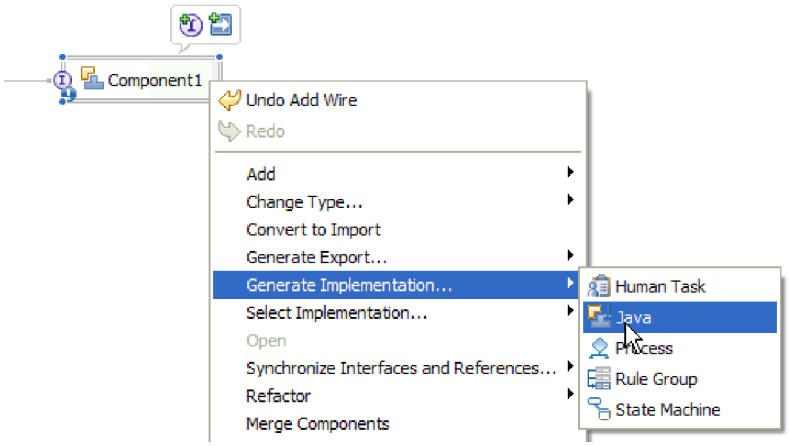


Figure 58. Generating a Java implementation

b. Select **(default package)** and click **OK**. This creates an endpoint for the inbound module.

   The Java implementation is displayed in a separate tab.

c. **Optional:** Add print statements to print the data object received at the endpoint for each of the endpoint methods.

d. Click **File** → **Save** to save the changes.

What to do next

Continue deploying the module for testing.

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, you need to generate and wire a *target component* to which the adapter will send 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 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.

Procedure

1. Select the module you want to test, right-click on it, and select **Test → Test Module**.
2. For information on 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 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

will 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 have set **Deploy connector project** to **On server for use by multiple adapters** in the Service Generation and Deployment Configuration 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. Start the administrative console.
2. Click **Resources** → **Resource Adapters** → **Resource adapters**.
3. From the Resource adapters page, click **Install RAR**.

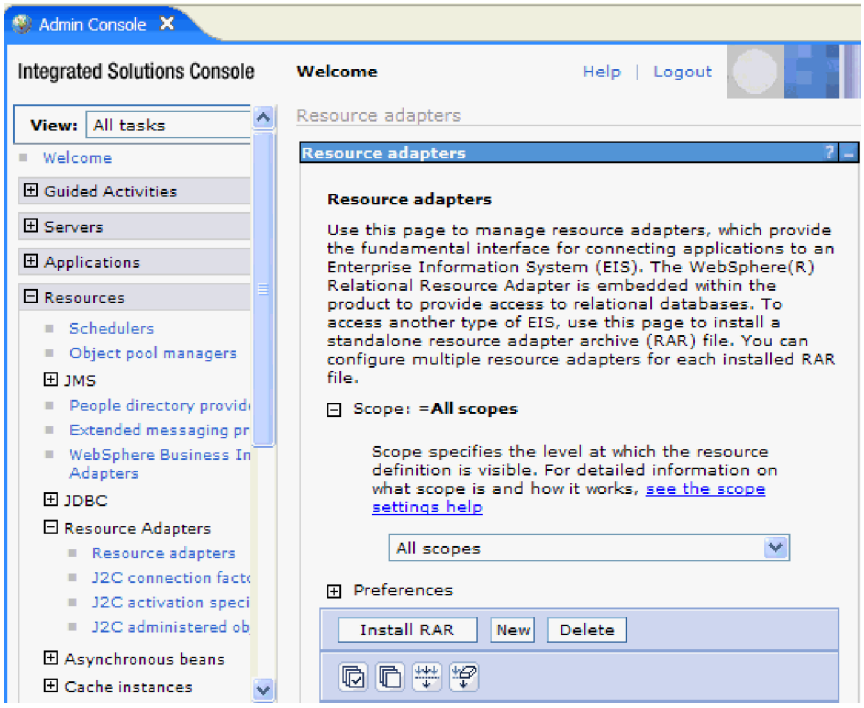


Figure 59. The Install RAR button on the Resource adapters page

4. From 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
5. Click **Next**.
6. From the Resource adapters page, optionally change the name of the adapter and add a description.
7. Click **OK**.
8. 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 **J2EE**.
3. Select **EAR file** and click **Next**.

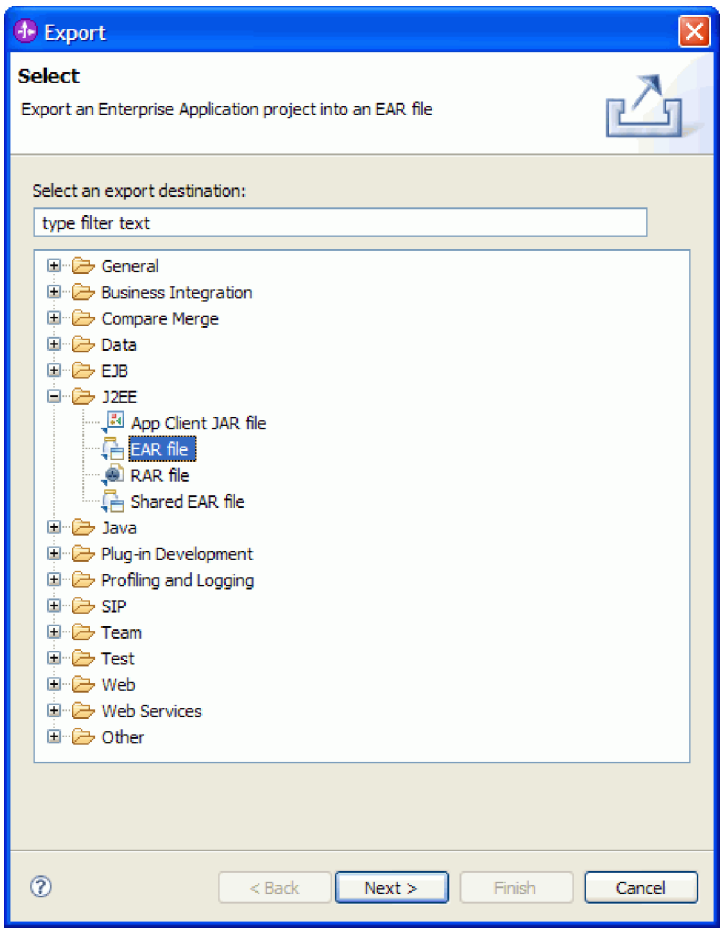


Figure 60. Selecting **EAR file** *from the Select window*

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. Optionally, if you want to export the source files, select **Export source files**. 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 an 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.

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.

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. Open the WebSphere Process Server administrative console by right-clicking your server instance and selecting **Run administrative console**.
2. In the administrative console window, click **Applications → Install New Applications**.

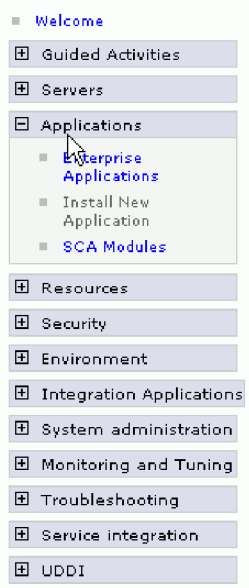


Figure 61. Preparing for the application installation window

3. Click **Browse** to locate your EAR file and click **Next**. The EAR file name is the name of the module followed by "App."
4. Optional: If you are deploying to a clustered environment, complete the following steps.
   a. On the **Step 2: Mapping modules to servers** window, select the module.
   b. Select the name of the server cluster.
   c. Click **Apply**.
5. Click **Next** to open the Summary. Verify that all settings are correct and click **Finish**.
6. Optional: If you are using an authentication alias, complete the following steps:

a. Expand **Security** and select **Business Integration Authentication Aliases**.
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 7. 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. You can update resource adapter properties (used for general adapter operation), managed connection factory properties (used for outbound processing), and activation specification properties (used for inbound processing).

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. Start the administrative console.
2. Under **Applications**, select **Enterprise Applications**.
3. From the **Enterprise Applications** list, click the name of the adapter module whose properties you want to change.
4. Under **Modules**, click **Manage Modules**.

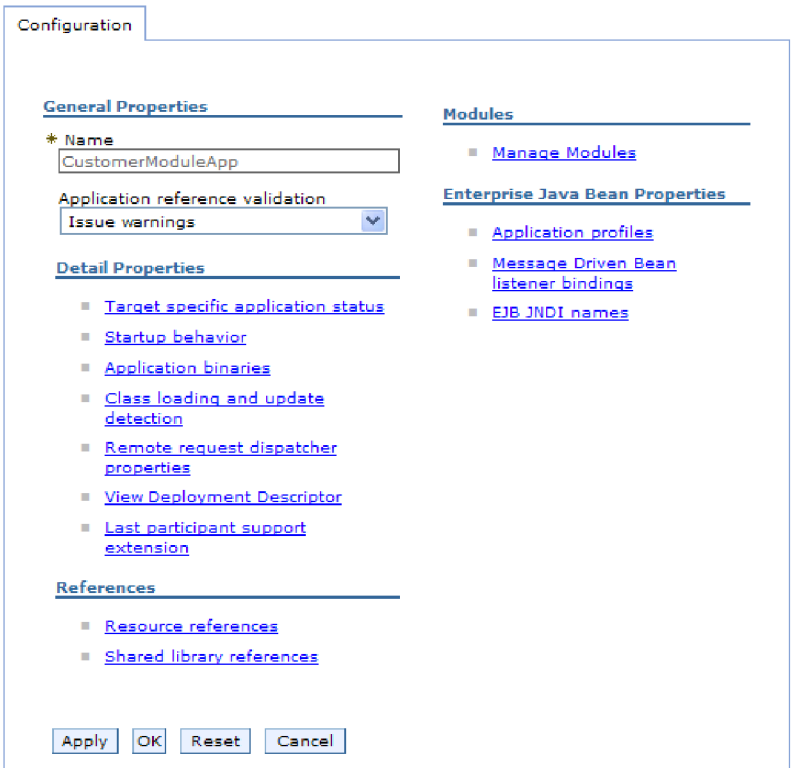


Figure 62. The Manage Modules selection in the Configuration tab

5. Click **IBM WebSphere Adapter for Email**.
6. From the **Additional Properties** list, click **Resource Adapter**.
7. On the next page, from the **Additional Properties** list, click **Custom properties**.
8. For each property you want to change, perform the following steps.

   Note: See "Resource adapter properties" on page 144 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.

      For example, if you click **logNumberOfFiles**, you see the following page:

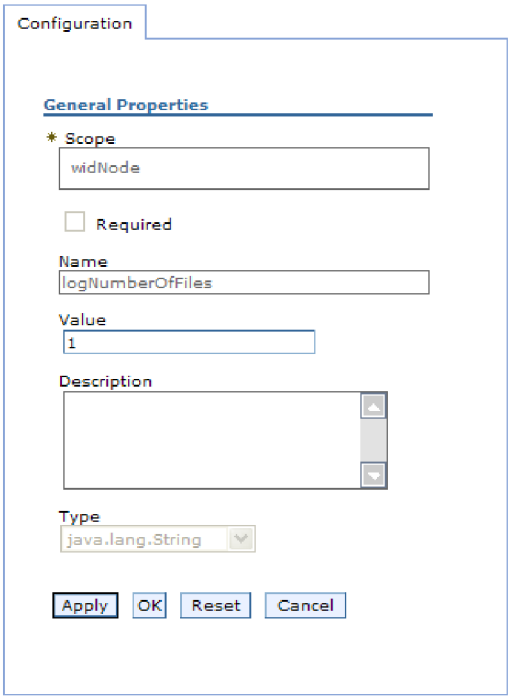


Figure 63. The Configuration tab for the logNumberOfFiles property

You can change the number in the **Value** field and add a description of the property.

c. Click **OK**.

9. Click the **Save** link in the **Messages** box at the top of the window.

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 mail 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. Start the administrative console.
2. Under **Applications**, select **Enterprise Applications**.
3. From the **Enterprise Applications** list, click the name of the adapter module whose properties you want to change.
4. Under **Modules**, click **Manage Modules**.

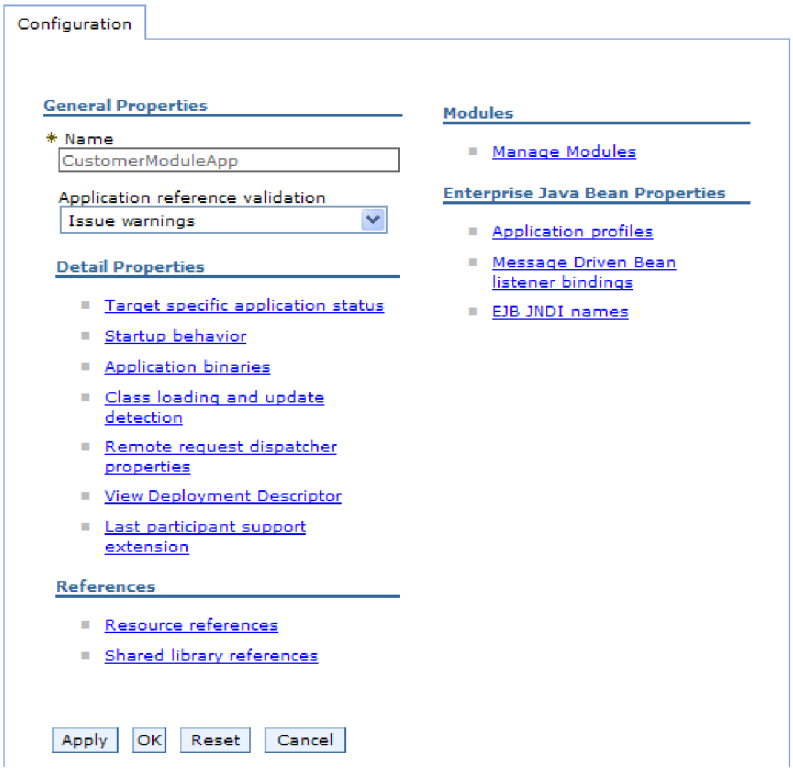


Figure 64. The Manage Modules selection in the Configuration tab

5. Click **IBM WebSphere Adapter for Email**.
6. From the **Additional Properties** list, click **Resource Adapter**.
7. On the next page, from the **Additional Properties** list, click **J2C connection factories**.
8. Click the name of the connection factory associated with your adapter module.
9. From the **Additional Properties** list, click **Custom properties**.

