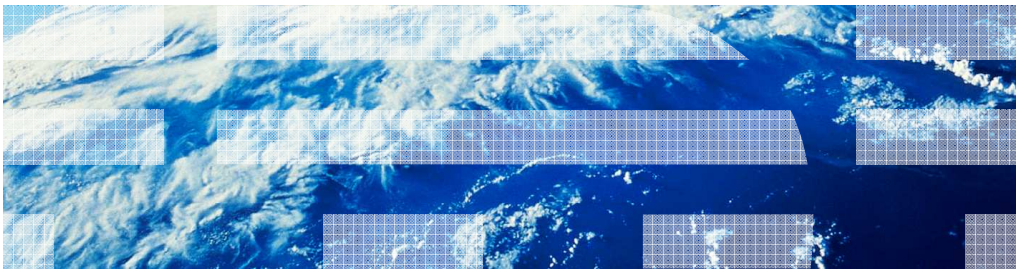
WebSphere® Business Process Management Suite V7.0

WebSphere Adapters for E-mail V7.0



This presentation covers the IBM WebSphere Adapter for E-mail V7.0

Agenda

- Overview
- Business object structure
- Inbound processing
- Outbound processing
- Summary and references

This presentation starts with the introduction of WebSphere adapter for E-mail V7.0 including new features and enhancements. It then provides in detail about different types of business objects for both inbound and outbound processing.

Section

Overview

This section provides an overview of the WebSphere Adapter for E-mail V7.0

Overview

- IBM WebSphere Adapter for E-mail implements the Java™ Enterprise Edition Connector Architecture (JCA), version 1.5 specification
- Enables bi-directional connectivity for integration with Enterprise Information System applications that can communicate through e-mails
- Sending and receiving mails to/from different mail servers using e-mail protocols
  - Outbound (SMTP)
  - Inbound (IMAP, POP3)

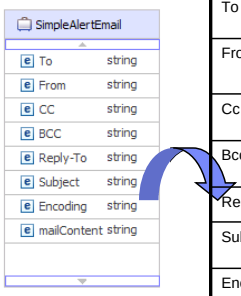
The IBM WebSphere Adapter for E-mail implements the JCA 1.5 specification, enabling bi-directional connectivity, both inbound and outbound, with those Enterprise Information System business applications that can communicate only through e-mails. The e-mail resource adapter supports integration through sending and receiving mail to and from different mail servers using several e-mail protocols, including SMTP, IMAP and POP3.

Section

Business object structure

This section provides an overview of the business object structure.

Business object: E-mail simple data binding



Attribute Name	Required	Description
To	No	The To addresses of the e-mail. This field contains the identity of the primary recipients of the e-mail.
From	Yes	The From address of the e-mail. This field contains the identity of the person who want this message to be sent.
Cc	No	The cc addresses of the e-mail. This field contains the identity of the secondary (informational) recipients of the message
Bcc	No	The bcc addresses of the e-mail. This field contains the identity of additional recipients of the message.
Reply-To	No	The value set in the ReplyTo field, relates to whom the reply should be sent.
Subject	No	This is intended to provide a summary, or indicate the nature, of the message .
Encoding	No	As there is no annotation, Encoding is same for all headers, mailContent and attachments.
mailContent	No	Simple alert string message. No other mail content allowed, contentType is set as “text/plain”

- Pass through scenario
  - Simple alert e-mail data type
  - Support outbound only

