

How-to Guide
SAP NetWeaver '04



How To... Correlate JMS Messages

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1 Introduction

The Java Message Service (JMS) supports asynchronous communication only. However, a request/response model similar to synchronous communication can be implemented using a reply queue mechanism and *JMS Correlation ID/JMS Message ID*.

According to the JMS specification, the usage of the *JMS Correlation ID* is not mandatory. In the following scenarios the *JMS Correlation ID* is used. Therefore, as a prerequisite the JMS Provider has to support it.

This guide shows how to map asynchronous JMS messages to synchronous communication. In general, two scenarios are considered:

- Sync/async
- Async/sync

The purely asynchronous case is not addressed here. For SAP XI3.0 SP18 and below, Business Process Management (BPM) as part of SAP Exchange Infrastructure (SAP XI) 3.0 has to be used, see chapters **Error! Reference source not found.** and **Error! Reference source not found.** For SAP XI3.0 SP19 and above, the JMS adapter provides modules that support async/sync and sync/async communication, see chapters 2.3 and 2.4. In this case, BPM is not necessary.

In SAP XI 3.0 SP12 and higher, some JMS header data can be assigned to XI header data, and the other way around.

- In the JMS sender adapter, the *XI Message ID* can be defined as *GUID*, *JMS Message ID*, *JMS Correlation ID*, or *JMS Property*. The resulting ID must comply with ISO-11578. Furthermore, the JMS Provider has to ensure that the ID is unique, otherwise message processing will fail. The *XI Conversation ID* can be defined as *JMS Message ID*, *JMS Correlation ID*, *JMS Property*, or kept undefined (*no value*).
- In the JMS receiver adapter, the *JMS Correlation ID* can be defined as *XI Message ID*, *XI Reference ID (RefToMessageID)*, *XI Conversation ID*, or kept undefined.

In SAP XI 3.0 SP15 and higher, the send step within BPM has been enhanced. While sending a message, it is possible to set the *Conversation ID* using XI header fields, payload data, or constants.

The sync/async bridge step within BPM is available in SAP XI 3.0 SP4 and higher. You can correlate the asynchronous JMS request and response messages by referencing either the payload data or the header fields. The former is available in SAP XI 3.0 SP0 and higher (in conjunction with the sync/async bridge in SAP XI 3.0 SP4 and higher). The latter uses the enhanced send step, as mentioned above, so it is supported in SAP XI 3.0 SP15 and higher only.

For the async/sync case, the JMS response message is correlated to the JMS request message using header-based correlation, that is, using the *JMS Correlation ID*. In the Communication Channel, it is only possible to assign XI header fields to the *JMS Correlation ID*, but no payload data (see below). However, if you want to put payload data into the *JMS Correlation ID*, you can do so by using the *XI Conversation ID*. There are two general mechanisms to configure the correlation within SAP XI, either using the *XI Message ID* or using the *XI Conversation ID*. The former is supported in SAP XI 3.0 SP12 and higher, but it is subject to restrictions with respect to the *XI Message ID*, as

mentioned above. The latter is supported in SAP XI 3.0 SP15 and higher. See also SAP Note 838894.

2 Scenarios

2.1 BPM Sync/Async Bridge

A synchronous request message is mapped to an asynchronous JMS request message by means of the sync/async bridge functionality of BPM. The synchronous call waits until the JMS provider sends a reply that is mapped to the corresponding synchronous response.

The JMS response message must be correlated to the JMS request message in order to assign both messages to the same BPM process instance. As stated above, the correlation can be established using either payload data or header fields. In general, the header-based approach uses the *XI Message ID* to create a unique correlation. Since the Business Process Engine (BPE) works with different message instances, the *XI Message ID* of the outbound message does not correspond to the *XI Message ID* that defines the correlation. Therefore, the approach does not work with the *XI Message ID* only, it requires the *XI Conversation ID* to be set within BPM.

Regarding the correlation on the JMS side, two possibilities are considered, either referencing the *XI Message ID* or the *JMS Message ID* of the request message.



In SAP XI 3.0 SP16 and higher, the configuration of how to map the *JMS Message ID* to the *XI Conversation ID* has been changed. There is no need to use additional parameters, instead standard parameters are provided in the communication channels. However, the configuration settings made prior to SP16 will still be supported. For further details, refer to SAP Note 838894.

For the payload-based correlation, the following settings have to be made (see chapter 3.4):

- Define appropriate correlations in a BPM integration process.

For the header-based correlation with JMS response message referencing the *XI Message ID* of the request, the following settings have to be made (see chapter 3.1):

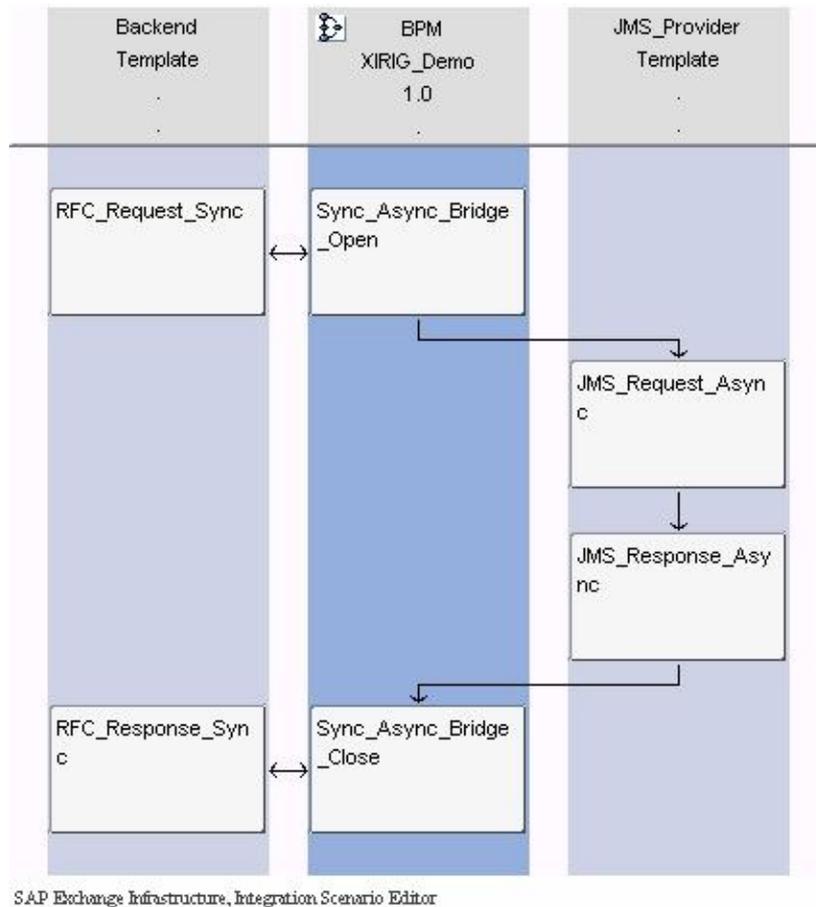
- Define a correlation for the response's message interface using the *XI Conversation ID* as the correlation key.
- BPM integration process, send step (send JMS request):
Activate the correlation using *XI Message ID* and set *XI Conversation ID* to *XI Message ID*.
- BPM integration process, receive step (receive JMS response):
Use the correlation that you activated in the send step.
- JMS receiver communication channel (to send JMS request to JMS Provider):
Set *JMS Correlation ID* to the *XI Conversation ID*.
- JMS sender communication channel (to send JMS response to SAP XI):
Set *XI Message ID* to *GUID*, and *XI Conversation ID* to *JMS Correlation ID*.

For the header-based correlation with JMS response message referencing the *JMS Message ID* of the request, the following settings have to be made if using XI 3.0 SP15 and below (see chapter 3.2):

- Define a correlation for the message interface of the response using *XI Conversation ID* as correlation key.
- BPM integration process, send step (send JMS request):
Activate the correlation using *XI Message ID*, and set *XI Conversation ID* to *XI Message ID*.
- BPM integration process, receive step (receive JMS response):
Use the correlation that you activated in the send step.
- JMS receiver communication channel, correlation settings:
Set *JMS Correlation ID* to *XI Conversation ID*.
- JMS receiver communication channel, additional JMS parameters:
Maintain additional JMS parameter with *Name* `XIMapConversationID` and *Value* `true` to store a mapping between the request's *JMS Message ID* and *XI Conversation ID*.
- JMS sender communication channel, correlation settings:
Set *XI Message ID* to *GUID*, and *XI Conversation ID* to *JMS Correlation ID*.
- JMS sender communication channel, additional JMS parameters:
Maintain additional JMS parameter with *Name* `XIConversationID`, and *Value* `XI_COR_XIJMSMAP` to map the response's *JMS Correlation ID* (referencing the request's *JMS Message ID*) to the original *XI Conversation ID*.

For the header-based correlation with JMS response message referencing the *JMS Message ID* of the request, the following settings have to be made if using XI 3.0 SP16 and above (see chapter 3.3):

- Define a correlation for the message interface of the response using *XI Conversation ID* as correlation key.
- BPM integration process, send step (send JMS request):
Activate the correlation using *XI Message ID*, and set *XI Conversation ID* to *XI Message ID*.
- BPM integration process, receive step (receive JMS response):
Use the correlation that you activated in the send step.
- JMS receiver communication channel, correlation settings:
Set *JMS Correlation ID* to *XI Conversation ID*, and tick the *Store JMSCorrelationId of request* indicator in order to save the *JMS Correlation ID* of the request.
- JMS sender communication channel, correlation settings:
Set *XI Message ID* to *GUID*, and *XI Conversation ID* to *Stored JMSCorrelationId of request*.



2.2 BPM Async/Sync Bridge

An asynchronous JMS request message is mapped to a synchronous request message. Within the BPM integration process, a synchronous call is executed. The return of the synchronous call is mapped to an asynchronous JMS response message.

Here, no correlation within the BPM integration process is required. Correlation is established by means of the *JMS Correlation ID* header field of the JMS response message that references the JMS request message.

As mentioned above, there are two general approaches for configuring the correlation within SAP XI, either using the *XI Message ID* or using the *XI Conversation ID*.