   Custom properties are those J2C connection factory properties that are unique to Adapter for Email. 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 connection factory properties" on page 141 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. Click the **Save** link in the **Messages** box at the top of the window.

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. Start the administrative console.
2. Under **Applications**, select **Enterprise Applications**.
3. From the **Enterprise Applications** list, click the name of the adapter module whose properties you want to change.
4. Under **Modules**, click **Manage Modules**.

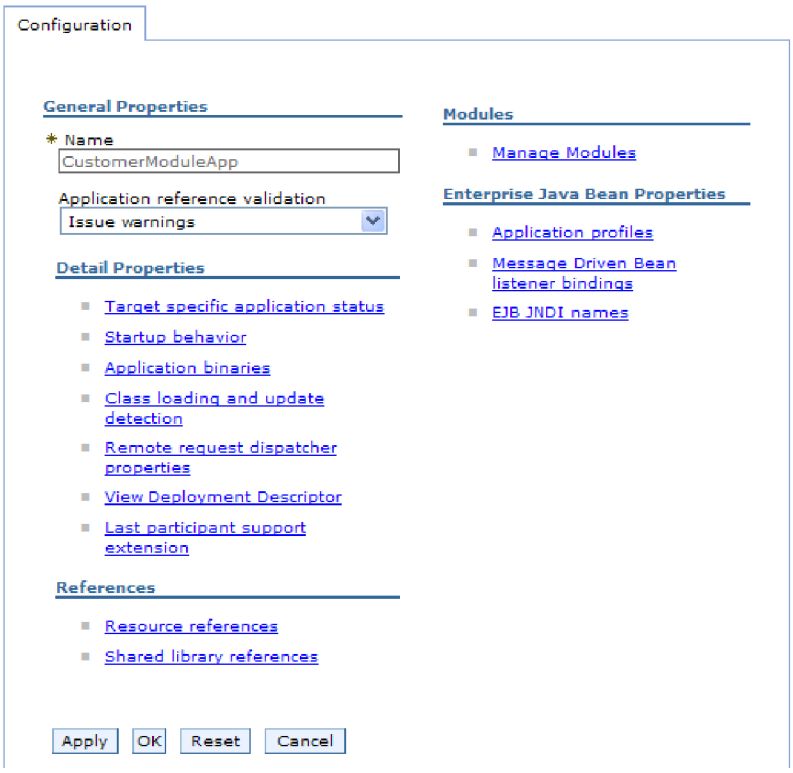


Figure 65. The Manage Modules selection in the Configuration tab

5. Click **IBM WebSphere Adapter for Email**.
6. From the **Additional Properties** list, click **Resource Adapter**.
7. On the next page, from the **Additional Properties** list, click **J2C activation specifications**.
8. Click the name of the activation specification associated with the adapter module.
9. From the **Additional Properties** list, click **J2C activation specification custom properties**.
10. For each property you want to change, perform the following steps.

    Note: See "Activation specification properties" on page 152 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. Click the **Save** link in the **Messages** box at the top of the window.

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 will be used for outbound operations, you create a connection factory and then set properties for it. If the adapter will be used for inbound operations, you create an activation specification 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. Start the administrative console.
2. Click **Resources** → **Resource Adapters** → **Resource adapters**.
3. From the Resource adapters page, click **IBM WebSphere Adapter for Email**.
4. From the **Additional Properties** list, click **Custom properties**.
5. For each property you want to change, perform the following steps.

   Note: See "Resource adapter properties" on page 144 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.

      For example, if you click **logNumberOfFiles**, you see the following page:

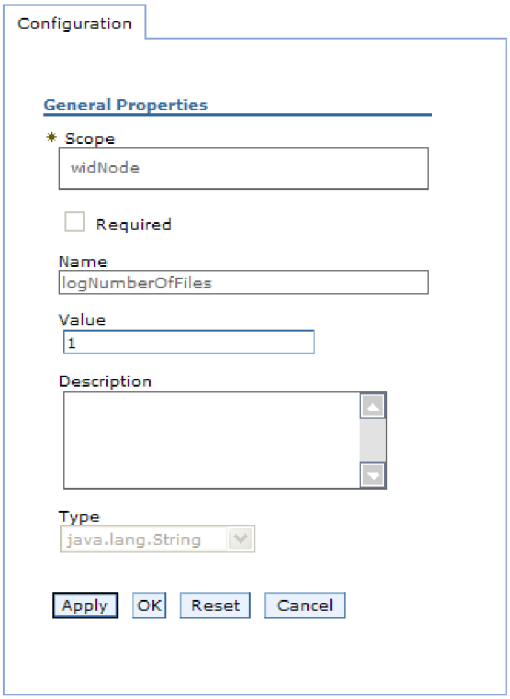


Figure 66. The Configuration tab for the logNumberOfFiles property

You can change the number in the **Value** field and add a description of the property.

c. Click **OK**.

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

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 mail 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. Start the administrative console.
2. Click **Resources** → **Resource Adapters** → **Resource adapters**.
3. From the Resource adapters page, click **IBM WebSphere Adapter for Email**.
4. From the **Additional Properties** list, click **J2C connection factories**.
5. If you are going to use an existing connection factory, skip ahead to step 6.

   Note: If you selected **Use predefined 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 could type `AdapterCF`.
   c. Type a value for **JNDI name**. For example, you could type `com/eis/AdapterCF`.
   d. Select an authentication alias from the **Component-managed authentication alias** list.
   e. Click **OK**.
   f. Click **Save** in the **Messages** box at the top of the page.

      The newly created connection factory is displayed.

Figure 67. The list of connection factories

6. From the list of connection factories, click the one you want to use.
7. From the **Additional Properties** list, click **Custom properties**.

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

   Note: See "Managed connection factory properties" on page 141 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**.
9. After you have finished setting properties, click **Apply**.

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

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. Start the administrative console.
2. Click **Resources** → **Resource Adapters** → **Resource adapters**.
3. From the Resource adapters page, click **IBM WebSphere Adapter for Email**.
4. From the **Additional Properties** list, click **J2C activation specifications.**.
5. If you are going to use an existing activation specification, skip ahead to step 6.

   Note: If you 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 could type `AdapterAS`.
   c. Type a value for **JNDI name**. For example, you could type `com/eis/AdapterAS`.
   d. 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.
6. From the list of activation specifications, click the one you want to use.
7. From the Additional Properties list, click **J2C activation specification custom properties**.

8. For each property you want to set, perform the following steps.

   Note: See "Activation specification properties" on page 152 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**.
9. After you have finished setting properties, click **Apply**.
10. Click **Save** in the **Messages** box at the top of the page.

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. On the administrative console, click **Applications → Enterprise Applications**.

   Note: The administrative console is labeled "Integrated Solutions Console".
2. Select the check box of the application that you want to start. The application name is the name of the EAR file you installed, without the .EAR file extension.
3. 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. On the administrative console, click **Applications → Enterprise Applications**.

Note: The administrative console is labeled “Integrated Solutions Console”.

2. Select the check box of the application that you want to stop. The application name is the name of the EAR file you installed, without the .EAR file extension.
3. 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 Email. 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.

About this task

You can monitor the performance of your adapter by having PMI collect data at the following points:

- At outbound processing to monitor outbound requests
- At inbound event retrieval to monitor the retrieval of an event from the event table
- At inbound event delivery to monitor the delivery of an event to the endpoint or endpoints

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 Application Server 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 109.

2. Generate at least one outbound request or inbound event 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, then select the **Enable Performance Monitoring (PMI)** check box.
   d. Select **Custom** to selectively enable or disable statistics.

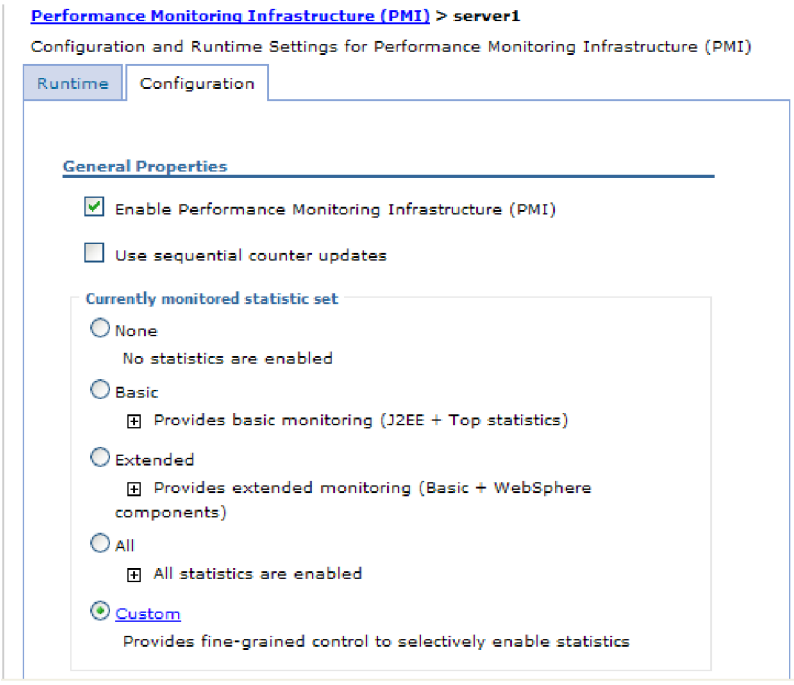


Figure 68. Enabling Performance Monitoring Infrastructure

   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.

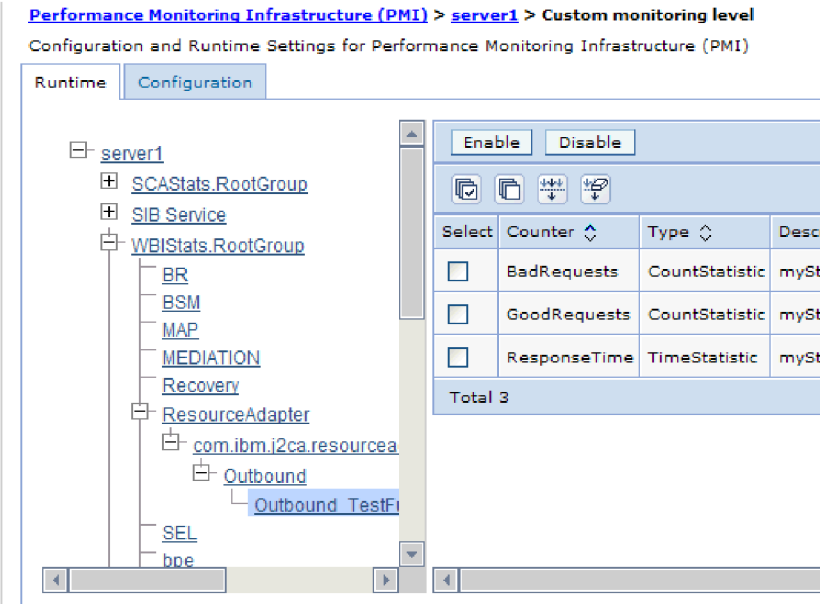


Figure 69. Runtime tab used for configuring PMI

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

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 as a graph.

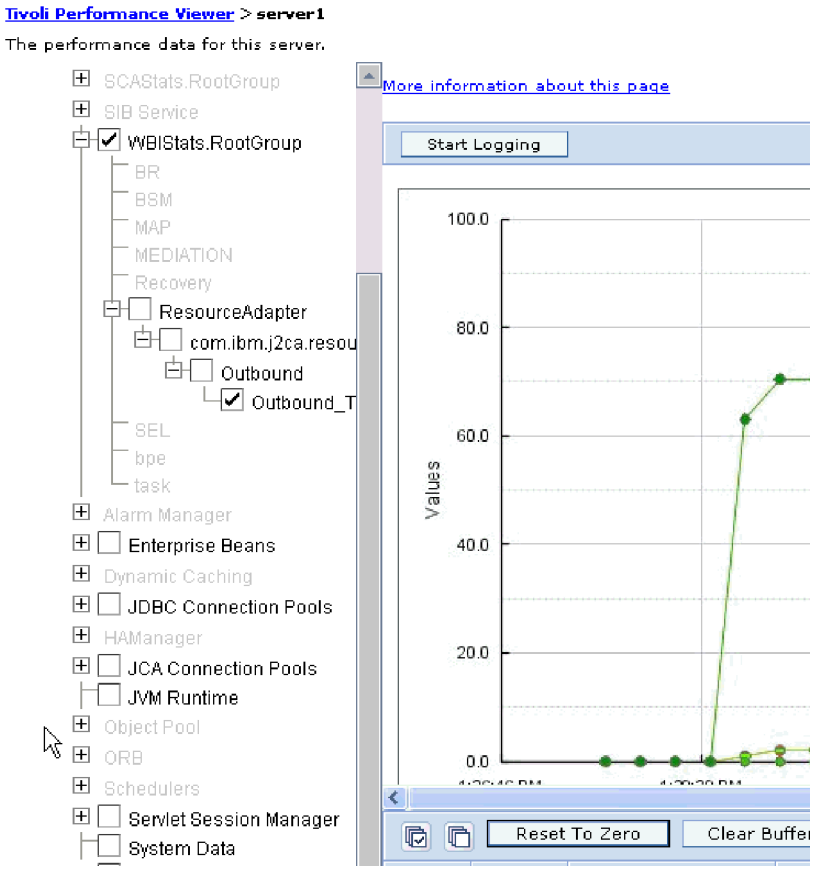


Figure 70. Adapter performance statistics, using graph view

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.

Procedure

1. In the administrative console, click **Troubleshooting**.
2. Click **Logs and Trace**.
3. In 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, choose one of the following:

     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 all of the 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.

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 take effect when you start or restart the application server. Dynamic, or runtime, 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.base.***.
   - For the Adapter for Email only, select the **com.ibm.j2ca.email** 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.

Logging Level	Description
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, respectively.

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 Email.
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. This method allows you to make changes that take effect right away.

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.