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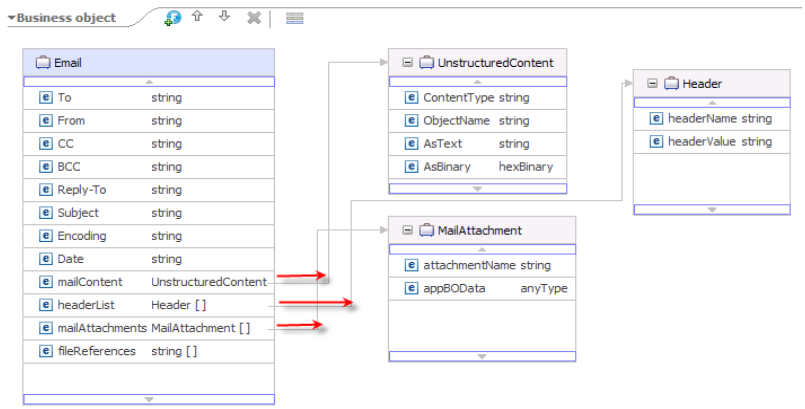
The first business object structures in E-mail adapter is called simple alert e-mail. You send a simple alert e-mail SDO for sending a single string e-mail message in the body. FROM and TO are mandatory fields. The intended recipient is a human, therefore, there is no expectation that the sent e-mail message content is formatted . The body mime type is “text/plain”.

Both e-mail simple data binding and e-mail wrapper data bindings can process simple alert e-mail business objects for data transformations. However, e-mail simple data binding is preferred, since the business object does not require any database properties to be configured. The data binding receives the simple alert e-mail business object and returns the EmailStructuredRecord. It then populates these fields from the simple alert e-mail business object into the EmailStructuredRecord’s streams. This particular business object is used only for Outbound processing.

Business object: E-mail wrapper data binding



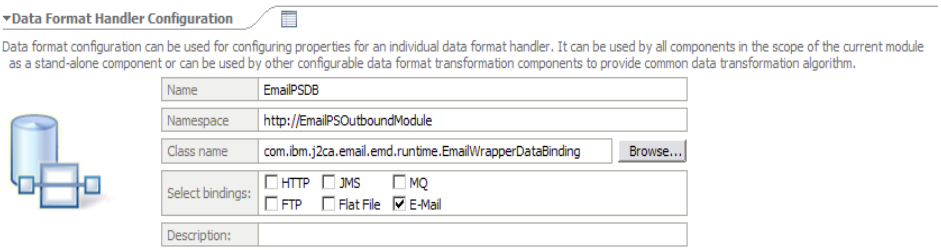
- Pass through scenario
  - Without data transformation
  - Generic e-mail and generic e-mail with business graph data types
  - Email data binding is used exclusively in previous version

Email wrapper data binding replaces e-mail data binding as the default data binding. However, this data binding is used exclusively for compatibility with business objects created in previous version. This data binding supports the five-level business object structure used in previous version.

During inbound processing, MimeType is used as the key to fetch the data handler to call; BOType is not used. In a pass through scenario, for the mime types that do not have any specified association with the mime-specific data binding, the mail content is not parsed. The content is copied into an UnstructuredContentBO and set to the mailContent attribute of E-mail business object. Similarly for attachments, a mailAttachment business object is instantiated by the e-mail wrapper data binding and the content is copied in to the UnstructuredContentBO and it is filled into the appBOData attribute in MailAttachment business object.

During Outbound processing, BOType is used as the key and the mime type is set on the data handler. In addition, e-mail wrapper data binding also supports the simple alert e-mail business object as mentioned in previous slide.

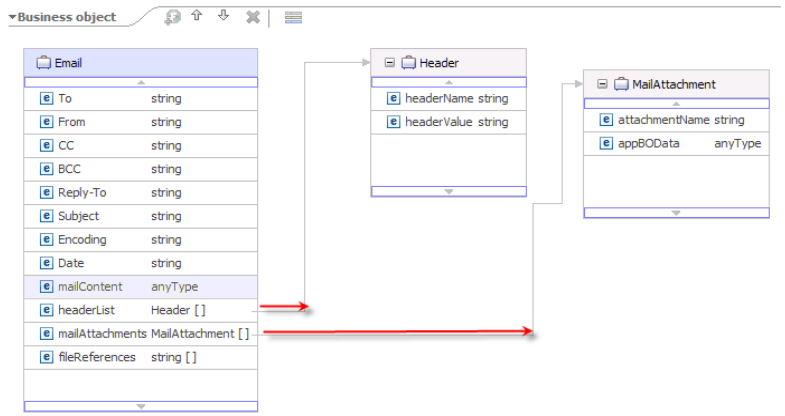
Business object: E-mail wrapper data binding