For the header-based configuration via *XI Message ID*, the following settings have to be made (see chapter 3.7):

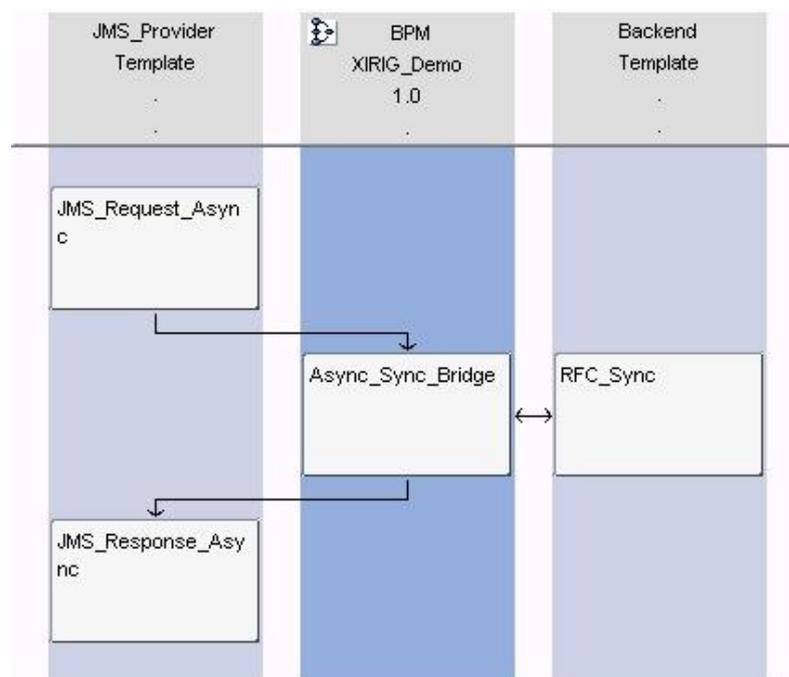
- JMS sender communication channel (to send JMS request to SAP XI):
Set the *XI Message ID* to *JMS Message ID* (or optionally to *JMS Correlation ID*).
- BPM integration process:
Set the *receiver from* mode of asynchronous send step (to send JMS response) to *Response to Message*, and reference the request message.
- JMS receiver communication channel (to send JMS response to JMS Provider):
Set *JMS Correlation ID* to *XI Reference ID*.

For the header-based configuration using the *XI Conversation ID*, the following settings have to be made (see chapter 3.5):

- JMS sender communication channel (to send JMS request to SAP XI):
Set the *XI Message ID* to *GUID* and *XI Conversation ID* to *JMS Message ID* (or optionally to *JMS Correlation ID*).
- BPM integration process:
Set the *XI Conversation ID* of send step (to send JMS response) to the *XI Conversation ID* of request message.
- JMS receiver communication channel (to send JMS response to JMS provider):
Set *JMS Correlation ID* to *XI Conversation ID*.

To assign payload data of the request message to the *JMS Correlation ID*, the following settings have to be made (see chapter 3.6):

- In BPM integration process:
Set the *XI Conversation ID* of send step (to send JMS response) to equal the appropriate payload field of request message.
- JMS receiver communication channel (to send JMS response to JMS Provider):
Set *JMS Correlation ID* to *XI Conversation ID*.



SAP Exchange Infrastructure, Integration Scenario Editor

In the case of the purely asynchronous case, a JMS request message is sent asynchronously to a receiver by using SAP XI. The reply has to be correlated to the JMS request. The implementation is similar to the async/sync case above. Even in this case, BPM is mandatory for the same reason as stated above: currently, it is not possible to assign payload data to the *JMS Correlation ID* within a communication channel.

2.3 Sync/Async Bridge in the Receiver JMS Adapter

A synchronous call is mapped to asynchronous JMS request/response messages by means of the module processor in the JMS adapter. In the module processor of the JMS receiver adapter, the synchronous message is converted to an asynchronous request message and sent to a JMS queue. The synchronous call waits until the JMS provider sends a reply. In the module processor of the JMS sender adapter, the asynchronous response message is passed to the module processor of the receiver adapter, and sent as synchronous response of the waiting synchronous request.

The following settings have to be made (only supported as of SAP XI3.0 SP19 and above, see chapter 3.8):

- JMS receiver communication channel, correlation settings:
Set *JMS Correlation ID* to *XI Message ID*, and tick the *Store JMSCorrelationId of request* indicator in order to save the *JMS Correlation ID* of the request.
- JMS receiver communication channel, module settings:
Add module *RequestOnewayBean* to convert the synchronous request message to an asynchronous request message. Add module *WaitResponseBean* to wait for response message.
- JMS sender communication channel, correlation settings:
Set *XI Message ID* to *GUID*, and *XI Conversation ID* to *Stored JMSCorrelationId of request*.
- JMS sender communication channel, module settings:
Add module *NotifyResponseBean* to pass response message to the module processor of the receiver adapter.

2.4 Async/Sync Bridge in the Sender JMS Adapter

Asynchronous JMS request/response messages are mapped to a synchronous call by means of the module processor in the JMS adapter. In the module processor of the sender JMS adapter, the asynchronous request message is converted to a synchronous request message. The synchronous response message is converted to an asynchronous response message, and sent to the receiver JMS adapter.

The following settings have to be made (only supported as of SAP XI3.0 SP19 and above, see chapter 3.9):

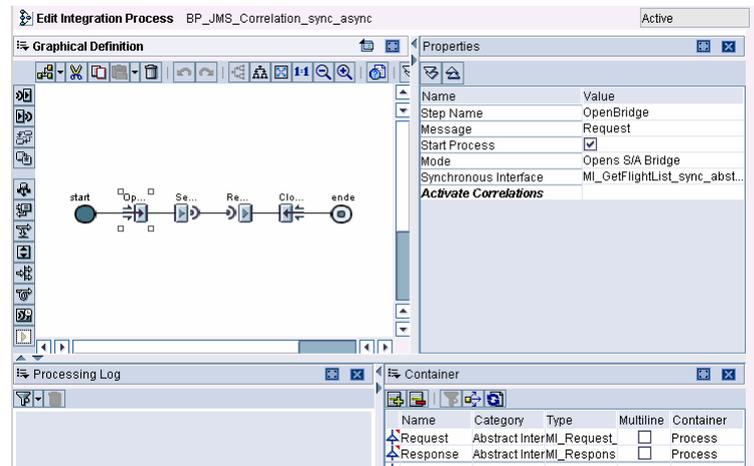
- JMS sender communication channel, correlation settings:
Set *XI Message ID* to *GUID*, and *XI Conversation ID* to *JMS Message ID*.
- JMS sender communication channel, module settings:
Add module *RequestResponseBean* to convert the asynchronous request message to a synchronous request message. Add module *ResponseOnewayBean* to convert the synchronous response message to an asynchronous response message, and to send response to the receiver adapter.
- JMS receiver communication channel, correlation settings:
Set *JMS Correlation ID* to *XI Conversation ID*.

3 The Step-By-Step Solution

3.1 BPM Header-Based Sync/Async Bridge – JMS Response Referencing XI Message ID of Request

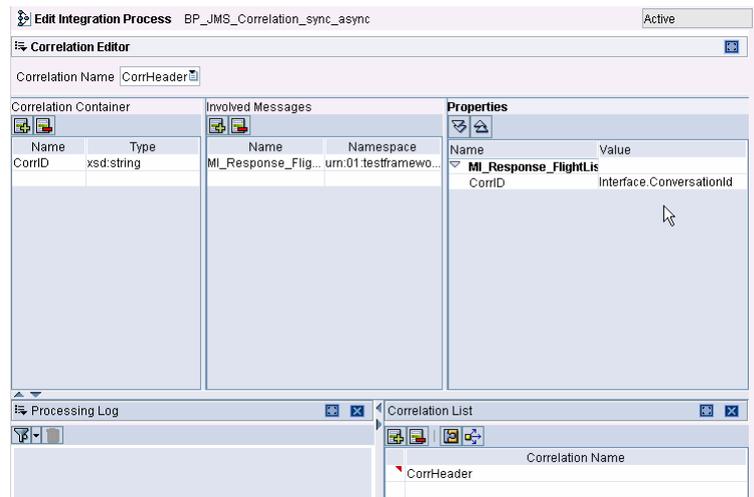
1. Start the Integration Process Editor in the *Integration Builder (Design)*.

Create a receive step of mode *Opens S/A Bridge* to open the bridge.



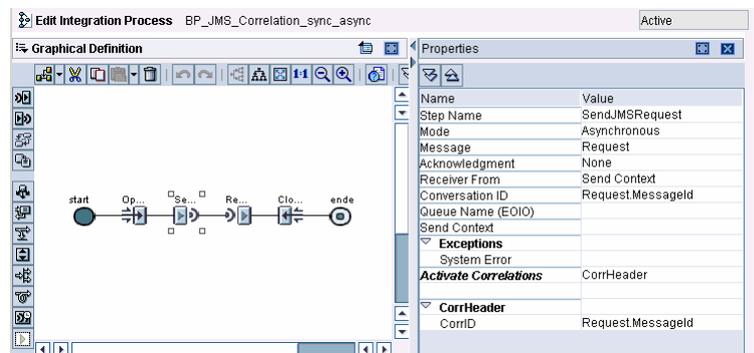
2. Create a Correlation.

Assign the *XI Conversation ID* of the JMS response message to this correlation.



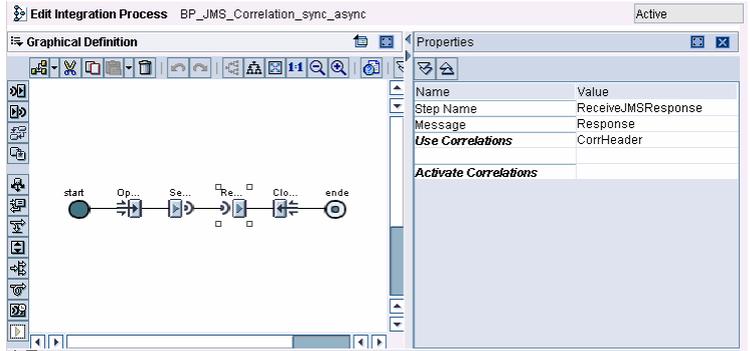
3. Create an asynchronous send step to send the JMS request message.

Assign the *XI Message ID* of the JMS request to both the Conversation ID and the correlation.

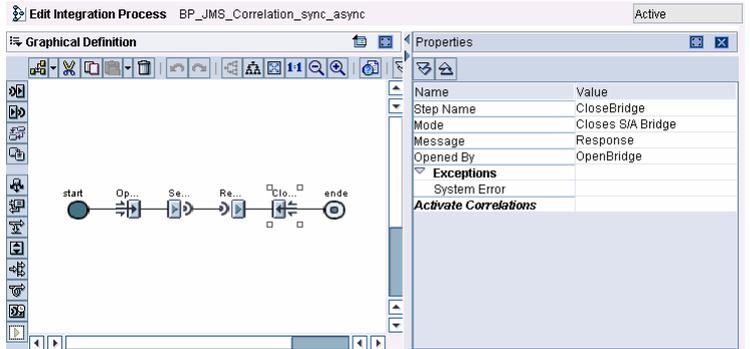


4. Create a receive step to fetch the JMS response message.

Use the correlation created beforehand. It is filled by the *XI Conversation ID* of the JMS response message.