Business faults

The adapter supports business faults, which are exceptions that are anticipated and declared in the outbound service description, or import. Business faults occur at predictable points in a business process as a result of a business rule violation or a constraint violation.

Although WebSphere Process Server and WebSphere Enterprise Service Bus support other types of faults, the adapter generates only business faults, which are called simply *faults* in this documentation. Not all exceptions become faults. Faults are generated for errors that are actionable, that is, errors that can have a recovery action that does not require the termination of the application. For example, the adapter generates a fault when it receives a business object for outbound processing that does not contain the required data or when the adapter encounters certain errors during outbound processing.

Fault business objects

The external service wizard creates a business object for each fault that the adapter can generate. In addition, the wizard creates a WBIFault superset business object, which has information common to all faults, such as the message, errorCode, and primarySetKey attributes as shown in Figure 71 on page 114.

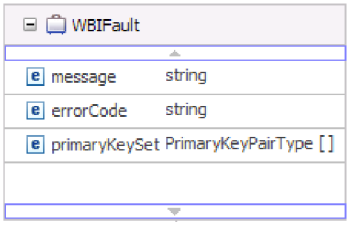


Figure 71. The structure of the WBIFault business object

The wizard creates the following fault business objects:

- EmailSendFault

  When processing any create operation, the adapter throws this fault when sending an e-mail if a exception occurs that is not related to connection to the mail server.
- MissingDataFault

  If the business object that is passed to the outbound operation does not have all the required attributes, then the adapter throws this fault.

Configuring the module for fault processing

Before you can configure your module to support business faults, you must have used the external service wizard to configure your module.

Since tooling support is not provided for fault configuration, you must modify the .import and WSDL files for your module to enable faults. Changes to the import file may be made at the binding level or method level. The table below contains the fault names and the corresponding fault binding class names needed for configuration. Use these pairs when adding fault binding information to import file. If the changes are made at binding level, they apply to all methods in the import. If the changes are made at the method binding level, you can configure a different fault for each method.

Table 8 lists the fault name and fault binding for each fault. Use the fault name and fault binding class when you configure the module.

Table 8. The fault name and fault binding class for each fault

Fault name	Associated fault binding class
MAIL_SEND	com.ibm.j2ca.extension.emd.runtime.WBIFaultDataBindingImpl
MISSING_DATA	com.ibm.j2ca.extension.emd.runtime.WBIFaultDataBindingImpl

1. Edit the .import file to configure the fault at either the binding or the method level.
   - To configure the faults at the binding level (applied to all methods in the import):
     a. In the binding section, add the faultSelector attribute and the name of the fault selector. The name of the fault selector is com.ibm.j2ca.extension.emd.runtime.WBIFaultSelectorImpl.
     b. For each fault that you want to enable, add a <faultBinding> element. In the element, specify the fault name and the fault data binding class name from Table 8.

The following section of the .import file shows the MISSING_DATA fault configured for all methods. **Bold face type** indicates changes made to enable fault handling.

```
<esbBinding xsi:type="EIS:EISImportBinding"
dataBindingReferenceName="HDTV:DataBindingConfiguration"
faultSelector="com.ibm.j2ca.extension.emd.runtime.WBIFaultSelectorImpl">
   <resourceAdapter name="HDTVApp.IBM WebSphere Adapter for Email"
   type="com.ibm.j2ca.email.EmailResourceAdapter" version="6.1.0.0_IF01">
      <properties>
        <adapterID>CWYEM_EMail</adapterID>
      </properties>
    </resourceAdapter>
<faultBinding fault=" MISSING_DATA "
faultBindingType="com.ibm.j2ca.extension.emd.runtime.WBIFaultDataBindingImpl"/>
```

- To configure the faults at the method level:
  a. In method binding section for the method you want to associate with the fault, add the name of the fault selector. The value for fault selector is com.ibm.j2ca.extension.emd.runtime.WBIFaultSelectorImpl.
  b. Add the fault binding elements in the method binding section. Use the fault name and the corresponding fault data binding class name from Table 8 on page 114.

     The following .import file shows the MAIL_SEND and MISSING_DATA faults configured for only the senEmailBG method. **Bold face type** indicates changes made to enable fault handling.

```
<methodBinding method="senEmailBG"
faultSelector="com.ibm.j2ca.extension.emd.runtime.WBIFaultSelectorImpl">
<interaction>
        <properties>
          <functionName>Create</functionName>
        </properties>
</interaction>
<faultBinding fault="MAIL_SEND"
faultBindingType="com.ibm.j2ca.extension.emd.runtime.WBIFaultDataBindingImpl"/>
<faultBinding fault="MISSING_DATA"
faultBindingType="com.ibm.j2ca.extension.emd.runtime.WBIFaultDataBindingImpl"/>
</methodBinding>
```

2. Determine the target namespaces for your faults. For each fault that you want to enable, determine the namespace as follows:
   a. Open the fault schema (XSD file) in a text editor.
   b. Locate the target namespace. The target namespace is shown in **bold face type** in the following portion of a fault schema:

```
<?xml version="1.0" encoding="UTF-8" ?>
<schema xmlns="http://www.w3.org/2001/XMLSchema"
   targetNamespace="http://com/ibm/j2ca/fault/afcfault"
   xmlns:basefault="http://com/ibm/j2ca/fault">
<import namespace="http://com/ibm/j2ca/fault" schemaLocation="WBIFault.xsd"/>

. . .
```

      The faults can all have the same target namespace or they can have different target namespaces.
3. Edit the WSDL file to declare the faults for the service. A sample WSDL file with these changes made is shown at the end of the list.
   a. In the <definitions> element, add a namespace for each fault namespace, using the information you obtained from the fault schema files. If all your fault schemas have the same targetNamespace, add only one alias. If they have different targetNamespaces, add an alias for each unique namespace.
   b. Create an <xsd:import> element to import the schema for each fault you want to enable.
   c. Declare import statements for each fault type. Make sure that you are using the correct alias defined in step 3a to resolve the complex type in `type=`*`alias`*`:`*`faultBOName`*`.xsd`.

d. Declare the message tags for each of the fault types.

e. Add the fault declaration to each method where faults should be handled.

The following segment of a WSDL file defines the MAIL_SEND and MISSING_DATA faults. **Bold face type** indicates changes made to enable fault handling.

```
<definitions xmlns="http://schemas.xmlsoap.org/wsdl/"
  xmlns:Email="http://www.ibm.com/xmlns/prod/websphere/j2ca/email/email"
  xmlns:bons1="http://com/ibm/j2ca/fault/afcfault""
  xmlns:intf="http://EmailOutbound/OutboundApp"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  name="OutboundApp.wsdl"
  targetNamespace="http://EmailOutbound/OutboundApp">
  <types>
    <xsd:schema
        xmlns:tns="http://EmailOutbound/OutboundApp"
        xmlns:xsd1="http://www.ibm.com/xmlns/prod/websphere/j2ca/email/email"
        elementFormDefault="qualified"
        targetNamespace="http://EmailOutbound/OutboundApp"
        xmlns:bons1="http://com/ibm/j2ca/fault/afcfault"
        xmlns:xsd="http://www.w3.org/2001/XMLSchema">

. . .
<xsd:import namespace="http://com/ibm/j2ca/fault/afcfault"
   schemaLocation="./CommonSchemas/MailSendFault.xsd"/>
<xsd:import namespace="http://com/ibm/j2ca/fault/afcfault"
   schemaLocation="./CommonSchemas/MissingDataFault.xsd"/>

. . .
      </xsd:element>
 <xsd:element name="createEmail_Fault1" type="bons1:MailSendFault"/>
 <xsd:element name="createEmail_Fault2" type="bons1:MissingDataFault"/>
    </xsd:schema>
  </types>

  . . .
<message name="createEmail_Fault1Msg">
 <part element="intf:createEmail_Fault1" name="Fault1"/>
</message>
<message name="createEmail_Fault2Msg">
 <part element="intf:createEmail_Fault2" name="Fault2"/>
</message>
<input message="intf:createEmailRequest" name="createEmailRequest"/>
<fault message="intf:createEmail_Fault1Msg" name="Fault1"/>
<fault message="intf:createEmail_Fault2Msg" name="Fault2"/>
</operation>

  . . .
```

Step 3a on page 115

Step 3b on page 115

Step 3c on page 115

Step 3d

Step 3e

XAResourceNotAvailableException

When the process server log contains repeated reports of the com.ibm.ws.Transaction.XAResourceNotAvailableException exception, remove transaction logs to correct the problem.

Symptom:

When the adapter starts, the following exception is repeatedly logged in the process server log file:

com.ibm.ws.Transaction.XAResourceNotAvailableException

Problem:

A resource was removed while the process server was committing or rolling back a transaction for that resource. When the adapter starts, it tries to recover the transaction but cannot because the resource was removed.

Solution:

To correct this problem, use the following procedure:

1. Stop the process server.
2. Delete the transaction log file that contains the transaction. Use the information in the exception trace to identify the transaction. This prevents the server from trying to recover those transactions.

   Note: In a test or development environment, you can generally delete all of the transaction logs. In WebSphere Integration Developer, delete the files and subdirectories of the transaction log directory, *server_install_directory*\profiles\ *profile_name*\tranlog.

   In a production environment, delete only the transactions that represent events that you do not need to process. One way to do this is to reinstall the adapter, pointing it to the original event database used, and deleting only the transactions you do not need. Another approach is to delete the transactions from either the log1 or log2 file in the following directory:

   server_install_directory\profiles*profile_name*\tranlog*node_name*\wps\ *server_name*\transaction\tranlog
3. Start the process 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 the following types of

- 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 should 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 Email, 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 Email provides a plug-in for IBM Support Assistant, which is a free, local software serviceability workbench. For information about installing or using IBM Support Assistant, visit this address:

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

Configuring a data binding after migrating a WebSphere Adapter for Email, Version 6.0.2 module

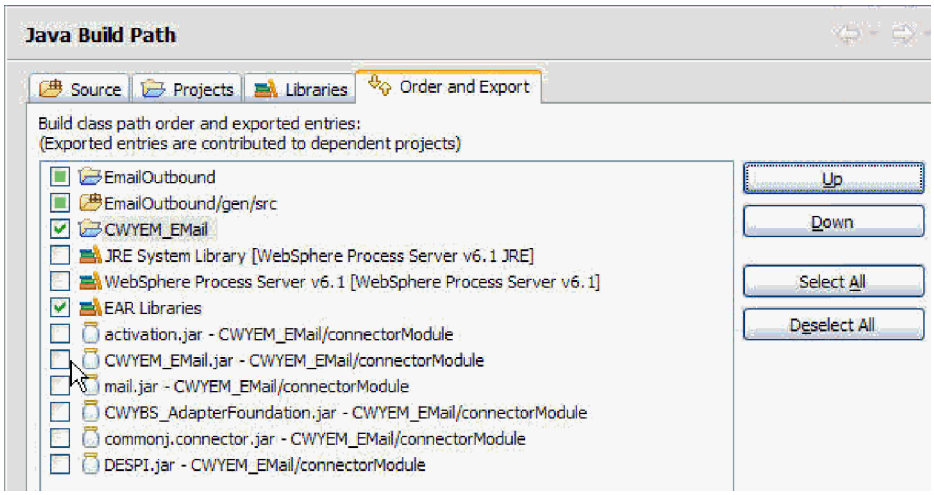
After migrating a WebSphere Adapter for Email module to version 6.1.0 and launching the external service wizard, when you try to create a new data binding, the **Finish** button is not enabled.

Before you begin

You must have run the migration wizard on the version 6.0.2 module.

About this task

The **Finish** button fails to enable because the class paths are not set up correctly after importing a version 6.0.2 Project Interchange file. The adapter project CWYEM_Email is above the JRE System Library and WebSphere Process Server v6.1 library as shown in the following image.



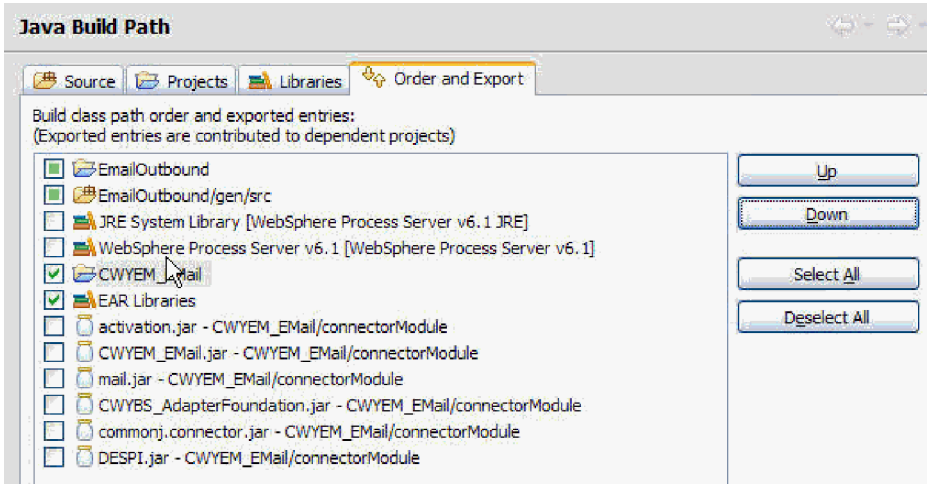
To move the CWEM_EMail project below the JRE System Library and WebSphere Process Server,version 6.1.0 complete the following steps:

Procedure

1. Right click the Business Integration Module and select **Properties**.
2. Select CWYEM_Email and use the **Down** button to move CWYEM_Email below the JRE System Library and WebSphere Process Server,version 6.1.0 as shown below.
3. Click **OK**.

Results

The CWEM_EMail project is below the JRE System Library and WebSphere Process Server,version 6.1.0.



Chapter 8. Reference information

To support you in your tasks, reference information includes details about business objects that are generated by the external service wizard and information about adapter properties, including those that support bidirectional transformation. It also includes pointers to adapter messages and related product information.

Business object information

A business object is a structure that contains specific information about an e-mail being processed by an inbound or outbound module. Business objects contain information about how the adapter will process the e-mail content and attachments and are associated with an operation (such as create). Business object names are generated by the external service wizard and are named according to their contents.