- Pass through scenario
  - Binding configuration for E-mail wrapper data binding

Here is an example of binding configuration for e-mail wrapper data binding. It creates and configures the data binding operations, which generate the business objects and other artifacts for the pass-through scenario. So the UnstructuredContent business object is used to transfer pass-through data. The data inside (either in AsText or AsBinary) is not transformed by data binding.

Business object: E-mail wrapper data binding

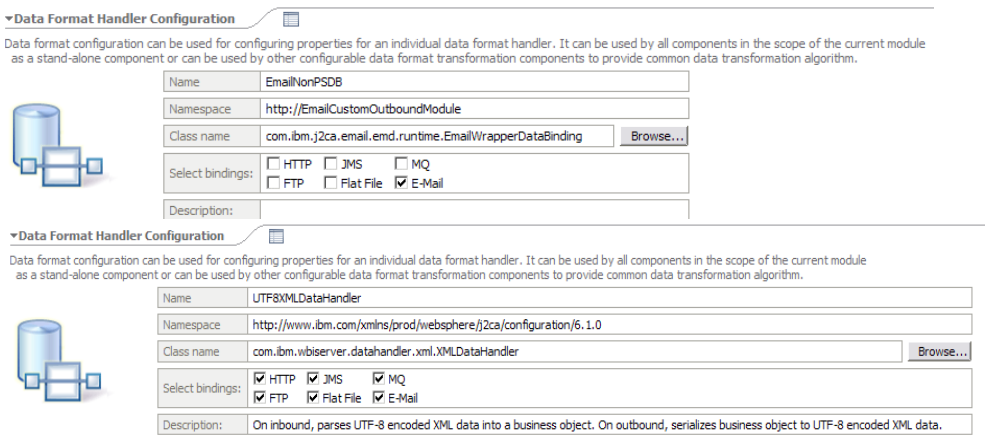


- Non pass through scenario
  - With data transformation
  - Generic e-mail and generic e-mail with business graph data types
  - Email data binding is used exclusively in previous version

Another scenario for e-mail wrapper data binding is non pass through scenario. Similarly, during inbound, MimeType is used as key to fetch the datahandler to call and BOType is not used. During outbound, BOType is used as key and MimeType is set on data handler. However, the difference in this non pass through scenario is that the data inside is now transformed by the data binding.

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

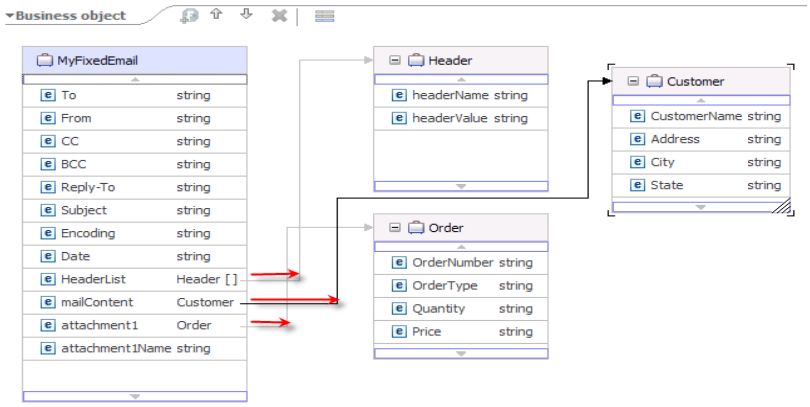
Business object: E-mail wrapper data binding



- Non pass through scenario
  - Binding configuration for E-mail wrapper data binding in case of non pass through scenario

Here is another example of a binding configuration for e-mail wrapper data binding. This is a non pass through scenario that includes creating and configuring the data binding, data handler and operation, which generate the business objects and other artifacts.