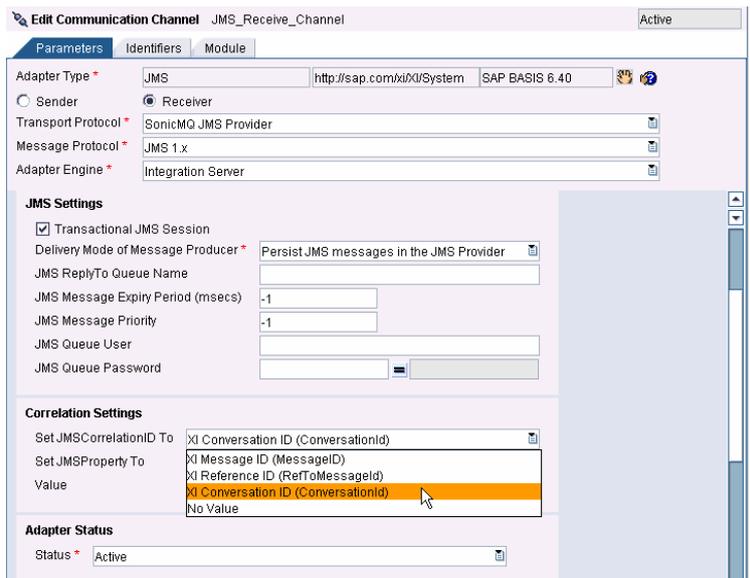


5. Create a send step of mode *Closes S/A Bridge* to close the bridge, and refer to the receive step that opened the bridge.

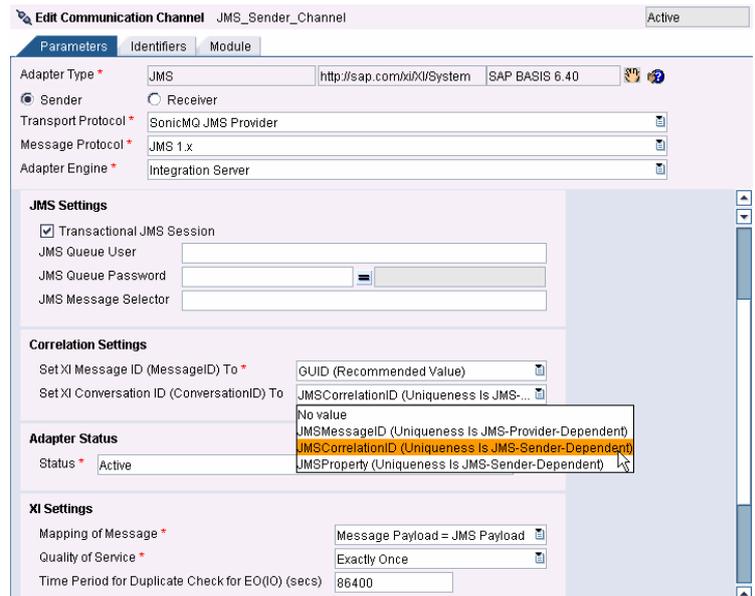


6. Start the *Integration Builder (Configuration)*.

In the receiver communication channel, set the *JMS Correlation ID* to the *XI Conversation ID*.



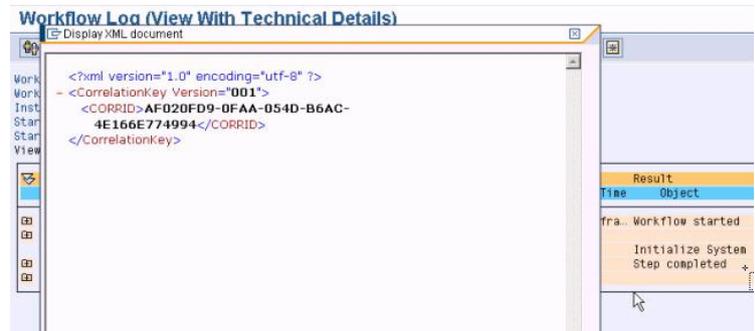
- In the sender communication channel, set the *XI Conversation ID* to the *JMS Correlation ID*.



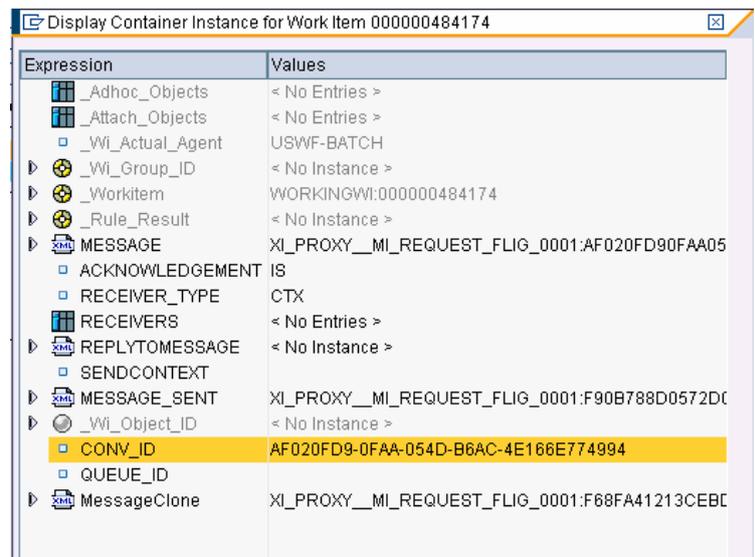
- In the following, the settings are verified using different monitoring tools.

Run the scenario by calling the process synchronously.

Enter the Business Process Engine (BPE) Monitoring (transaction `SXMB_MONI_BPE`), and check the correlation. It must contain the *XI Message ID* of the JMS request message.

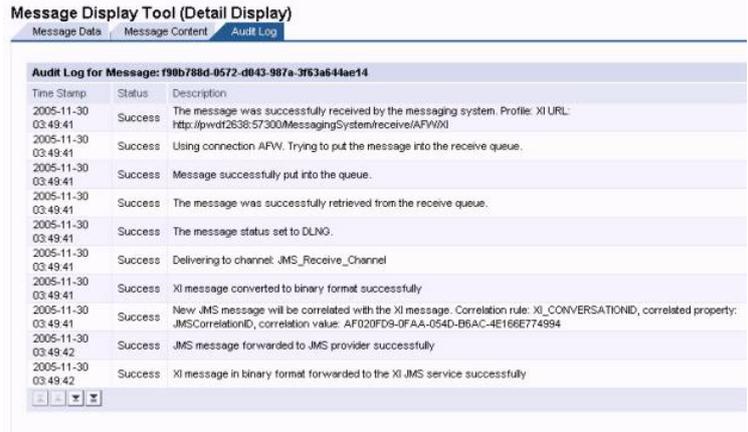


- In the BPE Monitoring, check the *Conversation ID* of the JMS request message.



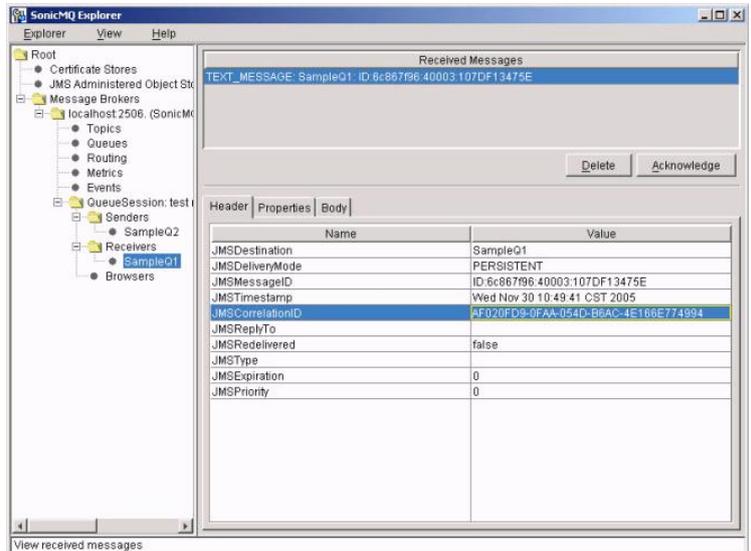
- Start the *Runtime Workbench* (RWB) and navigate to Message Monitoring for the J2EE Adapter Engine.

In the Audit Log of the JMS request message, the correlation-related information is displayed.

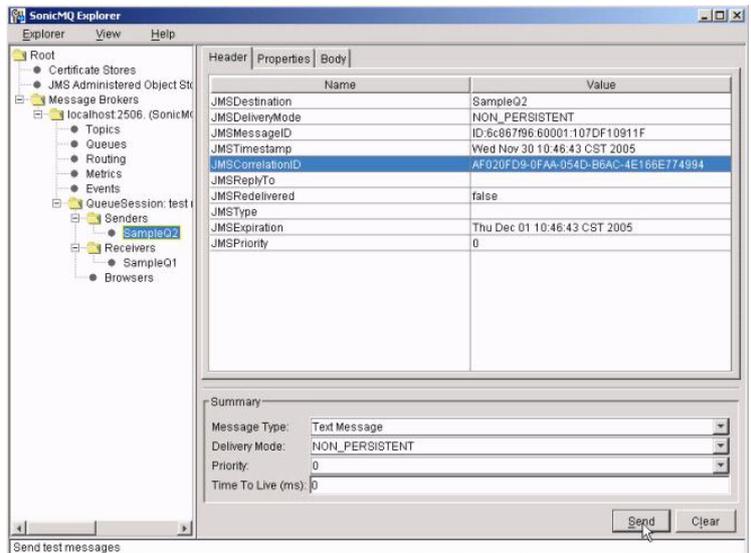


- Start the JMS Broker. Here, SonicMQ is used.

For the received message in the queue, the *JMS Correlation ID* contains the *XI Message ID* of the JMS request message.



- Before sending the JMS response message to the reply queue, maintain the *JMS Correlation ID* accordingly. Here, the *JMS Correlation ID* of the JMS request message is used (references the *XI Message ID*).



13. In BPE Monitoring you can see that the JMS response message is correlated to the appropriate business process instance.