Business object structures

The adapter supports three different types of business object structures. For outbound communications, there is a simple alert e-mail structure which is used to send text-only messages, the Email business object structure which can contain child business objects, and a fixed structure business object structure which supports very specific business object structures (such as customer or order business objects). For inbound communications, only the Email business object and fixed structure business object structures are supported.

All the business object structures include standard headers such as To and From in the wrapper business object. For more information about the headers supported by the adapter, see the reference topic devoted to Header business object properties in this documentation.

Simple alert e-mail business object structure

The simple alert e-mail business object structure (SimpleAlertEmail) is supported only during outbound communications. This structure's purpose is to send a single string e-mail message to the mail server. With the SimpleAlertEmail structure, the e-mail message does not be undergo any formatting or transformation. The intended recipient is a human and the body mime type is text/plain. As shown in the following illustration, it is composed of a single business object.

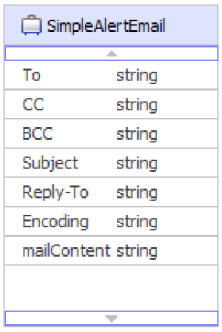


Figure 72. SimpleAlertEmail business object structure

With this business object structure, the only required values are the From and To fields. For more information about the SimpleAlertEmail business object structure's values, see the section on the SimpleAlertEmail business object structure in the reference section of this documentation.

Email business object structure

The Email business object structure is used for both inbound and outbound communications. The adapter always creates an Email business object. The Email business object is a parent business object consisting of attributes that directly relate to the fields in an e-mail message. If you choose, it can also contain child business objects for e-mail mailContent and attachments. The following illustration shows the Email business object with two child business objects: header and mailAttachments.

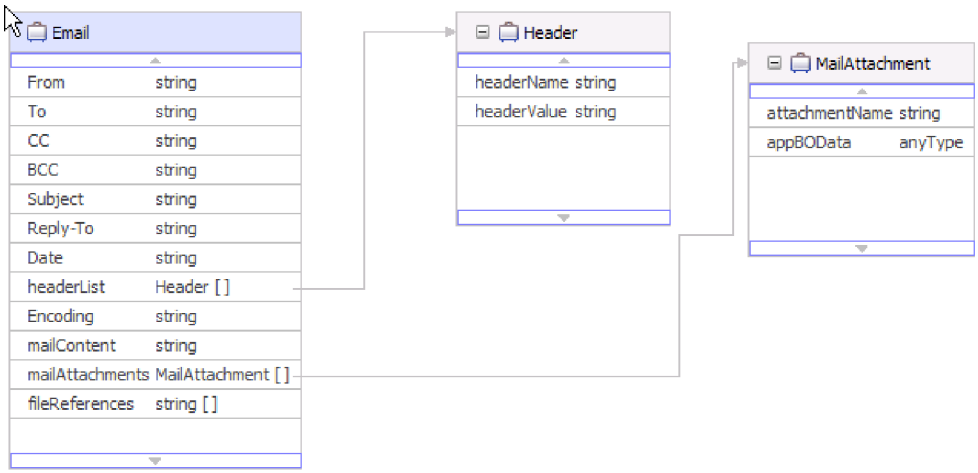


Figure 73. Email business object with mail attachment and header child objects

The header child business object shown in Figure 73 stores header information for an e-mail. The headerList attribute in the Email wrapper object is an array of header business objects. headerList may contain all the headers for an e-mail, each represented by a header business object. However, the standard headers present in the Email wrapper business object takes precedence over the headers in the headerList attribute.

Note: Bcc and Resent-bcc headers, however, cannot be retrieved from an inbound e-mail, but they can be set for outbound e-mails.

For each attachment on an inbound e-mail, the adapter creates a separate mail attachment business object. For every mail attachment business object the adapter receives during outbound communications, the adapter creates a separate e-mail attachment. As noted in the illustration, the mail attachment business object consists of an attachment name and the data in the attachment.

The data in an attachment can be of any type. Business objects such as Customer or PurchaseOrder, which have been defined in the business object editor before being processed by external service wizard and have a specific structure outlined by you, are called structured content business objects. Similarly, you can specify a structured business object for the mailContent attribute of the Email wrapper business object.

Structured content business objects are decomposed by the data binding and their content recorded into individual logical fields within the business object structure. Unstructured content business objects are used for pass-through processing during outbound communications.

Note: Because the adapter expects to decompose each business object added to the module, you must define a data binding mime type and a data handler during the data binding configuration portion of the external service wizard. The adapter will not automatically associate a data binding mime type and data handler type with your business object since it has no way of knowing what type of conversion is necessary for the objects you import.

The following illustration shows a mail attachment business object with a customer child object.

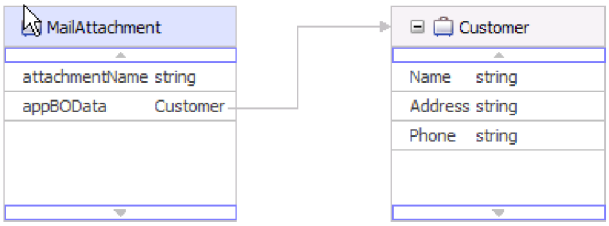


Figure 74. Mail attachment business object with structured content child object

Unstructured content business objects are used to store unstructured data, such as rich text, PDF, or images (as binary content). They are not decomposed by the data binding because their content is not placed into specific fields in the business object. Instead, unstructured content is supplied as a single string or binary field in the business object structure. The illustration below shows a mail attachment business object with an unstructured content child object.

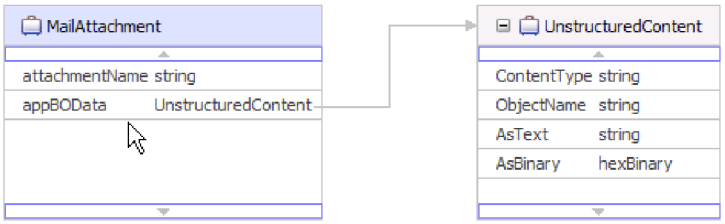


Figure 75. Mail attachment business object with unstructured content

Unstructured business objects have the following attributes:

Table 9. Unstructured business object attributes

Attribute name	Value
Content type	Type of content being sent. For example, text/xml, application/binary, or image/jpeg.
AsText	Value to be sent as e-mail text
AsBinary	Value to be sent as binary data

User-defined business object structure

Like the Email business object structure, the user-defined business object structure consists of attributes that directly relate to the fields in an e-mail message and child business objects for e-mail attachments and headers. However, where the Email business object structure can contain child objects of any type, the user-defined business object structure requires that user knows the structure of all e-mails being sent or received by the adapter in advance. For example, if all incoming and outgoing e-mails contain mail content of customer type, attachment1 of account type, and attachement2 of account type, as shown in Figure 76 on page 125.

By selecting the user-defined data type in the external service wizard, you can define your own user-defined wrapper business object. By doing this, you can use ordinary mapping tools to consume and work with your business objects without having to determine the business object type at run time.

The following illustration shows an example of a user-defined business object with Order, Customer, and Account child business objects.

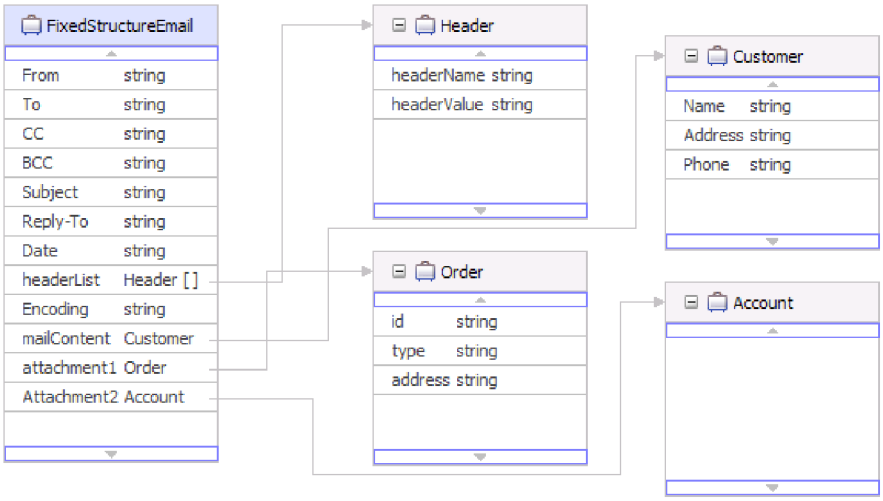


Figure 76. Fixed structure business object structure with child objects

Supported operations

Each business object is associated with an operation, such as create. Operations may be stored in a business graph, which is like an enhanced business object, if you choose to use business graphs. Each operation tells the adapter what to do with the business object. For outbound communications, there are three different create operations used to create various types of business objects from the content of an e-mail. For inbound communications, only the emit e-mail operation is supported.

Create Email

In the external service wizard, you specify a name for the operation. This name can be anything meaningful to you, such as SendEmail or SendEmailwithBO. The operations listed below represent the three examples of types of outbound create options the adapter is capable of invoking. The emit operation is always used for inbound communications, as it is the only supported inbound operation.

The create e-mail operation is used in conjunction with the Email business object. When invoked, the create e-mail operation creates an e-mail message from the attributes in the Email business object.

Create address

The create address operation is used when the adapter creates an e-mail from a fixed structure business object structure that includes an address business object.

Create customer

The create customer operation is used when the adapter creates an e-mail from a fixed structure business object structure that includes a customer business object.

Emit Email

For inbound communications, emit e-mail is the only supported operation. When invoked, this operation instructs the adapter to take information from an e-mail and convert it to representative business objects.

Naming conventions

When the external service wizard generates a business object, it provides a name for the business object based on the business object schema file (XSD file) name.

When the external service wizard provides the business object name, it converts the name of the object to mixed case, which means that it removes any separators, such as spaces or underscores, and then capitalizes the first letter of each word. For example, if the external service wizard uses a mail server object called CUSTOMER_ADDRESS to generate a business object, it generates a business object called CustomerAddress.

The generated business object name can indicate the structure of the business object. Names are derived during the metadata import process and are the same as the name given by the user to the pre-generated XSDs files. Business objects names have no semantic value to the adapter. This means that if you change the business object name, the behavior of the business object remains the same.

Important: If you choose to rename a business object, use the refactoring functionality in WebSphere Integration Developer to ensure that you update all of the business object dependencies. For instructions on using refactoring to rename business objects, refer to the following link: http://publib.boulder.ibm.com/infocenter/dmndhelp/v6rxmx/topic/com.ibm.wbit.help.refactor.doc/topics/trenameboatt.html.

Business graphs take the name of the business object followed by ″BG″. For example, a customer business object's business graph would be called CustomerBG.

Note: Business graph generation is optional.

Email business object properties

During external service discovery, the adapter generates the Email business object. This parent business object includes all of the header, encoding, and mail content details that the adapter needs to process both inbound and outbound requests.

The following table lists the attributes of the Email business object. For the simple alert e-mail business object structure, a number of header fields (such as To and From) are part of the Email wrapper business object that aren't part of the Email wrapper business object with other business object structures (such as the generic e-mail data type). For this reason, all of the header values available in the simple alert e-mail wrapper business object are not listed in this topic. A list and description for each of the properties available in the simple alert e-mail version of the wrapper business object are available in the section devoted to header business object properties in this reference documentation.

Each property available with all versions of the Email business object is described completely in the sections that follow the table.

Note: In business object attributes, the use of the [] symbol denotes an array of values.

Table 10. Email business object attributes

Business object attribute name	Description
Encoding	Contains outbound data encoding information when you do not use data transformation
File references	Contains the list of files that need to be attached to an outbound e-mail
Header list	Contains header details for all of the headers listed in a inbound e-mail request
Mail attachments	Stores the content for the attachments of an e-mail
Mail content	Stores the content for the body of an e-mail. This does not include e-mail attachments.

Encoding

This attribute is set during outbound communications to indicate the type of character encoding the adapter will use during data transformation.

Table 11. Encoding details

Required	No
Default	No default value
Attribute type	String
Usage	Encoding is used for headers, mail content, and attachment business objects
Example	Ascii for character encoding based on the English alphabet Big5 for character encoding based on traditional Chinese characters
Globalized	No
Bidi supported	No

File references

This attribute contains a list of files that need to be attached to an outbound e-mail. This attribute is not used during inbound processing.

Table 12. File references details

Required	No
Default	No default value
Attribute type	String []
Usage	During outbound communications, the run time specifies absolute paths for the referenced files listed in this field. The adapter reads these files, which are located on the local system with the adapter, and includes them as attachments to the outbound e-mail.
Globalized	Yes
Bidi supported	No

Header List

This attribute is populated with the header details for all of the headers listed in a polled e-mail request.

Table 13. Header list details

Required	No
Default	No default value
Attribute type	Header[]
Usage	Headers are the fields in an e-mail, such as To, From, Cc, Bcc, and Subject.
Globalized	Yes
Bidi supported	Yes

Mail attachments

This attribute stores the content details for an attachment in an inbound e-mail request.

Table 14. Mail attachments details

Required	No
Default	No default value
Attribute type	MailAttachment[]
Usage	Stores the content details for an attachment in an inbound e-mail request
Globalized	Yes
Bidi supported	No

Mail content

During inbound communications, this attribute stores any content found in the body of the e-mail request. During outbound communication, this attribute contains the data that will become the body of the e-mail being sent to the mail server. This does not include e-mail attachments.

Table 15. Mail content details

Required	Yes
Default	No default value
Attribute type	anyType
Usage	Contains body content of an e-mail
Globalized	Yes
Bidi supported	No

Header business object properties

Header business object properties are used to store standard (RFC822) e-mail headers as well as headers customized by you. They are populated dynamically by the adapter and comprise a name and value pair. Customized headers and their related information are tracked by the adapter with the help of the headerList entries in the Email business object.

The adapter picks up the header name from the HeaderList property in the Email business object. Each header can have multiple values, but Bcc and Resent-bcc headers cannot be retrieved from an e-mail. However, they can be sent on an e-mail.

All headers are encoded by the adapter in the specified character set. Because To and From header values are required, the adapter will end the outbound Create operation if the encoding of either of those header values fails. The Java Mail API does not provide enough information to decipher the character set and encoding information for the header content; hence header content might not be globalized

The following table provides example header business object name and value pairs.