Business object: E-mail fixed structure data binding



- User-defined e-mail business object wrapper (any wrapper name)
  - Supporting specific business object structures
  - User defined data type
  - Order of attachment is significant

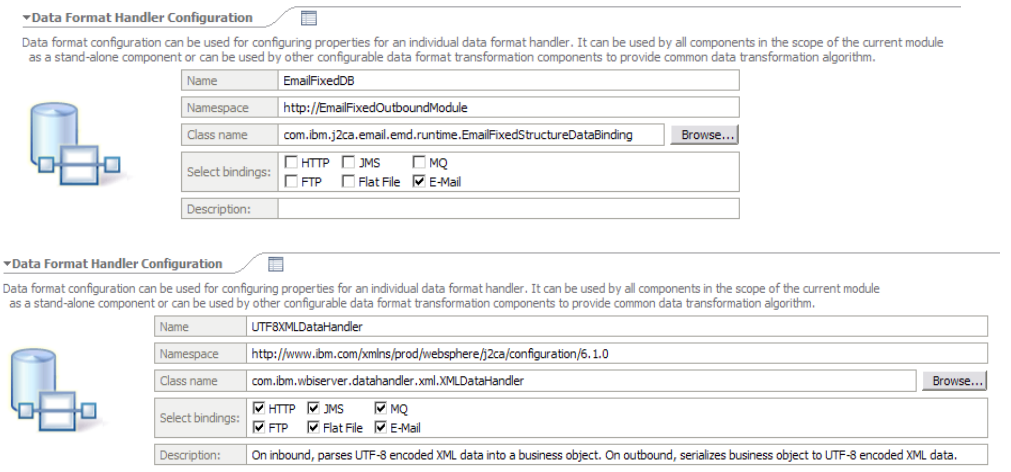
This data binding is used when handling defined business object structures. The e-mail parts, such as mailContent and attachment1, are set by user during the external service wizard. For example, mailContent is set to customer, attachment1 is order, attachment2 is account and so on. With this data binding, the order of the attachments is significant. The attachments must be in the same order as the attributes in the business object.

During inbound, e-mail fixed structure data binding is used only for the operation Emit, and this data binding can only use the e-mail fixed structure type of business object. The user defines and names the e-mail fixed structure wrapper business object during the external service wizard step.

During outbound, e-mail fixed structure data binding is used only for the operation Create. The default attachment name will also be used during outbound. The default attachment name is used whenever the Request business object does not have an attachment name defined. If the attachment name is null in both places, an attachment name is not set.