Workflow Log (View With Technical Details)

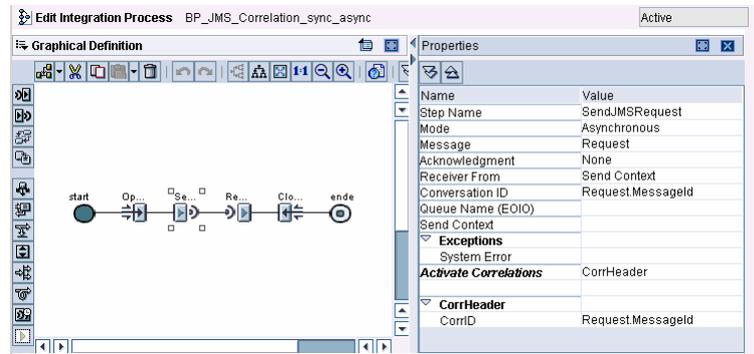
Agent Object Graphic Optimize width [Navigation icons] Choose Save

Workflow: BP_JMS_Correlation_sync_async
 Workflow instance: BP_JMS_Correlation_sync_async urn:01:testframework:jms:correlation
 Instance number: 000000484172
 Start date: 30.11.2005 Started by: BUNDSCHUHAL
 Start time: 03:49:15 Current status: Completed
 View: Workflow chronicle

Error	St	ID	Node Number	Task	Date	Time	Resu
Error Agent				Executed Action			
			484172	1 BP_JMS_Correlation_sync_async urn:01:testfra.. Work			
			484173	4 Start Message: OpenBridge			
				10 Initialize System Element			Init
			484174	16 Send Message Asynchronously			Step
			484175	21 ReceiveJMSResponse			XI_P
			484176	26 S/A Bridge: Response to Synchronous Request			erfo

3.2 BPM Header-Based Sync/Async Bridge – JMS Response Referencing JMS Message ID of Request, prior to SP16

14. Use the same sync/async bridge as in variant 3.1, that is, keep the settings for the BPM process unchanged.

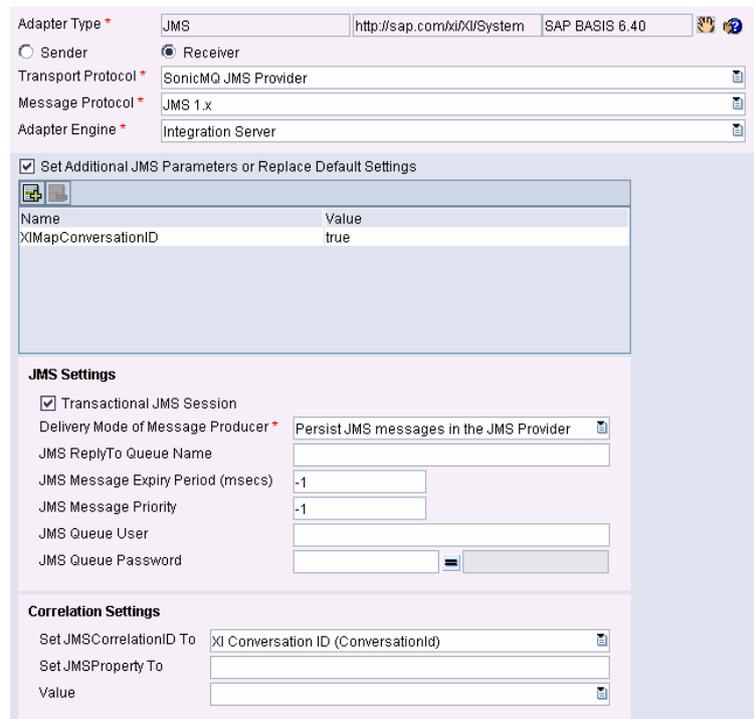


15. Start the *Integration Builder (Configuration)*.

Maintain the Receiver Communication Channel as follows:

Set the *JMS Correlation ID* to the *XI Conversation ID*.

Select the *Set Additional JMS Parameters or Replace Default Settings* indicator, and maintain the parameter with *Name* *XIMapConversationID*, and *Value* *true*.



- Maintain the Sender Communication Channel as follows:

Set the *XI Conversation ID* to the *JMS Correlation ID*.

Select the *Set Additional JMS Parameters or Replace Default Settings* indicator and maintain the parameter with *Name* `XIConversationID`, and *Value* `XI_COR_XIJMSMAP`.

Adapter Type * JMS `http://sap.com/xi/XI/System` SAP BASIS 6.40

Sender Receiver

Transport Protocol * SonicMQ JMS Provider

Message Protocol * JMS 1.x

Adapter Engine * Integration Server

Set Additional JMS Parameters or Replace Default Settings

Name	Value
XIConversationID	XI_COR_XIJMSMAP

JMS Settings

Transactional JMS Session

JMS Queue User

JMS Queue Password =

JMS Message Selector

Correlation Settings

Set XI Message ID (MessageID) To * GUID (Recommended Value)

Set XI Conversation ID (ConversationID) To JMSCorrelationID (Uniqueness Is JMS-...)

Adapter Status

Status * Active

- Run the scenario as described above.

For the outbound JMS request message, the JMS Adapter stores the mapping between the *XI Conversation ID* and the *JMS Message ID*.

Received Messages

TEXT_MESSAGE: SampleQ1: ID:6c867f96-40001-10802F061AB

TEXT_MESSAGE: SampleQ1: ID:6c867f96-40002-10802F93364

TEXT_MESSAGE: SampleQ1: ID:6c867f96-40003-10803091EC7

Delete Acknowledge

Name	Value
JMSDestination	SampleQ1
JMSDeliveryMode	PERSISTENT
JMSMessageID	ID:6c867f96-40003-10803091EC7
JMSTimestamp	Wed Dec 07 10:24:55 CST 2005
JMSCorrelationID	280B229D-58B5-2946-B3AD-A50E7A5F2683
JMSReplyTo	
JMSRedelivered	false
JMSType	
JMSExpiration	0
JMSPriority	0

View received messages

- Before sending the response message to the reply queue, maintain the *JMS Correlation ID* accordingly. Here, the *JMS Message ID* of the JMS request message is used.

Name	Value
JMSDestination	SampleQ2
JMSDeliveryMode	NON_PERSISTENT
JMSMessageID	ID:6c867f96-10003-108030A7DDF
JMSTimestamp	Wed Dec 07 10:26:25 CST 2005
JMSCorrelationID	ID:6c867f96-40003-10803091EC7
JMSReplyTo	
JMSRedelivered	false
JMSType	
JMSExpiration	Thu Dec 08 10:26:25 CST 2005
JMSPriority	0

Summary

Message Type: Text Message

Delivery Mode: NON_PERSISTENT

Priority: 0

Time To Live (ms): 0

Send Clear

Send test messages

19. For the incoming JMS response message, the JMS Adapter maps the *JMS Correlation ID* (referencing the request's *JMS Message ID*) to the *XI Conversation ID* using the stored mapping.

As can be seen in Message Monitoring (transaction *SXMB_MONI*), the *XI Conversation ID* contains the request's *XI Message ID* that is used for the correlation within BPM.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<!-- Response -->
- <SAP:Main xmlns:SAP="http://sap.com/xi/XI/Message/30"
  xmlns:SOAP="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:wsu="http://www.docs.oasis-open.org/wss/2004/01/oasis-200401-wss-
  wssecurity-utility-1.0.xsd" versionMajor="003" versionMinor="000"
  SOAP:mustUnderstand="1" wsu:Id="wsuid-main-
  92ABE13F5C59AB7FE10000000A1551F7">
  <SAP:MessageClass>ApplicationMessage</SAP:MessageClass>
  <SAP:ProcessingMode>asynchronous</SAP:ProcessingMode>
  <SAP:MessageId>E2B9A300-66C8-11DA-8201-003005470BE4</SAP:MessageId>
  <SAP:ConversationId>280B229D-58B5-2946-B3AD-
  A50E7A5F2683</SAP:ConversationId>
  <SAP:TimeSent>2005-12-07T02:26:34Z</SAP:TimeSent>
- <SAP:Sender>
  <SAP:Service>JMS_service</SAP:Service>
  <SAP:Interface
    namespace="urn:01:testframework:jms:correlation">MI_JMS_outbound</SAP:Interface
  </SAP:Sender>
- <SAP:Receiver>
  <SAP:Party agency="" scheme="" />
  <SAP:Service>BP_JMSCorrelation_sync</SAP:Service>
  <SAP:Interface
    namespace="urn:01:testframework:jms:correlation">MI_Response_FlightList_abstrak
  </SAP:Receiver>
```

20. If the JMS application sends back a response in which the JMS correlation ID is not set to the JMS message ID of the original request, the XI conversation ID cannot be determined. Instead, the JMS correlation ID is set as the XI conversation ID; however, the BPM process is then not able to assign the response correctly.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<!-- Response -->
- <SAP:Main xmlns:SAP="http://sap.com/xi/XI/Message/30"
  xmlns:SOAP="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:wsu="http://www.docs.oasis-open.org/wss/2004/01/oasis-200401-wss-
  wssecurity-utility-1.0.xsd" versionMajor="003" versionMinor="000"
  SOAP:mustUnderstand="1" wsu:Id="wsuid-main-
  92ABE13F5C59AB7FE10000000A1551F7">
  <SAP:MessageClass>ApplicationMessage</SAP:MessageClass>
  <SAP:ProcessingMode>asynchronous</SAP:ProcessingMode>
  <SAP:MessageId>60E358B0-66CA-11DA-C914-003005470BE4</SAP:MessageId>
  <SAP:ConversationId>ID:6c867f96:40004:10803130A2D</SAP:ConversationId>
  <SAP:TimeSent>2005-12-07T02:37:15Z</SAP:TimeSent>
- <SAP:Sender>
  <SAP:Service>JMS_service</SAP:Service>
  <SAP:Interface
    namespace="urn:01:testframework:jms:correlation">MI_JMS_outbound</SAP:Interface
  </SAP:Sender>
- <SAP:Receiver>
  <SAP:Party agency="" scheme="" />
  <SAP:Service>BP_JMSCorrelation_sync</SAP:Service>
  <SAP:Interface
```

3.3 BPM Header-Based Sync/Async Bridge – JMS Response Referencing JMS Message ID of Request, as of SP16

Apart from the configuration of the receiver and sender communication channels, all settings keep unchanged compared to variant 3.2.

21. Start the *Integration Builder (Configuration)*.

Maintain the Receiver Communication Channel as follows:

Set the *JMS Correlation ID* to the *XI Conversation ID*.

Set the *Store JMSCorrelationId of request* indicator in order to save the *JMS Correlation ID* of the request message.