Table 16. Examples of header business object name and value pairs

Name	Value
HeaderName = to	HeaderValue = abc@xyz.com
HeaderName = cc	HeaderValue = def@xyz.com
HeaderName = mimetype	HeaderValue = text/plain

The following table lists the Standard Email Headers supported by the adapter. A more detailed description of each property is provided in the sections that follow the table. For more information about how to read the property detail tables in the sections that follow, see Guide to information about properties.

Table 17. Standard Email Headers supported by the adapter

Property name	Description
Bcc	The blind carbon copy addresses for the e-mail
Cc	The e-mail addresses for secondary recipients of the e-mail
Comments	Specifies whether text comments can be added to the message body
Date	The date the e-mail was created
Encrypted	Specifies whether the body of a message was encrypted by the sender
From	The address that the e-mail was sent from
In reply to	Subject line of previous correspondence that the e-mail message is responding to
Keywords	Keywords or phrases contained in the e-mail separated by commas
Message identifier	The unique identifier (local-part address unit) referring to the particular version of a particular message
References	Other pieces of e-mail correspondence referenced by this e-mail
Reply to	Addresses where responses to the e-mail will be sent
Resent - bcc	Blind carbon copy addresses for the e-mail
Resent - cc	E-mail addresses for secondary or informational recipients of the e-mail
Resent - date	The date the e-mail was forwarded
Resent - from	The address that the e-mail was resent from
Resent - message identifier	The unique identifier (local-part address unit) that refers explicitly to a particular version of a particular message
Resent - reply to	Addresses where responses to the e-mail will be sent
Resent - sender	Authenticated identity of the agent (person, system, or process) sending the e-mail message
Resent - to	Addresses for the primary recipients of the e-mail
Sender	Authenticated identity of the agent (person, system, or process) sending the e-mail message
Subject	Summary of what the e-mail is about
To	Addresses for the primary recipients of the e-mail

Blind carbon copy (Bcc)

This property specifies blind carbon copy addresses for the e-mail. The addresses listed in this field are not included in copies of the message sent to the primary and secondary recipients.

Table 18. Blind carbon copy details

Required	No
Default	No default value
Property type	String
Usage	This header is only supported for outbound communications. Some systems choose to include the text of the Bcc field only in the author's copy, while some systems include these addresses to all those recipients listed in the Bcc field.
Globalized	Yes
Bidi supported	Yes

Carbon copy (Cc)

This property specifies the e-mail addresses of secondary recipients of the e-mail.

Table 19. Carbon copy details

Required	No
Default	No default value
Property type	String
Usage	Specifies e-mail addresses of secondary recipients of the e-mail. All recipients listed in this field will be visible to anyone receiving the e-mail.
Globalized	Yes
Bidi supported	Yes

Comments

This property permits the addition of text comments to the message body without disturbing the message body content.

Table 20. Comments details

Required	No
Default	No default value
Property type	String
Usage	Permits the addition of text comments to the message body without disturbing the message body content
Bidi supported	No

Date

The date set by the sender's mail server during inbound processing. The date the e-mail is created during outbound processing.

Table 21. Date details

Required	No
Default	No default value
Property type	String
Usage	The date set by the sender's mail server during inbound processing. The date the e-mail is created during outbound processing.
Globalized	Yes
Bidi supported	Yes

Encrypted

This property indicates whether the body of a message was encrypted by the sender. If set to `True`, the message was encrypted.

Table 22. Encrypted details

Required	No
Default	No default value
Property type	String
Usage	Setting the encrypted header value to `True` does not enable encryption. This merely notes whether the message has been encrypted for informational purposes.
Bidi supported	No

From

This property specifies the address that the e-mail was sent from.

Table 23. From details

Required	Yes
Default	No default value
Property type	String
Usage	Specifies the address that the e-mail was sent from
Globalized	Yes
Bidi supported	Yes

In reply to

The contents of this field identify which piece of previous correspondence is being answered with a new e-mail message.

Table 24. In reply to details

Required	No
Default	No default value
Property type	String
Usage	Identifies which piece of previous correspondence is being answered with a new e-mail message
Bidi supported	No

Keywords

This property specifies keywords or phrases contained in the e-mail, which are separated by commas.

Table 25. Keywords details

Required	No
Default	No default value
Property type	String
Usage	Keywords specified using this field are used during selective polling
Bidi supported	No

Message Identifier (Message ID)

This property specifies the unique identifier (local-part address unit) that refers explicitly to a particular version of a particular message.

Table 26. Message ID details

Required	No
Default	No default value
Property type	String
Usage	Each revision of a given e-mail message is assigned a new message ID. The uniqueness of the message ID is guaranteed by the host system that generates it. It is machine readable and does not include any meaningful syntax for users.
Bidi supported	No

References

The contents of this field identify other pieces of e-mail correspondence referenced by the e-mail.

Table 27. References details

Required	No
Default	No default value
Property type	String
Usage	Identifies other pieces of e-mail correspondence referenced by the e-mail
Bidi supported	No

Reply to

This property specifies the addresses where responses to the e-mail will be sent.

Table 28. Reply to details

Required	No
Default	No default value
Property type	String
Usage	Specifies the addresses where responses to the e-mail will be sent
Bidi supported	No

Resent - blind carbon copy (Resent-bcc)

This property specifies the blind carbon copy addresses for the e-mail.

Table 29. Resent-blind carbon copy details

Required	No
Default	No default value
Property type	String
Usage	This value is only supported during outbound communications. The addresses listed in this field are not included in copies of the message sent to the primary and secondary recipients. Some systems choose to include the text of the Bcc field only in the author's copy, while some systems include these addresses to all those recipients listed in the Bcc field.
Bidi supported	No

Resent - carbon copy (Resent-cc)

This property specifies the e-mail addresses for secondary recipients of the e-mail.

Table 30. Resent-carbon copy details

Required	No
Default	No default value
Property type	String
Usage	Specifies the e-mail addresses for secondary recipients of the e-mail
Bidi supported	No

Resent - date

This property specifies the date that the e-mail was forwarded.

Table 31. Resent - date details

Required	No
Default	No default value
Property type	String
Usage	Specifies the date that the e-mail was forwarded
Bidi supported	No

Resent - from

This property specifies the address that the e-mail was resent from.

Table 32. Resent - from details

Required	No
Default	No default value
Property type	String
Usage	Specifies the address that the e-mail was resent from
Bidi supported	No

Resent message identifier (Resent-message-ID)

This property specifies the unique identifier (local-part address unit) that refers explicitly to a particular version of a particular message.

Table 33. Resent-message-ID details

Required	No
Default	No default value
Property type	String
Usage	Each revised e-mail message is assigned a new message ID. The uniqueness of the message ID is guaranteed by the host system that generates it. It is machine readable and does not include any meaningful syntax for users.
Bidi supported	No

Resent - reply to

This property specifies the addresses where responses to the e-mail will be sent.

Table 34. Resent reply to details

Required	No
Default	No default value
Property type	String
Usage	Specifies the addresses where responses to the e-mail will be sent
Bidi supported	No

Resent - sender

This property specifies the authenticated identity of the agent (person, system, or process) that is sending the e-mail message.

Table 35. Resent sender details

Required	No
Default	No default value
Property type	String
Usage	Specifies the authenticated identity of the agent (person, system, or process) that is sending the e-mail message
Bidi supported	No

Resent - to

This field contains the addresses for the primary recipients of the e-mail.

Table 36. Resent - to details

Required	No
Default	No default value
Property type	String
Usage	Contains the addresses for the primary recipients of the e-mail
Bidi supported	No

Sender

This property specifies the authenticated identity of the agent the (person, system, or process) that is sending the e-mail message.

Table 37. Sender details

Required	No
Default	No default value
Property type	String
Usage	Specifies the authenticated identity of the agent the (person, system, or process) that is sending the e-mail message
Bidi supported	No

Subject

This property contains a summary of what the e-mail is about.

Table 38. Subject details

Required	No
Default	No default value
Property type	String
Usage	Contains a summary of what the e-mail is about
Globalized	Yes
Bidi supported	Yes

To

This field contains the addresses for the primary recipients of the e-mail.

Table 39. To details

Required	No
Default	No default value
Property type	String
Usage	Contains the addresses for the primary recipients of the e-mail
Globalized	Yes
Bidi supported	Yes

Mail attachment business object properties

Each e-mail attachment is stored in its own Mail Attachment object. Mail Attachment business objects consist of an attachment name and one e-mail attachment's worth of data.

During inbound processing, the attachments are parsed and the contents sent out as business objects. By default, each attachment is parsed into one MailAttachment business object. However, you can elect to emit the entire e-mail as a single Email business object by setting the activation specification property Emit individual business objects from a multipart e-mail to false in the external service wizard.

During outbound processing, WebSphere Process Server sets the data within the MailAttachment business object. The data in this business object then becomes an e-mail attachment when the e-mail message is created by the adapter.

Note: MailAttachment objects can store e-mail attachments of any user-defined type (such as Customer or PurchaseOrder).

The following table describes the attribute values for the mail attachment business object. A more detailed description of each property is provided in the sections that follow the table. For more information about how to read the property detail tables in the sections that follow, see Guide to information about properties.

Table 40. MailAattachment business object attribute values

Attribute name	Purpose
"Attachment name"	The name of the e-mail attachment
"Application business object data (AppBOData)"	Data contained in the e-mail attachment.

Attachment name

This attribute value specifies the name of the file attached to the e-mail.

Table 41. Attachment name attribute characteristics

Required	Yes
Default	No default value
Attribute type	String
Usage	The fully qualified path of the e-mail attachment
Globalized	Yes
Bidi supported	No

Application business object data (AppBOData)

This attribute comprises the data in the file attached to the e-mail.

Table 42. Application business object data attribute characteristics

Required	Yes
Default	No default value
Attribute type	anyType
Usage	The anyType attribute type can hold hexBinary content or a child business-object. For hexBinary type, the data binding deciphers the data and converts it to an unstructured content business object.
Globalized	Yes
Bidi supported	No

Event store structure

Each time an e-mail is read by the adapter during inbound communications, the adapter updates the status of the event in an event store. The status of each event is continually updated by the adapter for recovery purposes until the events are delivered to a configured export on the run time.

When event persistence is optionally configured, the adapter implements the event store in an Email-specific relational table called EmailEventTable. This table is tied to event recovery operations. When event persistence is not configured, the adapter determines which events need to be recovered based on the e-mails present in the staging directory. The event recovery feature is activated when the adapter terminates abruptly. Upon termination, events that are still being processed, or have been processed but not completely posted to the service, still require completion. The adapter reads the event store to determine which events still need to be processed and then facilitates their completion. The event persistence framework takes care of delivering the event only once to the target service.

Each inbound module has a unique connection and is associated with one event store. Multiple modules pointing to the same event store is not supported

The following table illustrates the structure of the WebSphere Adapter for Email event store.

Table 43. Email adapter event table structure

Column name	Property type	Description
EVNTID	Varchar (255)	The event ID associated with the polled inbound event. The ID is taken from the message ID of the polled e-mail.
EVNTSTAT	Integer	The status of the event as it moves through the system. Valid values are `NEW` and `INPROGRESS`. An event is logged in the event store as `NEW` when the adapter discovers a new e-mail on the mail server that meets the specified search criteria noted in the activation specification properties. When the adapter copies an event from the mail server to the local system in RFC822 format, it is logged in the event table as `INPROGRESS`.
XID	Varchar (255)	The XID. It is used by the adapter for assured event delivery and recovery.
BQTOTAL	Integer	Not used by the adapter.
BQPROC	Integer	Not used by the adapter.
EVNTDATA	Varchar (255)	Stores the name of the folder on the mail server where the e-mail event was polled.

Outbound configuration properties

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

Guide to information about properties

The properties used to configure WebSphere Adapter for Email 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 will process the field using its assigned default value, and that default value will also be 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.
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 the following: • Boolean • String • Integer

Row	Explanation
Usage	Describes usage conditions or restrictions that might apply to the property. For instance, here is how a restriction would be documented: For WebSphere Application Server version 6.40 or earlier, the password: • Must be uppercase • Must be 8 characters in length For versions of WebSphere Application Server 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 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), Codepage 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 pertains to the task of processing data that contains both left-to-right (Hebrew or Arabic, for example) and right-to-left (a URL or file path, for example) semantic content within the same file. Valid values are **Yes** and **No**.

Connection properties for the external service wizard

Enterprise service discovery selection properties are used to build a service description and to save the built-in artifacts. These properties are configured in the external service wizard.

The following table lists the connection properties for the external service wizard. These can only be configured using the external service wizard and cannot be changed after deployment. A more detailed 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

Table 44. Connection properties for the external service wizard

In the wizard	Description
Adapter style	Service type associated with the module
Business object type location	Absolute path for the folder on the local drive where business objects generated by the external service wizard are stored
Function selector	The name of the function selector configuration during inbound communication
Operation name	Operation defined in the external service wizard

Adapter style

This property specifies the service type associated with the module.

Table 45. Service type details

Required	Yes
Default	Outbound
Property type	List of values
Possible values	`Outbound` `Inbound`
Usage	Specifies the service type associated with the adapter module
Globalized	No
Bidi supported	No

Business object type location

This property specifies the absolute path of the folder on the local drive where business objects generated by the external service wizard are stored.

Table 46. Business object type location details

Required	No
Default	No default value
Property type	String
Usage	Specifies the absolute path of the folder on the local drive where business objects generated by the external service wizard are stored
Globalized	No
Bidi supported	No

Function selector

This property specifies the name of the function selector implementation when the service type is inbound.

Table 47. Function selector details

Required	When the service type is set to inbound, this property is required. When the service type is set to outbound, this property is not valid.
Default	For inbound processing, the default is `EmailFunctionSelector`. For outbound processing, this field is not editable and there is no default.
Property type	String
Usage	There is no equivalent property for outbound communication.
Globalized	No
Bidi supported	(Not available)

Operation name

This property specifies the name you give to the operation being used with this module.

Table 48. Operation name property details

Required	Yes

Table 48. Operation name property details (continued)

Default	No default value
Property type	String
Usage	This value is user-defined and should be meaningful to you.
Example	SendEmail SendCustomerBO
Globalized	No
Bidi supported	(Not available)

Managed connection factory properties

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

The following table lists and describes the managed connection factory properties for outbound communication. You set managed connection factory properties using theexternal service wizard and can change them using the WebSphere Integration Developer Assembly Editor before deployment. After deployment, you can change these values using the WebSphere Process Server administrative console.