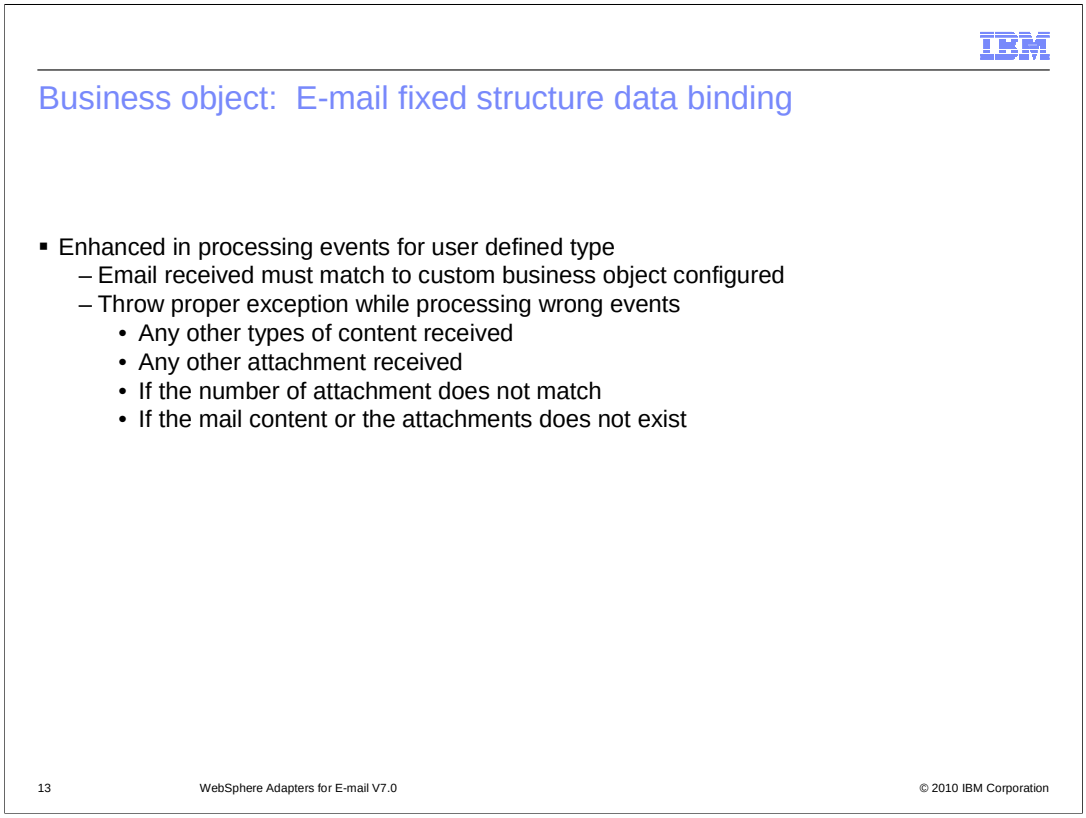
In the case when a fixed structure business object is created or selected before the data binding is created, this will pre-populate the data binding properties including the values for the business object's e-mail part and BOType. The user will have to fill in the corresponding data handler configuration and MimeType values. In this scenario, user allows to edit the existing e-mail parts, but does not allow to add any new ones. User should also be careful of the order of these parts, since the incoming e-mail message needs to exactly match the e-mail parts defined for the business object type, in the data binding properties.

Business object: E-mail fixed structure data binding



- Always non pass through

Here is an example of an e-mail fixed structure data binding, which is only applicable in a non pass through scenario. It creates and configures the data binding, data handler and operation, which correspond to the business objects and other artifacts in the fixed structure.



When the adapter is configured for user defined type e-mail, the e-mail received must match to the custom business object configured with the e-mail fixed structure data binding. During external service wizard, while configuring the e-mail fixed structure data binding, a user creates a custom data type with the required mail content and the attachment business objects. If the received mail does not match to the custom data type specified, for example, the business object type of the mailContent or the attachment or the number of attachments, the adapter provides exception with the appropriate error message.

One sample scenario is when the e-mail fixed structure data binding is configured to use a custom business object as input such as mailContent as 'Customer' and attachment as 'Address'. In this case, the received mail should have exact mail content as 'Customer' and one attachment as 'Address'. Some of the scenarios where events are considered as wrong are when there is another type of content or attachment received, the number of attachments does not match, or the mail content or attachment does not exist.

Section

Inbound

This section provides an overview of Inbound processing.

Inbound: Emitting individual business objects

- Emit individual business objects from a multi-part e-mail
  - Activation Specification property, “EmitIndividualBOs”
  - Converts into a message and the corresponding RFC822 format file is written to InProgress folder.
    - MessageID+”_WebSphere_EmailRA_Bodypart_001” , MessageID+”_WebSphere_EmailRA_Bodypart_002”.
- Process embedded image file content as binary type

During inbound, this property specifies whether the adapter will create individual business objects for each part of a multipart e-mail. It uses a Boolean value to determine whether to emit the whole e-mail as a single e-mail business object or emit each individual part in the multipart e-mail as individual business objects. If it is set to true, then each part is converted into a message and the corresponding RFC822 format file is written to the InProgress folder with file names as shown here.