Adapter Type * JMS http://sap.com/xi/XI/System SAP BASIS 6.40

Sender Receiver

Transport Protocol * SonicMQ JMS Provider

Message Protocol * JMS 1.x

Adapter Engine * Integration Server

JMS Settings

Transactional JMS Session

Delivery Mode of Message Producer * Persist JMS messages in the JMS Provider

JMS ReplyTo Queue Name

JMS Message Expiry Period (msecs) -1

JMS Message Priority -1

JMS Queue User

JMS Queue Password

Correlation Settings

Set JMSCorrelationID To XI Conversation ID (ConversationId)

Store JMSCorrelationId of request

Set JMSProperty To

Value

Adapter Status

Status * Active

22. Maintain the Sender Communication Channel as follows:

Set the *XI Conversation ID* to *Stored JMSCorrelationId of request* referring to the saved *JMS Correlation ID* of the request message.

Adapter Type * JMS http://sap.com/xi/XI/System SAP BASIS 6.40

Sender Receiver

Transport Protocol * SonicMQ JMS Provider

Message Protocol * JMS 1.x

Adapter Engine * Integration Server

JMS Settings

Transactional JMS Session

JMS Queue User

JMS Queue Password

JMS Message Selector

Correlation Settings

Set XI Message ID (MessageID) To * GUID (Recommended Value)

Set XI Conversation ID (ConversationID) To Stored JMSCorrelationId of request

Adapter Status

Status * Active

XI Settings

Mapping of Message * Message Payload = JMS Payload

Quality of Service * Exactly Once

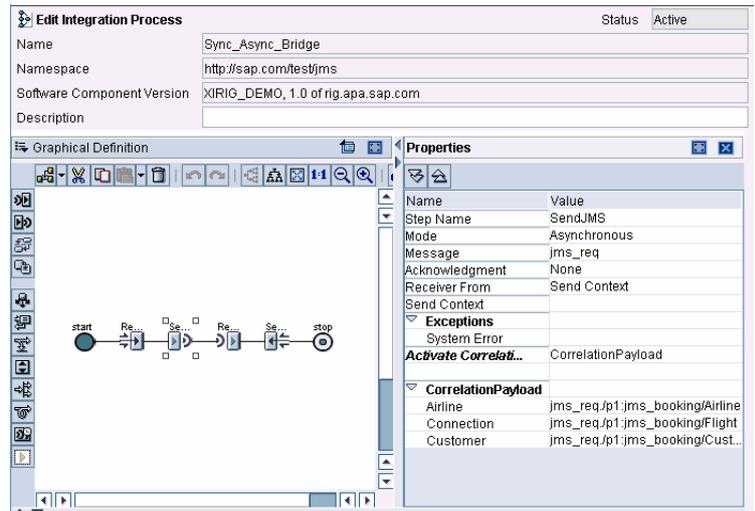
Time Period for Duplicate Check for EO(IO) (secs) 86400

Dropdown menu options:
 No value
 JMSMessageID (Uniqueness Is JMS-Provider-Dependent)
 JMSCorrelationID (Uniqueness Is JMS-Sender-Dependent)
 JMSProperty (Uniqueness Is JMS-Sender-Dependent)
 Stored JMSCorrelationId of request

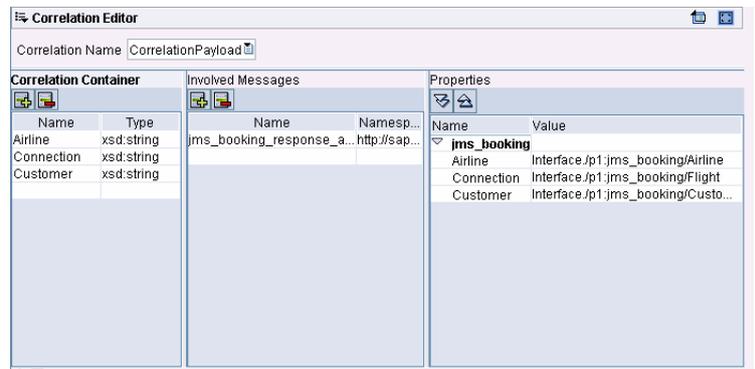
3.4 BPM Payload-Based Sync/Async Bridge

23. Start the Integration Process Editor within the *Integration Builder (Design)*.

For the send step of the JMS request message, maintain a BPM correlation using appropriate payload data.



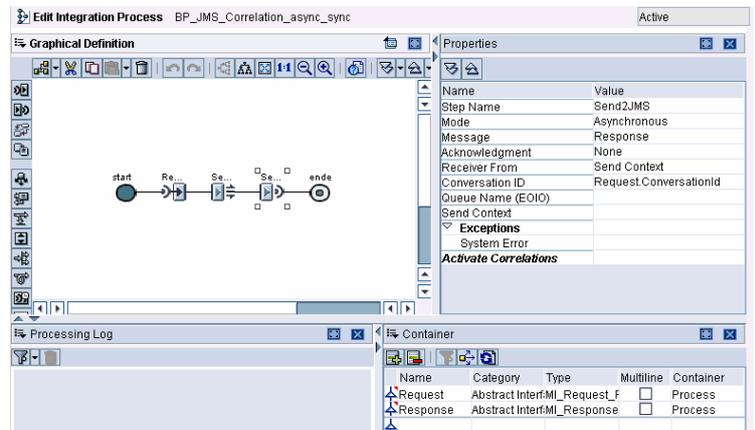
24. For the JMS response message, maintain the BPM correlation using appropriate payload data.



3.5 BPM Header-Based Async/Sync Bridge – Correlation by using the XI Conversation ID

25. Start the Integration Process Editor in the *Integration Builder (Design)*.

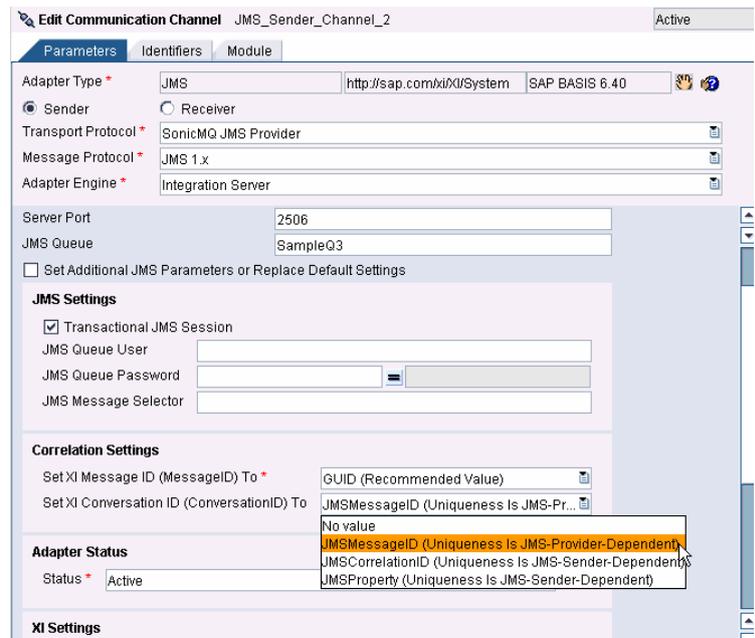
For the send step of the JMS response message, set the Conversation ID to equal the Conversation ID of the JMS request message.



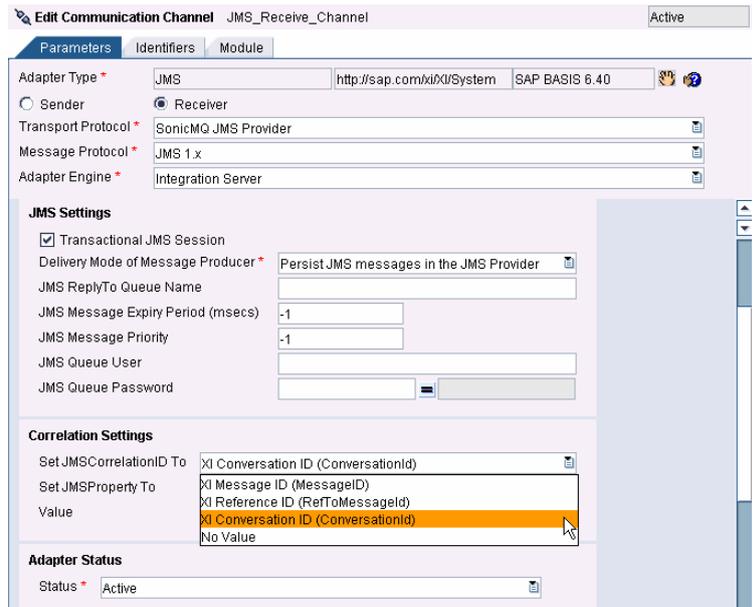
26. Start the *Integration Builder (Configuration)*.

In the sender communication channel, set the XI Conversation ID to the JMS Message ID.

(Alternatively, you can set the XI Conversation ID to the JMS Correlation ID).