A more detailed 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.

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 49. Managed connection factory properties

In the wizard	In the administrative console	Description
Bidi format string	BIDIContextEIS	The bidi format for string type business data exchanged between the mail server and the adapter
Host name	HostName	The IP address of the host where the mail server is running
Password	Password	The password for the user name associated with the mail server
Port	Port	The SMTP port where the mail server is listening
Protocol	Protocol	The protocol used for outbound communication with the mail server
Secure connection	enableSSL	Specifies whether secure socket layers are enabled for outbound communications
Select when antivirus or firewall software is running	closeConnection	Specifies whether the adapter will close the managed connection with the mail server after each request. This is recommended when antivirus or firewall security software is running on the system where the adapter is deployed or the one that hosts the e-mail server.
User name	UserName	The user name for the mail server used to send outbound e-mails

Bidi format string (BIDIContextEIS)

This property indicates the bidi format for string type business data exchanged between the mail server and the adapter.

Table 50. Bidi format string details

Required	No
Possible values	WebSphere Process Server and WebSphere Enterprise Service Bus use ILYNN (implicit, left-to-right, on, off, nominal). These five attributes comprise the format used by Windows.
Default	No default value
Property type	String
Usage	5 letter long string If an application or file system that sends or receives data from the server uses a different format than ILYNN, the adapter converts the format prior to introducing the data to the server. For the conversion to occur, you use the external service wizard to set attribute values that represent the bidirectional format used by the sending application or file system. This is done when you deploy the module for the first time.
Example	ILYNN or VRYNN or VLYNN
Globalized	No
Bidi supported	No

Host name (HostName)

This property specifies the IP address of the host where the mail server is running.

Table 51. Host name details

Required	No
Default	`localhost`
Property type	String
Usage	Specifies the IP address of the host where the mail server is running
Globalized	No
Bidi supported	No

Password (Password)

This property specifies the password for the user name associated with the mail server.

Table 52. Password details

Required	No
Default	No default value
Property type	String
Usage	Authenticates the outbound SMTP session with the mail server WebSphere Process Server administrative console does not encrypt the Password property the first time.
Globalized	No

Table 52. Password details (continued)

Bidi supported	Yes

Port (Port)

This property specifies the SMTP port where the mail server is listening.

Table 53. Port details

Required	No
Default	`25`
Property type	Integer
Usage	If the Secure connection (SSL) property is set to `True`, this property needs to be updated.
Globalized	No
Bidi supported	No

Protocol (Protocol)

This property specifies the protocol to be used for outbound communications with the mail server.

Table 54. Protocol details

Required	No
Default	`SMTP`
Property type	String
Usage	SMTP is the only supported value for this property.
Globalized	Yes
Bidi supported	No

Secure connection (SSL) (enableSSL)

This property specifies whether secure socket layers are enabled for outbound communications.

Table 55. Enable secure socket layers details

Required	No
Default	False
Property type	Boolean
Usage	If set to `True`, the port property must be set to `465`.
Globalized	No
Bidi supported	No

Select when antivirus or firewall software is running (SecureConnection)

Selecting this option closes the managed connection with the mail server after each outbound request. It is recommended to use this when antivirus or firewall security software is running on the system where the adapter is deployed or the system that hosts the e-mail server.

Table 56. Select when antivirus or firewall software is running details

Required	No
Default	`True`
Property type	Boolean
Possible values	`True` `False`
Usage	This property has been provided because some antivirus programs consider the managed connection between the adapter and the mail server malicious. This results in the mail sent by the adapter to the mail server being blocked by an antivirus program or firewall. If set to `True`, the adapter closes the managed connection after each outbound request, ensuring that antivirus programs and firewalls will not block e-mails from the adapter. If set to `False`, the adapter does not close the managed connection after each outbound request. This setting might cause antivirus programs and firewalls to block e-mails from the adapter.
Globalized	No
Bidi supported	No

User name (UserName)

This property specifies the user name for the mail server to be used with the outbound SMTP session.

Table 57. User name details

Required	No
Default	No default value
Property type	String
Usage	The mail server should be running on the host noted in this property.
Globalized	Yes
Bidi supported	Yes

Resource adapter properties

A resource adapter contains properties such as the adapter ID and logging and tracing options specific to the adapter. You can set the logging and tracing properties using the external service wizard during adapter configuration. You can set or change any of the properties using the administrative console.

The following table lists and describes the resource adapter properties. A more detailed description of each property is provided in property details tables 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.

Table 58. Resource adapter properties

In the wizard	In the administrative console	Description
Adapter ID	AdapterID	Identifies the adapter instance for CEI and PMI events with respect to logging and tracing.
(Not available)	Enable HA support	Do not change this property.

Adapter ID to use for logging and tracing (AdapterID)

Use this property to identify a specific deployment, or instance, of the adapter.

Table 59. Adapter ID to use for logging and tracing details

Required	Yes
Default	CWYEM_Email
Property type	String
Usage	This property is used to identify the adapter instance for PMI events. If you are deploying multiple instances of an adapter, set this property to a unique value for each adapter instance. For inbound processing this property is retrieved from the resource adapter properties. For outbound processing, it is retrieved form the managed connection factory properties.
Globalized	Yes
Bidi supported	No

Enable high availability support (enableHASupport)

Do not change this property. It must be set to `true`.

Interaction specification properties

Interaction specification properties specify business object details for a given data type selected in the external service wizard. When interaction specification values such as To or From addresses are set in the wizard, these values are automatically populated in the business objects created in association with the module.

The following table lists the Interaction specification properties. A complete description of each property is provided in the sections that follow the table.

Table 60. Interaction specification properties

In the wizard	Description
Blind carbon copy	Specifies blind carbon copy addresses for the e-mail
Carbon copy	Specifies e-mail addresses of secondary recipients of the e-mail
Date	The date set by the sender's mail server during inbound processing. The date the e-mail is created during outbound processing.
Encoding	This attribute is set during outbound communications to indicate the type of character encoding the adapter will use during data transformation.
From	Specifies the address that the e-mail was sent from
Password	Specifies the password for the user name associated with the mail server
Reply to	Specifies the addresses where responses to the e-mail will be sent
Subject	Contains a summary of what the e-mail is about
To	Contains the addresses for the primary recipients of the e-mail

Table 60. Interaction specification properties (continued)

User name	Specifies the user name for the mail server to be used for the outbound SMTP session

Blind carbon copy (Bcc)

This property specifies blind carbon copy addresses for the e-mail. The addresses listed in this field are not included in copies of the message sent to the primary and secondary recipients.

Table 61. Blind carbon copy details

Required	No
Default	No default value
Property type	String
Usage	This header is only supported for outbound communications. Some systems choose to include the text of the Bcc field only in the author's copy, while some systems include these addresses to all those recipients listed in the Bcc field.
Globalized	Yes
Bidi supported	Yes

Carbon copy (Cc)

This property specifies the e-mail addresses of secondary recipients of the e-mail.

Table 62. Carbon copy details

Required	No
Default	No default value
Property type	String
Usage	Specifies e-mail addresses of secondary recipients of the e-mail. All recipients listed in this field will be visible to anyone receiving the e-mail.
Globalized	Yes
Bidi supported	Yes

Date

The date set by the sender's mail server during inbound processing. The date the e-mail is created during outbound processing.

Table 63. Date details

Required	No
Default	No default value
Property type	String
Usage	The date set by the sender's mail server during inbound processing. The date the e-mail is created during outbound processing.
Globalized	Yes
Bidi supported	Yes

Encoding

This attribute is set during outbound communications to indicate the type of character encoding the adapter will use during data transformation.

Table 64. Encoding details

Required	No
Default	No default value
Attribute type	String
Usage	Encoding is used for headers, mail content, and attachment business objects
Example	Ascii for character encoding based on the English alphabet Big5 for character encoding based on traditional Chinese characters
Globalized	No
Bidi supported	No

From

This property specifies the address that the e-mail was sent from.

Table 65. From details

Required	Yes
Default	No default value
Property type	String
Usage	Specifies the address that the e-mail was sent from
Globalized	Yes
Bidi supported	Yes

Password (Password)

This property specifies the password for the user name associated with the mail server.

Table 66. Password details

Required	Yes
Default	No default value
Property type	String
Usage	Authenticates the inbound POP3 or IMAP session with the mail server
Globalized	Yes
Bidi supported	Yes

Reply to

This property specifies the addresses where responses to the e-mail will be sent.

Table 67. Reply to details

Required	No
Default	No default value

Table 67. Reply to details (continued)

Property type	String
Usage	Specifies the addresses where responses to the e-mail will be sent
Bidi supported	No

Subject

This property contains a summary of what the e-mail is about.

Table 68. Subject details

Required	No
Default	No default value
Property type	String
Usage	Contains a summary of what the e-mail is about
Globalized	Yes
Bidi supported	Yes

To

This field contains the addresses for the primary recipients of the e-mail.

Table 69. To details

Required	No
Default	No default value
Property type	String
Usage	Contains the addresses for the primary recipients of the e-mail
Globalized	Yes
Bidi supported	Yes

User name (UserName)

This property specifies the user name for the mail server to be used for the outbound SMTP session.

Table 70. User name details

Required	Yes
Default	No default value
Property type	String
Usage	This property specifies the user name for the mail server to be used for the outbound SMTP session
Globalized	Yes
Bidi supported	Yes

Inbound configuration properties

WebSphere Adapter for Email has several categories of inbound 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 activation specification properties after you deploy the module using WebSphere Integration Developer or the WebSphere Process Server administrative console, but connection properties for the external service wizard cannot be changed after deployment.

Guide to information about properties

The properties used to configure WebSphere Adapter for Email 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 will process the field using its assigned default value, and that default value will also be 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.
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 the following: • Boolean • String • Integer

Row	Explanation
Usage	Describes usage conditions or restrictions that might apply to the property. For instance, here is how a restriction would be documented: For WebSphere Application Server version 6.40 or earlier, the password: • Must be uppercase • Must be 8 characters in length For versions of WebSphere Application Server 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 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), Codepage 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 pertains to the task of processing data that contains both left-to-right (Hebrew or Arabic, for example) and right-to-left (a URL or file path, for example) semantic content within the same file. Valid values are **Yes** and **No**.

Connection properties for the external service wizard

Enterprise service discovery selection properties are used to build a service description and to save the built-in artifacts. These properties are configured in the external service wizard.

The following table lists the connection properties for the external service wizard. These can only be configured using the external service wizard and cannot be changed after deployment. A more detailed 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

Table 71. Connection properties for the external service wizard

In the wizard	Description
Adapter style	Service type associated with the module
Business object type location	Absolute path for the folder on the local drive where business objects generated by the external service wizard are stored
Function selector	The name of the function selector configuration during inbound communication
Operation name	Operation defined in the external service wizard

Adapter style

This property specifies the service type associated with the module.

Table 72. Service type details

Required	Yes
Default	Outbound
Property type	List of values
Possible values	`Outbound` `Inbound`
Usage	Specifies the service type associated with the adapter module
Globalized	No
Bidi supported	No

Business object type location

This property specifies the absolute path of the folder on the local drive where business objects generated by the external service wizard are stored.

Table 73. Business object type location details

Required	No
Default	No default value
Property type	String
Usage	Specifies the absolute path of the folder on the local drive where business objects generated by the external service wizard are stored
Globalized	No
Bidi supported	No

Function selector

This property specifies the name of the function selector implementation when the service type is inbound.

Table 74. Function selector details

Required	When the service type is set to inbound, this property is required. When the service type is set to outbound, this property is not valid.
Default	For inbound processing, the default is `EmailFunctionSelector`. For outbound processing, this field is not editable and there is no default.
Property type	String
Usage	There is no equivalent property for outbound communication.
Globalized	No
Bidi supported	(Not available)

Operation name

This property specifies the name you give to the operation being used with this module.

Table 75. Operation name property details

Required	Yes

Table 75. Operation name property details (continued)

Default	No default value
Property type	String
Usage	This value is user-defined and should be meaningful to you.
Example	SendEmail SendCustomerBO
Globalized	No
Bidi supported	(Not available)

Activation specification properties

Activation specification properties are properties that hold the inbound event processing configuration information for an export.

The following table lists the activation specification properties for inbound communication. You set the activation specification properties using the external service wizard and can change them before deployment using the WebSphere Integration Developer Assembly Editor. After deployment, you can change these values using the WebSphere Process Server administrative console.

A more detailed description of each property is provided in the sections that follow the table. For information about how to read the property detail tables in the sections that follow, see Guide to information about properties.