When adapter is configured for emitIndividualBOs , it has to return e-mail business object for each email part from the e-mail polled. For example, if an e-mail polled has mailContent and two attachments then adapter has to treat each e-mail part as individual event. So, in this case adapter has to create three events in the table and then has to return three e-mail business objects for each event. The e-mail business object returned will have corresponding content specific business object at mailContent attribute of the e-mail business object. In case pass through scenario, the mailContent attribute will have UnstructuredContent business object with either AsText or AsBinary having actual content. In case of non pass through scenario, the mailContent attribute of e-mail business object will have content specific business object.

Starting with this release, the E-mail adapter processes all binary type including image file contents when emit Individual property is set to true. For example, when an e-mail polled has mailContent including a text along with image embedded and an attachment, the adapter has to create three events in the archive folder. Then it has to return three e-mail business objects for each event. In this case, the adapter considers text binary as first event, embedded image binary as second event, and attachment as third event.

Inbound support : Event table

Event Persistence table Column	Description
EVNTID	Message ID for the e-mail
EVNTSTAT	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	Assure event delivery and recovery
EVNTDATA	Stores the name of the folder on the mail server where the e-mail event was polled

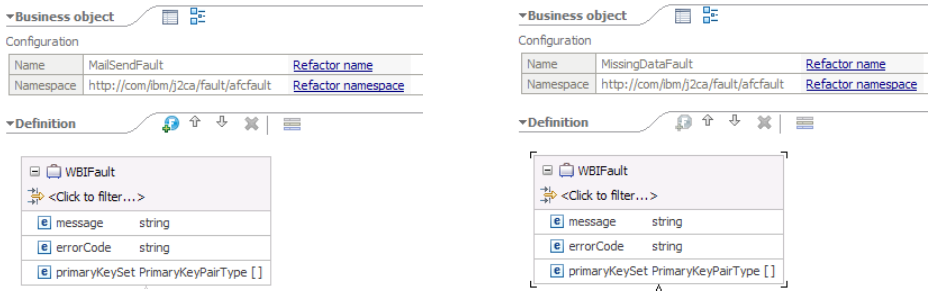
- The adapter can track and recover events
  - Uses in case of abrupt termination
  - Uses the data source for persisting the event state in an event recovery table

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 or WebSphere Enterprise Service Bus. If the adapter is abruptly terminated, the adapter uses the event store to determine which events have and have not been processed.

This table shows the components involved in the end-to-end handling of events. The Event ID contains the Message ID of the e-mail. The valid values for the Event Status field are NEW and INPROGRESS. An e-mail that is on the mail server and matches the selected search criteria is marked as NEW. The same e-mail, when copied from the mail server to the local folder, is marked as INPROGRESS. The event is deleted once it is processed, whether successfully or not.

This section provides an overview of Outbound processing.