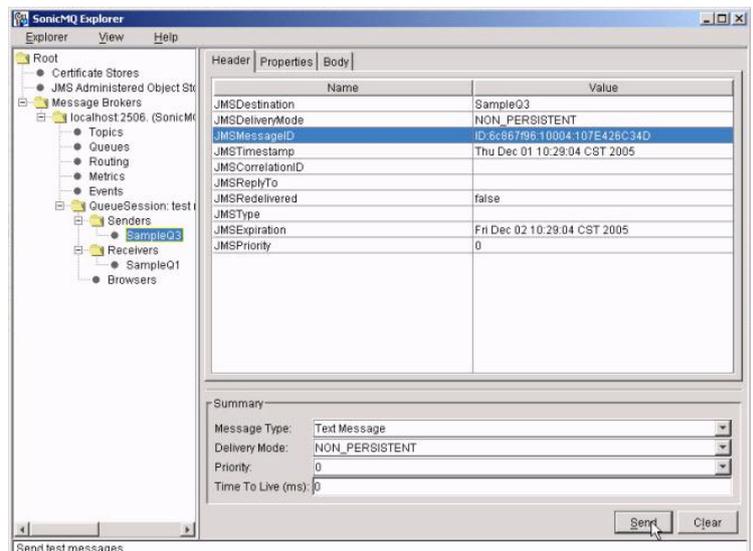


27. In the Receiver Communication Channel, set the *JMS Correlation ID* to the *XI Conversation ID*.

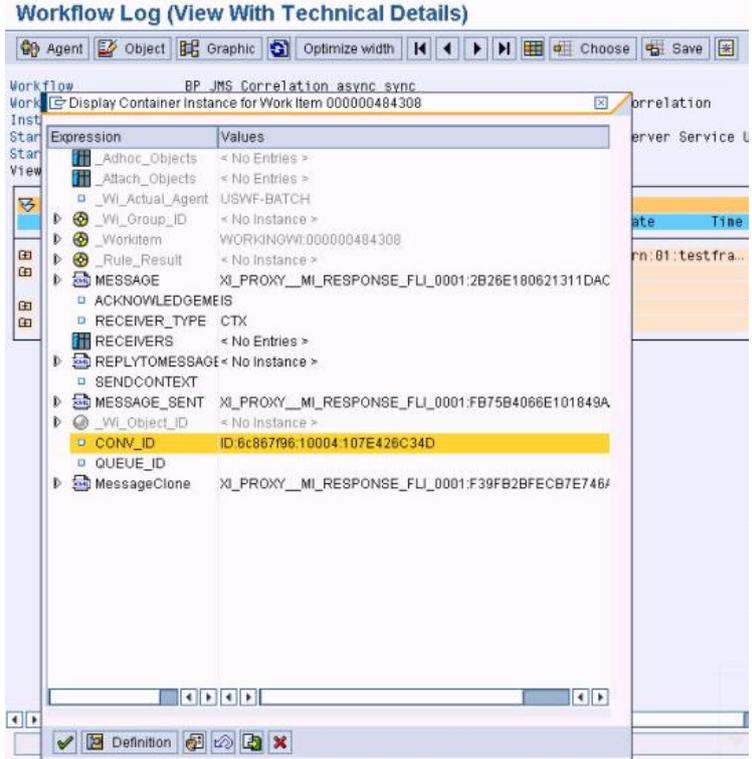


28. Send a request message to the sender queue.

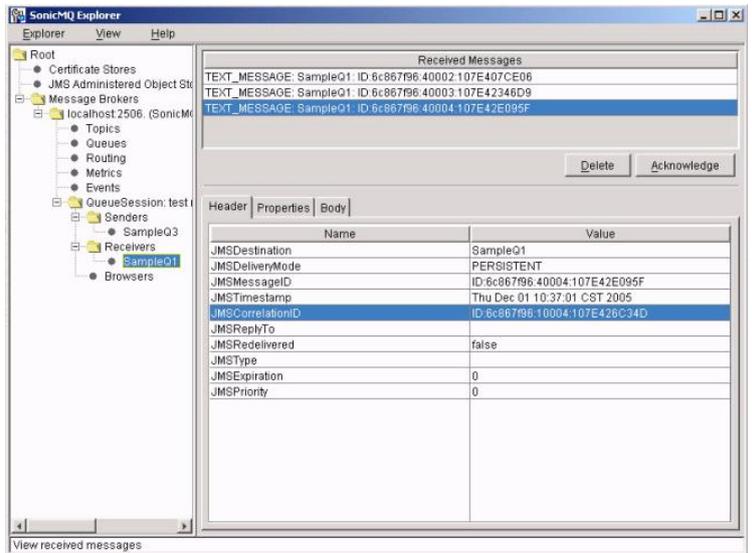
(Alternatively, if you have chosen *JMS Correlation ID* in the Sender Communication Channel above, maintain a unique *JMS Correlation ID* before sending the request message to the sender queue)



29. The XI Conversation ID references the *JMS Message ID* of the JMS request message.



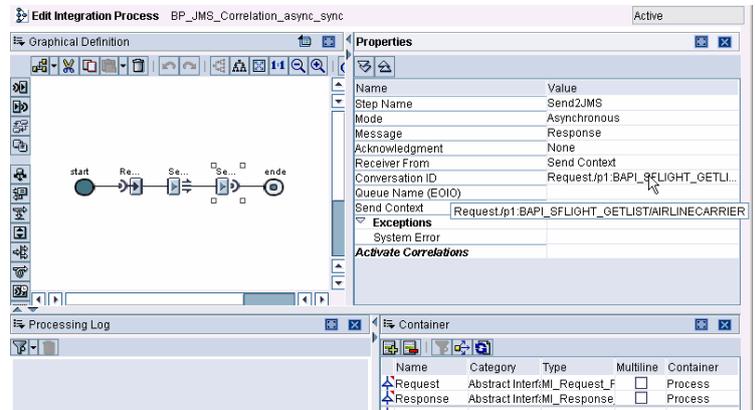
30. For the message in the receiver queue, the *JMS Correlation ID* references the *JMS Message ID* of the JMS request message.



3.6 BPM Payload-Based Async/Sync Bridge – Correlation by using the XI Conversation ID

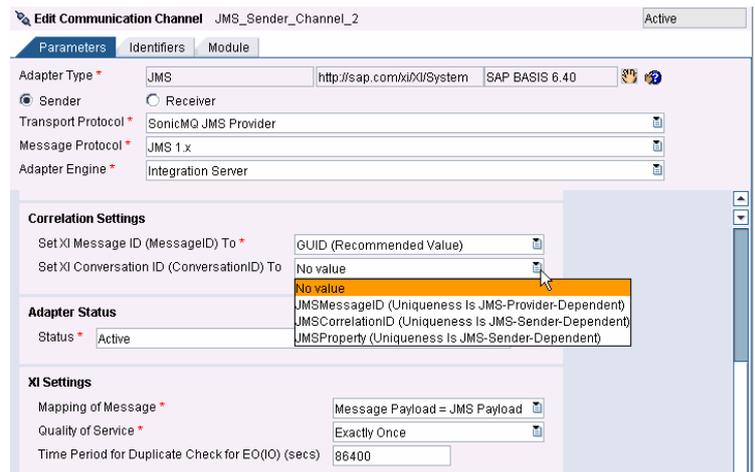
31. Start the Integration Process Editor in the *Integration Builder (Design)*.

For the send step of the JMS response message, set the Conversation ID to equal any payload field of the JMS request message.

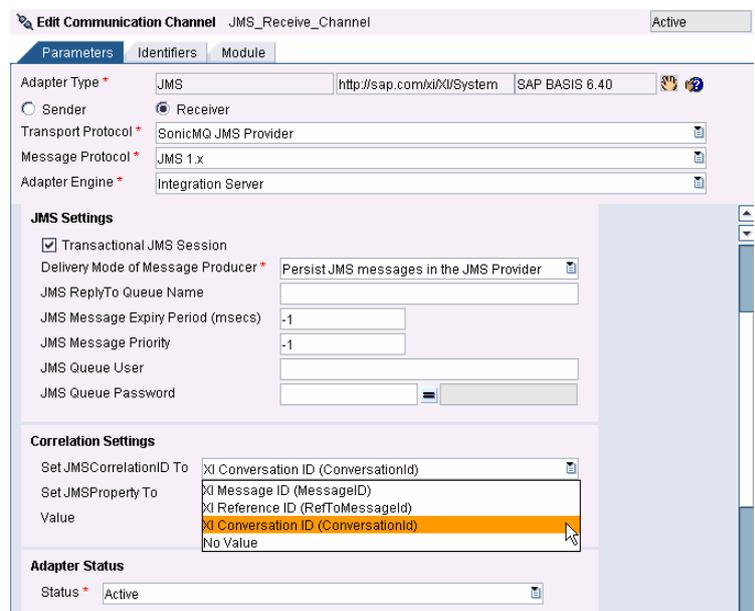


32. Start the *Integration Builder (Configuration)*.

In the Sender Communication Channel, you don't need to map any JMS header fields to the *XI Conversation ID*. Choose *No Value*.



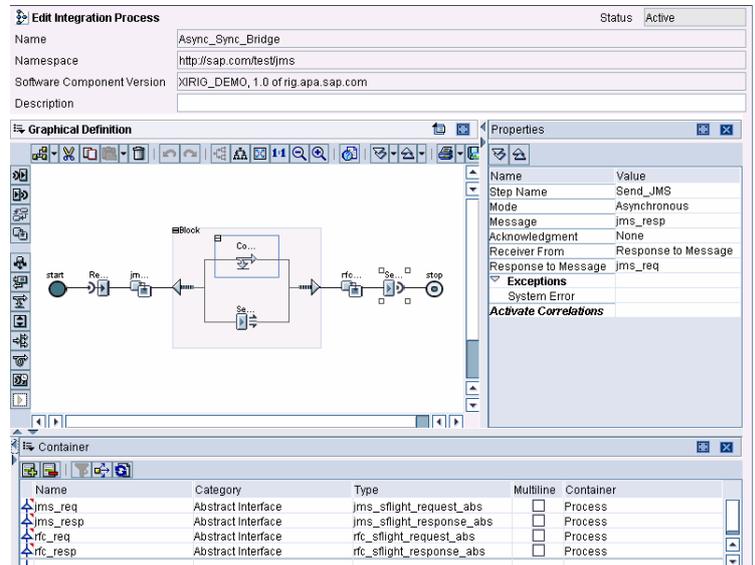
33. In the Receiver Communication Channel, set the *JMS Correlation ID* to the *XI Conversation ID*.



3.7 BPM Header-Based Async/Sync Bridge – Correlation by using the XI Message ID

34. Start the Integration Process Editor in the *Integration Builder (Design)*.

For the send step of the JMS response message, set the mode to *Response to Message* and refer to the JMS request message.