Table 76. Activation specification properties

In the wizard	In the administrative console	Description
Archive file naming pattern	ArchiveFileNamingPattern	A comma delimited pattern of header names used to name archived files being stored in the archive folder
Archive folder	ArchiveFolder	The file folder on the local system where successfully processed e-mails are archived as files
Automatically create event table	EP_CreateTable	Specifies whether the adapter should create an event table if it detects one does not exist
Bidi format string	BIDIContextEIS	Indicates the bidi format for string type business data exchanged between the mail server and the adapter
Database schema name	EP_SchemaName	The schema name for the database used by the adapter's event persistence feature
Delivery type	DeliveryType	Determines the order in which events are delivered by the adapter to the export
Do not process events that have a timestamp in the future	FilterFutureEvents	Specifies whether the adapter filters out future events by comparing the timestamp on each event with the system time
Emit individual business objects from a multipart e-mail	EmitIndividualBOs	Specifies whether the adapter will create individual business objects for each part of a multipart e-mail
Enable transport security (SSL)	enableSSL	Specifies whether a secure socket layer (SSL) connection is enabled
Ensure once-only event delivery	AssuredOnceDelivery	Specifies whether the adapter provides assured once delivery of events

Table 76. Activation specification properties (continued)

In the wizard	In the administrative console	Description
Event recovery data source (JNDI) name	EP_DataSource_JNDIName	The JNDI name of the data source used by the event persistence class to acquire the JDBC database connection
Event recovery table name	EP_TableName	The name of the event store used by the adapter for event persistence
Event types to process	EventTypeFilter	A delimited list of event types that indicates to the adapter which events it should deliver
Failed events folder	FailedEventsFolder	The absolute path to the file folder on the local system where unsuccessfully processed e-mail events are archived in file format
Host name	HostName	The IP address of the host where the mail server is running.
Interval between polling periods	PollPeriod	The length of time that the adapter waits between polling periods
Match all search criteria	MatchAllSearchCriteria	The search criteria to filter which events are polled from the mail server
Match some search criteria	MatchSomeSearchCriteria	The search criteria to filter which events are polled from the mail server.
Maximum events in polling period	PollQuantity	The number of events that the adapter delivers to the export during each poll period
Maximum connections	MaximumConnections	The maximum number of connections that the adapter can use for inbound event delivery
Minimum connections	MinimumConnections	The minimum number of connections that the adapter can use for inbound event delivery
Number of times to retry the system connection	RetryLimit	The number of times the adapter tries to reestablish an inbound connection after an error
Password	Password	The password associated with the mail server user name
Password used to connect to event data source	EP_Password	The password used by the adapter's event persistence feature. It is used to acquire the JDBC database connection from the data source configured in WebSphere Process Server.
Poll folder	Poll folder	The name of the mail folder or mail folders the adapter polls for inbound requests (e-mails)
Port	Port	The POP3 or IMAP port where the mail server is listening
Protocol	Protocol	The protocol adapter uses for inbound communication with the mail server
Retry interval if connection fails	RetryInterval	The length of time that the adapter waits between attempts to establish a new connection after an error during inbound operations
Staging directory	InProgressFolder	The folder on the file system where e-mails polled from the mail server are first written in file format
Stop polling on error	StopPollingOnError	Specifies whether the adapter stops polling for events when it encounters an error during polling

Table 76. Activation specification properties (continued)

In the wizard	In the administrative console	Description
(Not available)	"UseFiveLevelBO" on page 165	Specifies whether business graphs and wrappers are generated for child business objects of the Email parent business object
User name	UserName	The user name for the mail server
User name used to connect to event data source	EP_UserName	The user name used by the adapter's event persistence feature. It is used to acquire the JDBC database connection from the data source specified in WebSphere Process Server.

Archive file naming pattern (ArchiveFile)

This property is used to specify a comma delimited pattern of header names used to name archived files being stored in the archive folder.

Table 77. Archive file naming pattern details

Required	No
Default	The message-ID of the e-mail event. This is retrieved from the e-mail header.
Property type	String
Usage	This property should be used in conjunction with the "Archive folder (ArchiveFolder)" property.
Example	If the header values `From, Date` are specified, the adapter will pick the from address and date from the e-mail headers and combine them with the message ID to form the file name (From name + Date + Message ID).
Globalized	Yes
Bidi supported	No

Archive folder (ArchiveFolder)

This property specifies the file folder on the local system where successfully processed e-mails are archived in RFC822 file format.

Table 78. Archive folder details

Required	No
Default	No default value
Property type	String
Usage	This folder must be manually created on the same system as the adapter before the adapter is run. If no archive folder is specified, the adapter does not archive successfully e-mails. They are deleted from the in progress folder.
Globalized	Yes
Bidi supported	Yes

Automatically create event table (EP_CreateTable)

This property specifies whether the adapter should create an event store if it detects one does not exist.

Table 79. Automatically create event table details

Required	No
Possible values	Checkbox selected is `True` Checkbox unselected is `False`
Default	`True`
Property type	Boolean
Usage	If set to `True`, the adapter will create an event store if it detects one does not exist. If set to `False`, the adapter will not create an event store even if one does not already exist.
Globalized	Not available
Bidi supported	Yes

Bidi format string (BIDIContextEIS)

This property indicates the bidi format for string type business data exchanged between the mail server and the adapter.

Table 80. Bidi format string details

Required	No
Possible values	WebSphere Process Server and WebSphere Enterprise Service Bus use ILYNN (implicit, left-to-right, on, off, nominal). These five attributes comprise the format used by Windows.
Default	No default value
Property type	String
Usage	5 letter long string If an application or file system that sends or receives data from the server uses a different format than ILYNN, the adapter converts the format prior to introducing the data to the server. For the conversion to occur, you use the external service wizard to set attribute values that represent the bidirectional format used by the sending application or file system. This is done when you deploy the module for the first time.
Example	ILYNN or VRYNN or VLYNN
Globalized	No
Bidi supported	No

Database schema name (EP_SchemaName)

This property specifies the schema name for the database used by the adapter's event persistence feature.

Table 81. Database schema name details

Required	No
Default	No default value
Property type	String
Usage	Specifies the schema name for the database used by the adapters event persistence feature
Globalized	Yes
Bidi supported	Yes

Delivery type (DeliveryType)

This property specifies the order in which events are delivered by the adapter to the export.

Table 82. Delivery type details

Required	No
Possible values	`ORDERED` `UNORDERED`
Default	`ORDERED`
Property type	String
Usage	The following values are supported: • `ORDERED`: The adapter delivers events to the export one at a time. • `UNORDERED`: The adapter delivers all events to the export at once.
Globalized	No
Bidi supported	No

Do not process events that have a timestamp in the future (FilterFutureEvents)

This property specifies whether the adapter filters out future events by comparing the timestamp on each event with the system time.

Table 83. Do not process events that have a timestamp in the future details

Required	Yes
Possible values	`True` `False`
Default	`False`
Property type	Boolean
Usage	If set to `True`, the adapter compares the time of each event to the system time. If the event time is later than the system time, the event is not be delivered. If set to `False`, the adapter delivers all events.
Globalized	No
Bidi supported	No

Emit individual business objects from a multipart e-mail (EmitIndividualBOs)

This property specifies whether the adapter will create individual business objects for each part of a multipart e-mail.

Table 84. Emit individual business objects from a multipart e-mail details

Required	No
Default	False
Property type	Boolean
Usage	The split for individual business object is completed by the adapter and each of the business objects is emitted as generic Email (emitEmail). Each part of a multipart e-mail is considered an individual business object and emitted using the Email wrapper object, where each parts' content is set in the mail content attribute.

Table 84. Emit individual business objects from a multipart e-mail details (continued)

Globalized	(Not available)
Bidi supported	No

Enable transport security (SecureConnectionProperty)

This property specifies if the secure socket layer (SSL) connection is enabled for the POP3 or IMAP protocol chosen in the **Protocol** property.

Table 85. Enable transport security details

Required	No
Default	`False`
Property type	Boolean
Usage	If set to `True`, the port value needs to be set to one of the following values: For the POP3 protocol, `995` For the IMAP protocol, `993`
Globalized	No
Bidi supported	No

Ensure once-only event delivery (AssuredOnceDelivery)

This property specifies whether to provide ensure once-only event delivery for inbound events.

Table 86. Ensure once-only event delivery details

Required	Yes
Possible values	`True` `False`
Default	`True`
Property type	Boolean
Usage	When this property is set to `True`, the adapter provides assured once event delivery. This means that each event will be delivered once and only once. A value of `False` does not provide assured once event delivery, but provides better performance. When this property is set to `True`, the adapter attempts to store transaction (XID) information in the event store. If it is set to `False`, the adapter does not attempt to store the information. This property is used only if the export component is transactional. If it is not, no transaction can be used, regardless of the value of this property.
Globalized	No
Bidi supported	No

Event recovery data source (JNDI) name (EP_DataSource_JNDIName)

This property specifies the JNDI name of the data source that will be used by the event persistence class to acquire the JDBC database connection.

Table 87. Event recovery data source (JNDI) name details

Required	No

Table 87. Event recovery data source (JNDI) name details (continued)

Default	No default value
Property type	String
Usage	The data source must be created in WebSphere Process Server before this property can be specified in the external service wizard.
Globalized	Yes
Bidi supported	Yes

Event recovery table name (EP_TableName)

This property specifies the name of the event store that will be used by the adapter for event persistence.

Table 88. Event recovery table name details

Required	No
Default	EmailEventTable
Property type	String
Usage	If this table does not exist on the local system, the adapter will create a table using this name and use it. The value specified for this property must be unique for each adapter instance and cannot be used by another adapter.
Globalized	Yes
Bidi supported	Yes

Event types to process (EventTypeFilter)

This property contains a delimited list of event types that indicates to the adapter which events it should deliver.

Table 89. Event types to process details

Required	No
Possible values	A comma-delimited (,) list of business object types
Default	`null`
Property type	String
Usage	Events are filtered by business object type. If the property is set, the adapter delivers only those events that are in the list. A value of `null` indicates that no filter will be applied and that all events will be delivered to the export.
Example	To receive only events relating to the Customer and Order business objects, specify this value: `Customer,Order`
Globalized	No
Bidi supported	No

Failed events folder (FailedEventsFolder)

This property specifies the file folder on the local system where unsuccessfully processed e-mail events are archived in file format.

Table 90. Failed events folder details

Required	No
Default	No default value
Property type	String
Usage	This folder must be manually created on the same system as the adapter before the adapter is run. If no failed events folder is specified, the adapter does not archive unsuccessfully processed e-mail events.
Globalized	Yes
Bidi supported	No

Host name (HostName)

This property specifies the IP address of the host where the mail server is running.

Table 91. Host name details

Required	No
Default	`localhost`
Property type	String
Usage	Specifies the IP address of the host where the mail server is running
Globalized	No
Bidi supported	Yes

Interval between polling periods (PollPeriod)

This property specifies the length of time that the adapter waits between polling periods.

Table 92. Interval between polling periods details

Required	Yes
Possible values	Integers greater than or equal to `0`.
Default	`2000`
Unit of measure	Milliseconds
Property type	Integer
Usage	The poll period is established at a fixed rate, which means that if running the poll cycle is delayed for any reason (for example, if a prior poll cycle takes longer than expected to complete) the next poll cycle will occur immediately to make up for the lost time caused by the delay.
Globalized	No
Bidi supported	No

Match all search criteria (MatchAllCriteria)

If set, this property specifies search criteria that the adapter uses to filter which events are polled from designated poll folders on the mail server. Events that meet the ANDed conditions will be polled.

Table 93. Match all search criteria details

Required	No

Table 93. Match all search criteria details (continued)

Possible values	You can use any of the following header values when specifying search criteria: • content= • subject= • to= • cc= • from= • sender= • date=
Default	No default value. This means that you have not selected any filtering options.
Property type	String
Usage	Specify AND conditions by separating them with a comma (,). This will limit the event search to only mail events in the poll folder that meet the ANDed specific search criteria. Specify NOT conditions by separating them with an exclamation mark (!). This will limit the event search to only mail events in the poll folder that do not include the search options NOTed. If both **Match all search criteria** and **Match some criteria** properties are set, the adapter will use the AND operation between the fields. This means that the output of the first set of conditions will then be subjected to the second set of conditions. For example, if `sender=xyz@abc.com, to=pqr@abc.com` is set for **Match all search criteria** property and `subject=test, from!=lmn@abc.com` is set for **Match some search criteria** property, the adapter will search for events with a sender value of xyz@abc.com and a to value of pqr@abc.com that may also have a subject value of test and which does not have a from value of lmn@abc.com.
Example	`sender=xyz@abc.com,to=pqr@abc.com` will pick up any events with a sender value that matches `sender=xyz@abc.com` and a to value of `to=pqr@abc.com`. `sender=xyz@abc.com,to!=pqr@abc.com` will pick up any events with a sender value that matches `sender=xyz@abc.com` and does not have a to value of `pqr@abc.com`.
Globalized	No
Bidi supported	No

Match some search criteria (MatchSomeCriteria)

If set, this property specifies the search criteria the adapter uses to filter which events are polled from the designated poll folders on the mail server. Events that meet the ORed conditions will be polled.

Table 94. Match some search criteria details

Required	No
Possible values	You can use any of the following header values when specifying search criteria: • content= • subject= • to= • cc= • from= • sender= • date=
Default	Default is blank. This means that you have not selected any filtering options.
Property type	String

Table 94. Match some search criteria details (continued)

Usage	Specify OR conditions by separating them with a comma (,). This limits the event search to mail events in the poll folder that meet the ORed search criteria. Specify NOT conditions by separating them with an exclamation mark (!). This limits the event search to only mail events in the poll folder that do not include the search options NOTed. If both **Match all search criteria** and **Match some criteria** properties are set, the adapter will use the AND operation between the fields. This means that the output of the first set of conditions will then be subjected to the second set of conditions. For example, if `sender=xyz@abc.com, to=pqr@abc.com` is set for **Match all search criteria** property and `subject=test, from!=lmn@abc.com` is set for **Match some search criteria** property, the adapter will search for events with a sender value of xyz@abc.com and a to value of pqr@abc.com that may also have a subject value of test and which does not have a from value of lmn@abc.com.
Example	`sender=xyz@abc.com,to=pqr@abc.com` will pick up any events with a sender value that matches `sender=xyz@abc.com` and a to value of `to=pqr@abc.com`. `sender=xyz@abc.com,to!=pqr@abc.com` will pick up any events with a sender value that matches `sender=xyz@abc.com` and does not have a to value of `pqr@abc.com`.
Globalized	No
Bidi supported	No

Maximum connections (MaximumConnections)

This property specifies the maximum number of connections that the adapter can use for inbound event delivery.

Table 95. Maximum connections details

Required	No
Default	1
Property type	Integer
Usage	Only positive values are valid. The adapter considers any positive entry less than 1 to be equal to 1. Typing a negative value or 1 for this property may result in run time errors.
Globalized	No
Bidi supported	No

Minimum connections (MinimumConnections)

This property specifies the minimum number of connections that the adapter can use for inbound event delivery.

Table 96. Minimum connections details

Required	No
Default	1
Property type	Integer
Usage	Only positive values are valid. Any value less than 1 is treated as 1 by the adapter. Typing a negative value or 1 for this property may result in run time errors.
Globalized	No
Bidi supported	No

Maximum events in polling period (PollQuantity)

This property specifies the number of events that the adapter delivers to the export during each poll period.

Table 97. Maximum events in polling period details

Required	Yes
Default	10
Property type	Integer
Usage	The value must be greater than 0. If this value is increased, more events are processed per polling period and the adapter may perform less efficiently. If this value is decreased, less events are processed per polling period and the adapter's performance may improve slightly.
Globalized	No
Bidi supported	No

Number of times to retry the system connection (RetryLimit)

This property specifies the number of times the adapter tries to reestablish an inbound connection.