Outbound – business fault

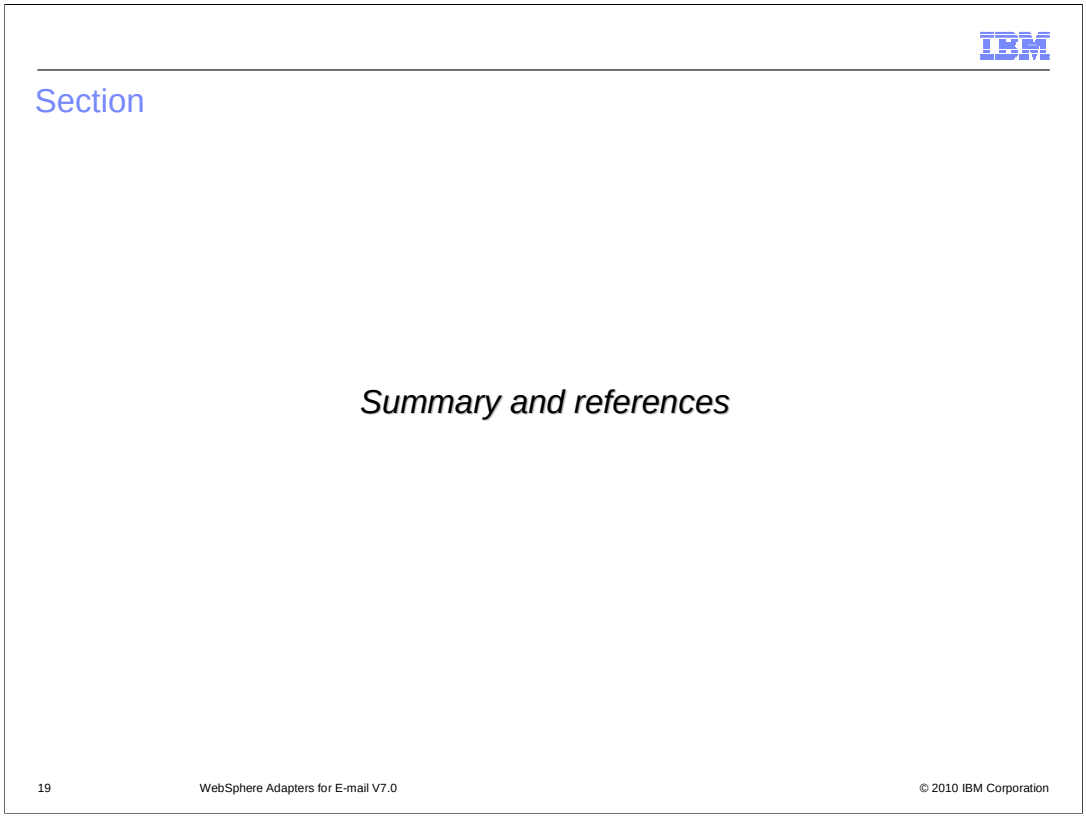


- Support for automated fault enablement
  - Previously
    - Business object is thrown for an exception condition
    - Request-response style operation
    - Manual generated artifact modification
  - In V7.0 and later
    - Generate fault bindings
    - Manual modification is no longer required
    - Generate individual response business object for each fault
      - EmailSendFault
      - MissingDataFault

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, and are caused by 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. Faults are generated for errors that are actionable, that is, errors that can have a recovery action the ones 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.

From the figure, 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, error code, and primaryKeySet attributes.

The WebSphere Adapter for E-mail enables faults for you. Manual configuration of faults is not required. The adapter provides EmailSendFault and MissingDataFault that external service wizard creates.



This section provides a summary of the WebSphere Adapter for E-mail V7.0, and some useful reference information.

Summary

- WebSphere Adapter for E-mail enables integration with SCA Applications and Enterprise Information System applications that can communicate only through e-mail.
  - Inbound and outbound support
- Looked at business object structures
- Looked at inbound and outbound data bindings

In summary, this presentation covered many of the details of the WebSphere Adapter for E-mail V7.0. The WebSphere Adapter for E-mail enables integration with SCA business integration applications and Enterprise Information System applications through e-mail. The Adapter supports integration through sending and receiving e-mails to and from different mail servers, and inbound and outbound interactions. This presentation showed you the different business object structures, and the multiple data bindings for the e-mail adapter.

Reference information

- WebSphere Adapter for E-mail User Guide
- Java Connector Architecture
  - http://java.sun.com/j2ee/connector/index.jsp
- WebSphere Adapter Information Center
  - http://www-306.ibm.com/software/integration/wbiadapters/library/infocenter/
- WebSphere Process Integration information center
  - http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/index.jsp?topic=/com.ibm.websphere.wps.doc/welcome_wps.html

The WebSphere Adapter for E-mail User Guide is an excellent source for more detailed information, and these URL's link to some additional reference information on related topics.

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