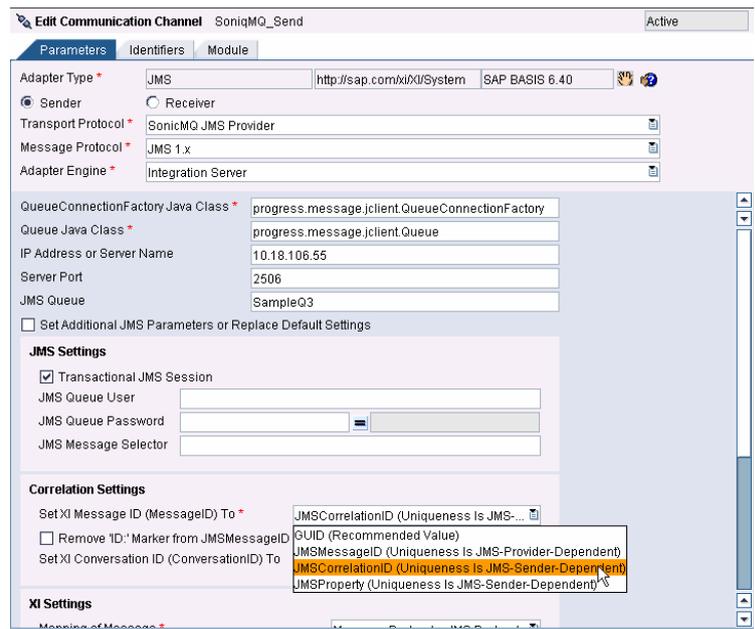


35. Start the *Integration Builder (Configuration)*.

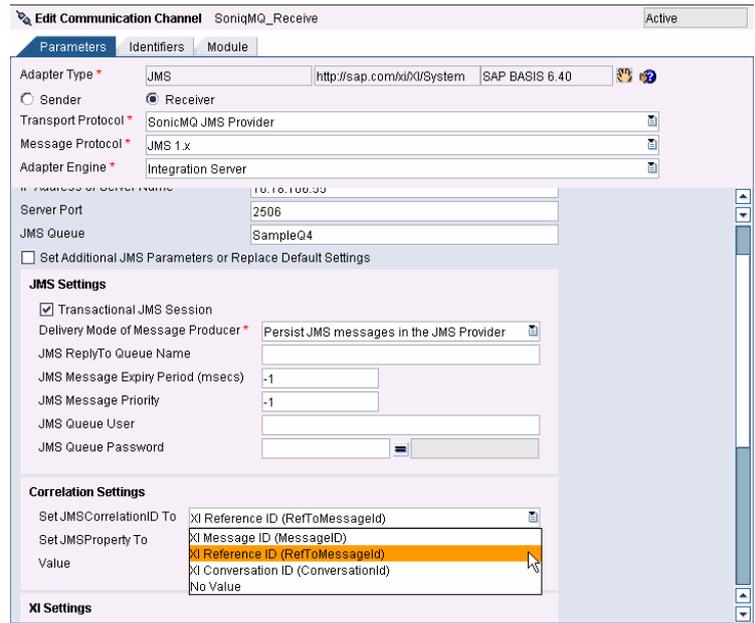
In the Sender Communication Channel, set the *XI Message ID* to the *JMS Correlation ID*.

(Alternatively, you can set the *XI Message ID* to the *JMS Message ID*)

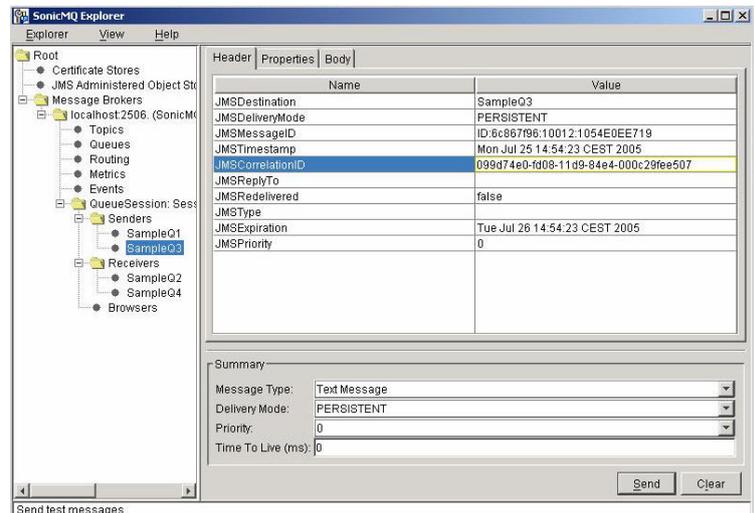
In any case, you have to ensure that the *XI Message ID* is unique and complies with ISO-11578. Otherwise messaging fails.



36. In the Receiver Communication Channel, set the *JMS Correlation ID* to the *XI Reference ID* (*RefToMessageID*).

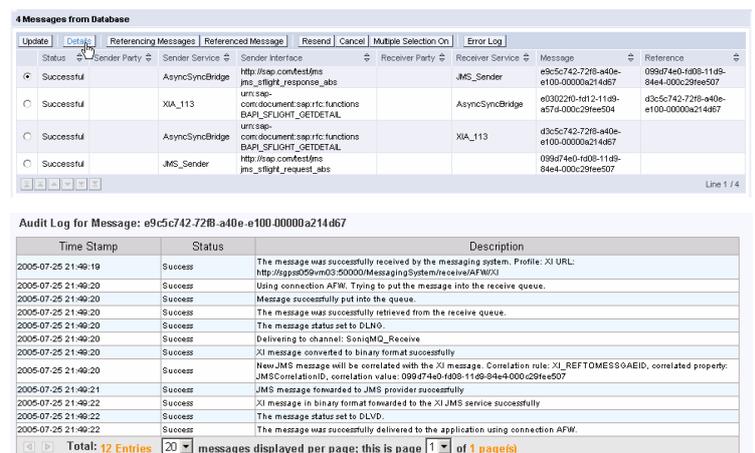


37. For the message in the sender queue, enter a valid GUID (see above) in the *JMS Correlation ID*.

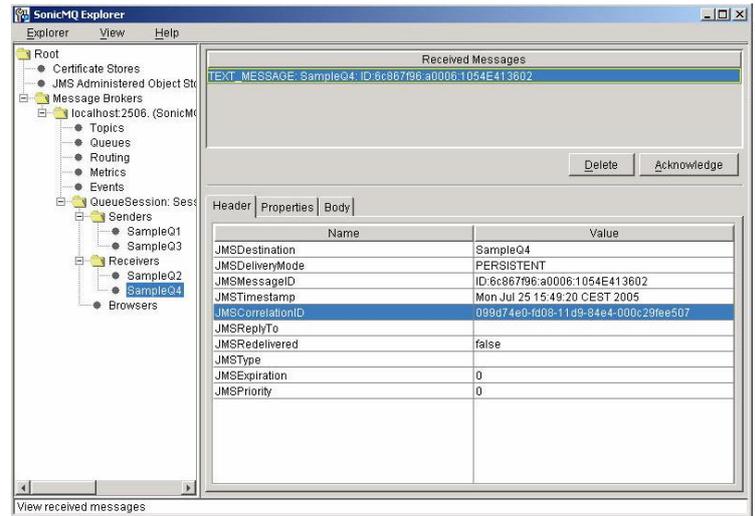


38. Start the RWB and navigate to Message Monitoring for the J2EE Adapter Engine.

In the Audit Log of the JMS response message, you can see the *correlation rule*, the *correlated property*, and the *correlation value*.



39. For the message in the receiver queue, the *JMS Correlation ID* references the *XI Message ID*, and the *JMS Correlation ID* of the JMS request message, respectively.



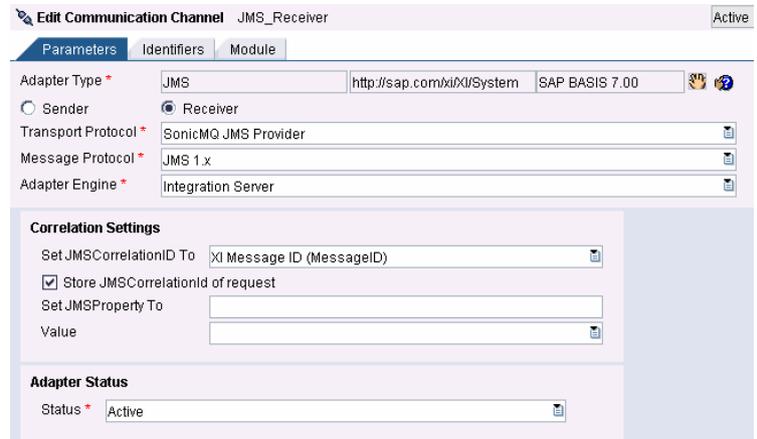
3.8 Sync/Async Bridge in Receiver JMS Adapter

40. Start the *Integration Builder (Configuration)*.

Maintain the Receiver Communication Channel as follows:

Set the *JMS Correlation ID* to the *XI Message ID*.

Set the *Store JMSCorrelationId of request* indicator in order to save the *JMS Correlation ID* of the request message.



41. Switch to tab *Module* to add respective modules in the module processor in the sequence as shown in figure on the right side.

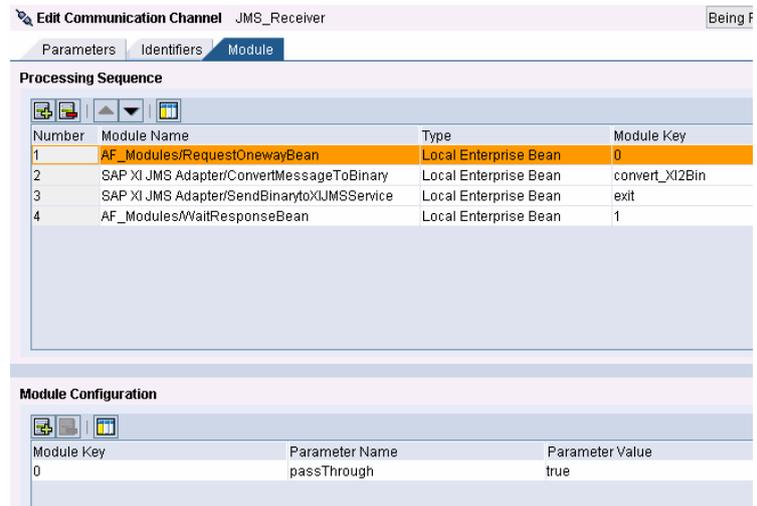
Add *AF_Modules/RequestOnewayBean* module first in the module sequence.

For the *AF_Modules/RequestOnewayBean*, maintain parameter with name *passThrough*, and value *true*.

The synchronous request message is converted to an asynchronous request message, and passed to the next module in sequence.

Add *AF_Modules/WaitResponseBean* module last in the module sequence.

The module waits for a response message.



42. Maintain the Sender Communication Channel as follows:

Set the *XI Conversation ID* to *Stored JMSCorrelationId of request* referring to the saved *JMS Correlation ID* of the request message.



43. Switch to tab *Module* to add respective modules in the module processor in the sequence as shown in figure on the right side.

Replace the *CallSapAdapter* module by the *AF_Modules/NotifyResponseBean* module.



The asynchronous response message is passed to the *WaitResponseBean* of the receiver channel.

44. Start the *RWB*, and navigate to the Message Monitoring for the J2EE Adapter Engine.

According to the Audit Log for the synchronous request message, the message processing is as follows:

- In the *RequestOnewayBean* module the synchronous request message is converted to an asynchronous message.
- The asynchronous JMS request message is correlated to the respective XI message.
- The *WaitResponseBean* module is called to wait for the asynchronous response message. Upon receipt, the message is sent as synchronous response to the waiting synchronous request message.