Table 98. Number of times to retry the system connection details

Required	No
Possible values	Positive integers
Default	0
Property type	Integer
Usage	Only positive values are valid. When the adapter encounters an error related to the inbound connection, this property specifies the number of times the adapter tries to restart the connection. A value of 0 indicates an infinite number of retries.
Globalized	Yes
Bidi supported	No

Password (Password)

This property specifies the password for the user name associated with the mail server.

Table 99. Password details

Required	Yes
Default	No default value
Property type	String
Usage	Authenticates the inbound POP3 or IMAP session with the mail server WebSphere Process Server administrative console does not encrypt the Password property the first time.
Globalized	Yes
Bidi supported	Yes

Password used to connect to the event data source (EP_Password)

This property specifies the password used by the adapter's event persistence feature.

Table 100. Password used to connect to the event data source details

Required	No
Default	No default value
Property type	String
Usage	It is used to acquire the JDBC database connection from the data source configured in WebSphere Process Server.
Globalized	Yes
Bidi supported	Yes

Poll folder (PollFolder)

This property specifies the name of the mail folder or mail folders the adapter will poll for inbound requests (e-mails).

Table 101. Poll folder details

Required	`No` for POP3 protocol `Yes` for IMAP protocol
Default	For the POP3 protocol, the default is `Inbox` For the IMAP protocol, there is no default value.
Property type	String
Usage	For the POP3 protocol, the adapter cannot poll multiple mail server folders. It will automatically default to `Inbox` because `Inbox` is the only supported value with POP3. If the **Protocol** property is set to `POP3`, this property will default to `Inbox`. No other value for POP3 is supported. If the Protocol property is set to `IMAP`, you can define one or more mail folder names. To poll multiple mail server folders, folder names are delimited with commas.
Globalized	Yes
Bidi supported	No

Port (Port)

This property specifies the POP3 or IMAP port where the mail server is listening.

Table 102. Port details

Required	No
Default	110 when the protocol is set to POP3 143 when the protocol is set to IMAP
Property type	Integer

Table 102. Port details (continued)

Usage	If the Secure connection (SSL) property is set to `True`, this property needs to be updated. For the POP3 protocol, it must be set to `995`. For the IMAP protocol, it must be set to `993`.
Globalized	No
Bidi supported	No

Protocol (Protocol)

The property specifies the protocol used for inbound communication with the mail server.

Table 103. Protocol details

Required	No
Possible values	`IMAP` `POP3`
Default	`POP3`
Property type	String
Usage	If set to `IMAP`, the adapter will use the IMAP e-mail protocol for inbound communications. If set to `POP3`, the adapter will use the POP3 e-mail protocol for inbound communications.
Globalized	No
Bidi supported	No

Retry interval if connection fails (RetryInterval)

When the adapter encounters an error related to the inbound connection, this property specifies the length of time the adapter waits before trying to establish a new connection.

Table 104. Retry interval details

Required	Yes
Default	`2000`
Unit of measure	Milliseconds
Property type	Integer
Usage	Only positive values are valid. When the adapter encounters an error related to the inbound connection, this property specifies the length of time the adapter waits before trying to establish a new connection.
Globalized	Yes
Bidi supported	No

Staging directory (InProgressFolder)

This property specifies the folder on the file system where e-mails polled from the mail server are first written in file format.

Table 105. Staging directory details

Required	Yes

Table 105. Staging directory details (continued)

Default	No default value
Property type	String
Usage	This folder must be created on the same system where the adapter is running before the adapter is started. Once written to the file system in file format, each file will be named based on the Message-ID of it's corresponding e-mail event. These details are retrieved from the Email header value.
Globalized	Yes
Bidi supported	Yes

Stop the adapter when an error is encountered while polling (StopPollingOnError)

This property specifies whether the adapter will stop polling for events when it encounters an error during polling.

Table 106. Stop the adapter when an error is encountered while polling details

Required	No
Possible values	`True` `False`
Default	`False`
Property type	Boolean
Usage	If this property is set to `True`, the adapter stops polling when it encounters an error. If this property is set to `False`, the adapter logs an exception when it encounters an error during polling and continues polling.
Globalized	No
Bidi supported	No

UseFiveLevelBO

This property specifies whether business graphs and wrappers are generated for child business objects of the Email parent business object.

Table 107. Use five level business object details

Required	No
Default	True
Property type	Boolean
Usage	This is for compatibility with earlier versions with version 6.0.2 business objects and does not appear in the external service wizard. In version 6.0.2, the default for this property was True.
Globalized	(Not available)
Bidi supported	No

User name (UserName)

This property specifies the user name for the mail server to be used for the inbound POP3 or IMAP session.

Table 108. User name details

Required	Yes
Default	No default value
Property type	String
Usage	The mail server should be running on the host noted in the host property.
Globalized	Yes
Bidi supported	Yes

User name used to connect to event data source (EP_UserName)

This property specifies the user name used by the adapter's event persistence feature.

Table 109. User name used to connect to event data source details

Required	No
Default	No default value
Property type	String
Usage	It is used to acquire the JDBC database connection from the data source specified in WebSphere Process Server.
Globalized	Yes
Bidi supported	Yes

Resource adapter properties

A resource adapter contains properties such as the adapter ID and logging and tracing options specific to the adapter. You can set the logging and tracing properties using the external service wizard during adapter configuration. You can set or change any of the properties using the administrative console.

The following table lists and describes the resource adapter properties. A more detailed description of each property is provided in property details tables 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.

Table 110. Resource adapter properties

In the wizard	In the administrative console	Description
Adapter ID	AdapterID	Identifies the adapter instance for CEI and PMI events with respect to logging and tracing.
(Not available)	Enable HA support	Do not change this property.

Adapter ID to use for logging and tracing (AdapterID)

Use this property to identify a specific deployment, or instance, of the adapter.

Table 111. Adapter ID to use for logging and tracing details

Required	Yes
Default	CWYEM_Email
Property type	String

Table 111. Adapter ID to use for logging and tracing details (continued)

Usage	This property is used to identify the adapter instance for PMI events. If you are deploying multiple instances of an adapter, set this property to a unique value for each adapter instance. For inbound processing this property is retrieved from the resource adapter properties. For outbound processing, it is retrieved form the managed connection factory properties.
Globalized	Yes
Bidi supported	No

Enable high availability support (enableHASupport)

Do not change this property. It must be set to `true`.

Globalization

WebSphere Adapter for Email 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. The adapter supports bidirectional script data transformation between integration components.

Globalization and bidirectional data transformation

The adapter is globalized to support single- and multi-byte character sets and deliver message text in the specified language. The adapter also performs bidirectional script data transformation, which 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.

Globalization

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 encodings for characters in most known character code sets (both single- and multi-byte). Therefore, when data is transferred between these integration system components, there is no need for character conversion.

WebSphere Adapter for Email converts data in mail content and attachments to a byte stream, which can in turn be converted to a string. During this process, the encoding is maintained by using Unicode encoding. For example,

- XML documents are used for integration and maintain their encoding within the document. The XML DataHandler is globalized so the data remains intact.
- The adapter converts a stream of data to bytes, which in turn is converted to a string. During this process the encoding is maintained by using UTF-8 encoding.

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 all the group 1 languages and Thai.

Bidirectional script data transformation

Languages such as Arabic and Hebrew are written from right to left, yet they contain embedded segments of text that are written left to right, resulting in bidirectional script. When software applications handle bidirectional script data, standards are used to display and process it. Bidirectional script data transformation applies only to string type data. WebSphere Process Server and WebSphere Enterprise Service Bus use the Windows standard format, but applications or file systems that exchange data with the server might use a different format. The adapter transforms bidirectional script data passed between the two systems so that it is accurately processed and displayed on both sides of a transaction. It transforms the script data by using a set of properties that defines the format of script data, as well as properties that identify content or metadata to which transformation applies.

Note: Popular wrapper business object header values such as from, to, Cc, Bcc, reply-to, subject, and date are bidi-enabled. The name portion of e-mail addresses are also bidi-enabled.

Bidirectional script data formats

WebSphere Process Server and WebSphere Enterprise Service Bus use the bidirectional format of ILYNN (implicit, left-to-right, on, off, nominal). These five attributes comprise the format used by Windows. If an application or file system that sends or receives data from the server uses a different format, the adapter converts the format prior to introducing the data to the server. For the conversion to occur, you use the external service wizard to set attribute values that represent the bidirectional format used by the sending application or file system. This is done when you deploy the module for the first time.

The bidi format consists of five attributes that must be set correctly. Bidirectional data format attributes and values are listed in the following table.

Table 112. Bidirectional data format attributes and values

Letter position	Purpose	Values	Description	Default setting
1	Order schema	I V	Implicit (Logical) Visual	I
2	Direction	L R C D	Left-to-Right, Right-to-Left Contextual Left-to-Right Contextual Right-to-Left	L
3	Symmetric Swapping	Y N	Symmetric Swapping on Symmetric Swapping off	Y
4	Shaping	S N I M F B	Shaped text Unshaped text Initial shaping Middle shaping Final shaping Isolated shaping	N
5	Numeric Shaping	H C N	Hindi Contextual Nominal	N

Bidirectional properties that identify data for transformation

To identify business data that is subject to transformation, set the bidi format string property. Do this by specifying values for each of the five bidirectional format attributes (listed in Table 112 on page 168) for the property.

To identify event persistence data subject to transformation, set the BiDiFormatEP property. Do this by specifying values for each of the five bidirectional format attributes (listed in Table 1) for the property. The BiDiFormatEP property can be set for the activation specification.

To identify application-specific data for transformation, annotate the BiDiContextEIS property and the BiDiMetadata property within a business object. Do this by using the business object editor within WebSphere Integration Developer to add the properties as application-specific elements of the business object.

Properties enabled for bidirectional data transformation

Bidirectional data transformation properties control the format of bidirectional script data exchanged between an application or file system and integration tools and runtime environments. Once these properties are set, bidirectional script data is correctly processed and displayed in WebSphere Integration Developer and WebSphere Process Server or WebSphere Enterprise Service Bus.

Bidi-enabled managed connection factory properties

At design time all bidi-enabled properties can be configured using external service wizard in WebSphere Integration Developer and all business object bidi properties can be configured using the Business Object Editor tool in WebSphere Integration Developer. At deployment time, all managed connection factory (outbound) and activation specification (inbound) bidi properties can be configured using WebSphere Process Server administrative console.

Bidirectional (bidi) properties are divided into three types.

- EIS bidi format. Indicates the bidi format for string type business data exchanged between the mail server and the adapter.
- Metadata bidi format. Indicates the bidi format for metadata and configuration data of type string used by the adapter to establish and maintain communication with the mail server. This includes both configuration properties such as user name and application-specific information stored in business object definitions (XSD files) and business object attributes.
- Event persistence bidi format. Indicates the bidi format for event persistence properties.

The following table shows property types characterized by bidi format.

Table 113. Bidi formats

Level of property definition	**Bidi-enabled property name**	**Property name as it appears in the wizard**	**Property name as it appears in the administrative console**
Managed connection factory properties	MCF related properties	BiDi format string	BiDiContextEIS
Activation specification properties	AS related properties	EIS BiDi Format	BiDiContextEIS
Activation specification properties	All event persistence properties	Event Persistence BiDi Format	BiDiFormatEP

Table 113. Bidi formats (continued)

Level of property definition	Bidi-enabled property name	Property name as it appears in the wizard	Property name as it appears in the administrative console
Business object	BO related properties	EIS BiDi Format	BiDiContextEIS
Business object	BO related properties	Metadata BiDi Format	BiDiContextMetadata

All the bidi-supported configuration properties for both inbound and outbound communication are shown in the following tables. Only properties of type string are bidi-enabled. Integer properties, such as port and host, the host name property, and Boolean type properties cannot be bidi-enabled.

The following managed connection properties can be set to control bidirectional transformation during outbound communications.

Table 114. Bidi-enabled managed connection factory properties

In the wizard	In the administrative console
User name	UserName
Password	Password

Note: The protocol managed connection factory property is not bidi-enabled because it maintains a constant value of `SMTP`.

Bidi-enabled activation specification properties

The following activation specification properties can be set to control bidirectional transformation during inbound communications.

Table 115. Bidi-enabled activation specification properties

In the wizard	In the administrative console
Archive file naming pattern	ArchiveFileNamingPattern
Archive folder	ArchiveFolder
Database	EP_Password
Database schema name	EP_SchemaName
User name used to connect to event data source	EP_UserName
Event recovery data source (JNDI) name	EP_DataSourceJNDIName
Event recovery table name	EP_TableName
Failed events folder	FailedEventsFolder
Password	Password
Poll folder	PollFolder
Staging directory	InProgressFolder
User name	UserName

Note: Substring searches for globalized characters are not supported by the Java Mail API, so MatchAllCriteria and MatchSomeCriteria are not bidi-enabled.

Adapter messages

View the messages issued by WebSphere Adapter for Email at the following location.

Link to messages: http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r1mx/topic/com.ibm.wbit.610.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 CWYEM are issued by WebSphere Adapter for Email
- 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 the WebSphere Adapter for Email.

Samples and tutorials

The WebSphere Integration Developer online samples/tutorials gallery includes samples and tutorials to help you use WebSphere Adapters. You can access the online samples/tutorials gallery as follows:

- From the welcome page that opens when you start WebSphere Integration Developer. To see samples and tutorials for WebSphere Adapter for Email, 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 6.1.0, information center, which includes WebSphere Process Server, WebSphere Enterprise Service Bus, and WebSphere Integration Developer information: http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r1mx/index.jsp
- WebSphere Adapters, version 6.0.2, information center: http://publib.boulder.ibm.com/infocenter/dmndhelp/v6rxmx/topic/com.ibm.wsadapters602.doc/welcome_top_wsa602.html
- 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, developerWorks, Redbooks, Tivoli, ViaVoice, and WebSphere are registered trademarks of International Business Machines Corporation in the United States, other countries, or both.

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

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

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).

Index

F

G

H

I

J

K

L

M

N

O

P

R

S

T

W

X

Printed in USA