Audit Log for Message: af5e8a45-582d-6c22-e100-0000a214d72

Time Stamp	Status	Description
2006-12-21 17:20:59	Success	Message successfully received by messaging system. Profile: XI URL: http://sgss059vm14.sin.sap.corp:52500/MessagingSystem/receive/AFW/XI Credential (User): PISUSER
2006-12-21 17:20:59	Success	Using connection JMS_http://sap.com/xi/XI/System. Trying to put the message into the request queue.
2006-12-21 17:20:59	Success	Message successfully put into the queue.
2006-12-21 17:20:59	Success	The message was successfully retrieved from the request queue.
2006-12-21 17:20:59	Success	The message status set to DLNG.
2006-12-21 17:20:59	Success	Delivering to channel JMS_Receiver
2006-12-21 17:20:59	Success	MP: entering
2006-12-21 17:20:59	Success	MP: processing local module localejbs/AF_Modules/RequestOnewayBean
2006-12-21 17:20:59	Success	ROB: entering RequestOnewayBean
2006-12-21 17:20:59	Success	ROB: forwarding the request message

Audit Log for Message: af5e8a45-582d-6c22-e100-0000a214d72

Time Stamp	Status	Description
2006-12-21 17:20:58	Success	ROB: leaving RequestOnewayBean
2006-12-21 17:20:58	Success	MP: processing local module localejbs/SAP XI JMS Adapter/ConvertMessageToBinary
2006-12-21 17:20:58	Success	XI message converted to binary format successfully
2006-12-21 17:20:58	Success	MP: processing local module localejbs/SAP XI JMS Adapter/SendBinarytoXJMSService
2006-12-21 17:20:58	Success	New JMS message will be correlated with the XI message. Correlation rule: XI_MESSAGEID, correlated property: JMSCorrelationID, correlation value: af5e8a45-582d-6c22-e100-0000a214d72
2006-12-21 17:20:58	Success	JMS message forwarded to JMS provider successfully
2006-12-21 17:20:58	Success	XI message in binary format forwarded to the XI JMS service successfully
2006-12-21 17:20:58	Success	MP: processing local module localejbs/AF_Modules/WaitResponseBean
2006-12-21 17:20:58	Success	WRB: entering WaitResponseBean
2006-12-21 17:20:58	Success	WRB: retrieving the message for af5e8a45-582d-6c22-e100-0000a214d72 ...

45. The Audit Log for the asynchronous response message indicates that the *NotifyResponseBean* module has been called to pass the message to the module processor of the respective receiver channel.

Audit Log for Message: af5e8a45-582d-6c22-e100-0000a214d72		
Time Stamp	Status	Description
2006-12-21 17:21:51	Success	WRB: retrieved the message: ApplicationResponse
2006-12-21 17:21:51	Success	WRB: leaving WaitResponseBean
2006-12-21 17:21:51	Success	MP: leaving
2006-12-21 17:21:51	Success	The message status set to DLVD.
2006-12-21 17:21:52	Success	The message was successfully delivered to the application using connection JMS_http://sap.com/xi/XISystem.

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Audit Log for Message: b1402880-90d4-11db-8ccd-000c29465963		
Time Stamp	Status	Description
2006-12-21 17:21:51	Success	New JMS message with JMS message ID ID:6c867f96:1000a:10FA449A818 received. The XI message ID for this message is b1402880-90d4-11db-8ccd-000c29465963
2006-12-21 17:21:51	Success	JMS message converted to XI message format successfully
2006-12-21 17:21:51	Success	NRB: entering NotifyResponseBean
2006-12-21 17:21:51	Success	NRB: notifying the receiver for af5e8a45-582d-6c22-e100-0000a214d72 ...
2006-12-21 17:21:51	Success	Application attempting to send an XI message asynchronously using connection AFW.
2006-12-21 17:21:51	Success	Trying to put the message into the send queue.
2006-12-21 17:21:51	Success	The response message for message af5e8a45-582d-6c22-e100-0000a214d72(NBOUND) was successfully transmitted to the calling application.
2006-12-21 17:21:51	Success	The message status set to DLVD.
2006-12-21 17:21:51	Success	The application sent the message asynchronously using connection AFW. Returning to application.
2006-12-21 17:21:52	Success	NRB: notified

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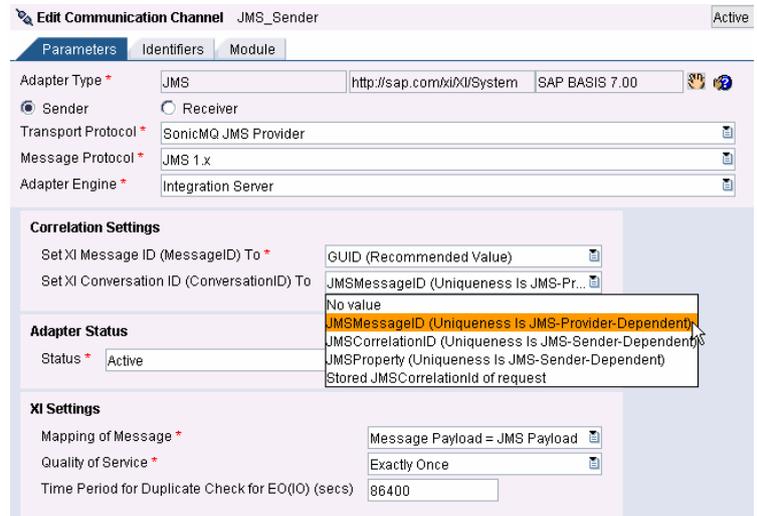
Audit Log for Message: b1402880-90d4-11db-8ccd-000c29465963		
Time Stamp	Status	Description
2006-12-21 17:21:52	Success	NRB: leaving NotifyResponseBean
2006-12-21 17:21:52	Success	MP: leaving
2006-12-21 17:21:52	Success	JMS message delivered to XI successfully

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3.9 Async/Sync Bridge in Sender JMS Adapter

46. Start the *Integration Builder (Configuration)*.

In the JMS Sender Communication Channel, set the *XI Conversation ID* to the *JMS Message ID*.



47. Switch to tab *Module* to add respective modules in the module processor in the sequence as shown in figure on the right side.

Add `AF_Modules/RequestResponseBean` module before the `CallSapAdapter` module.

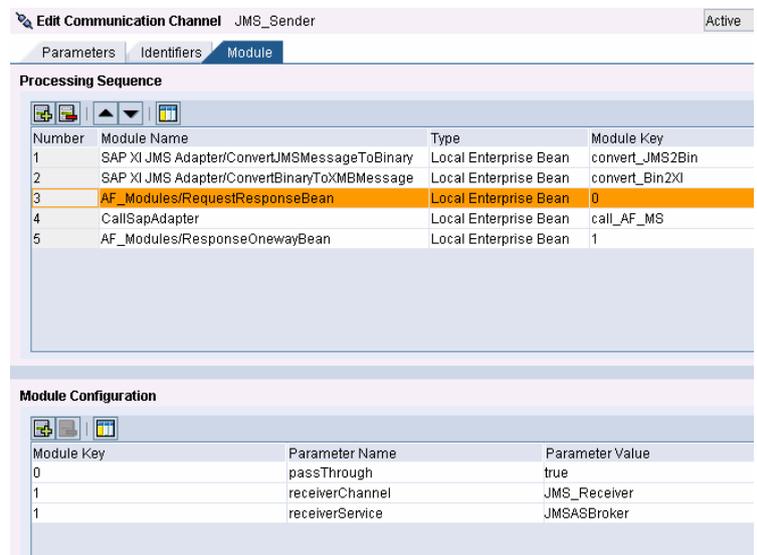
For the `AF_Modules/RequestResponseBean`, maintain parameter with name `passThrough`, and value `true`.

The asynchronous request message is converted to a synchronous request message, and passed to the next module in sequence, here `CallSapAdapter`.

Add `AF_Modules/ResponseOnewayBean` module after the `CallSapAdapter` module.

For the `AF_Modules/ResponseOnewayBean`, maintain parameters as follows:

- name `receiverParty` with value `<name of receiver party>`
- name `receiverService` with value `<name of receiver`



service>

- name receiverChannel with value <name of JMS receiver channel>

The synchronous response message is converted to an asynchronous message, and passed to the specified receiver channel.

48. In the JMS Receiver Communication Channel, set the *JMS Correlation ID* to the *XI Conversation ID*.

Edit Communication Channel JMS_Receiver Active

Parameters Identifiers Module

Adapter Type * JMS http://sap.com/xi/XI/System SAP BASIS 7.00

Sender Receiver

Transport Protocol * SonicMQ JMS Provider

Message Protocol * JMS 1.x

Adapter Engine * Integration Server

Correlation Settings

Set JMSCorrelationID To

Store JMSCorrelationID

Set JMSProperty To

Value

Adapter Status

Status *

49. Start the *RWB*, and navigate to the Message Monitoring for the J2EE Adapter Engine.

The Audit Log for the request message indicates that the *RequestResponseBean* module has been called, and a synchronous message has been passed to the messaging system.

Audit Log for Message: 2868a250-90c3-11db-a98f-000c29465863

Time Stamp	Status	Description
2006-12-21 15:16:20	Success	New JMS message with JMS message ID:6c867f96:10001:10FA2C72240 received. The XI message ID for this message is 2868a250-90c3-11db-a98f-000c29465863
2006-12-21 15:16:20	Success	JMS message converted to XI message format successfully
2006-12-21 15:16:20	Success	RRB: entering RequestResponseBean
2006-12-21 15:16:20	Success	RRB: suspending the transaction
2006-12-21 15:16:20	Success	RRB: passing through ...
2006-12-21 15:16:20	Success	RRB: leaving RequestResponseBean
2006-12-21 15:16:20	Success	Application attempting to send an XI message synchronously using connection AFV.
2006-12-21 15:16:20	Success	Trying to put the message into the call queue.
2006-12-21 15:16:20	Success	Message successfully put into the queue.
2006-12-21 15:16:20	Success	The message was successfully retrieved from the call queue.

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50. The Audit Log for the response message indicates that the *ResponseOnewayBean* module has been called.

Audit Log for Message: 32f633e0-90c3-11db-91e3-000c29465863

Time Stamp	Status	Description
2006-12-21 15:16:49	Success	Using connection AFV. Trying to put the message into the receive queue.
2006-12-21 15:16:49	Success	The XI response message for message 32f633e0-90c3-11db-91e3-000c29465863(INBOUND) was successfully returned to the calling application.
2006-12-21 15:16:49	Success	The message status set to DLVD.
2006-12-21 15:16:49	Success	ROB: entering ResponseOnewayBean
2006-12-21 15:16:49	Success	ROB: resuming the transaction
2006-12-21 15:16:49	Success	ROB: calling the module processor ...
2006-12-21 15:16:49	Success	MP: entering
2006-12-21 15:16:49	Success	MP: processing local module localejbs/SAP XI JMS Adapter/ConvertMessageToBinary
2006-12-21 15:16:49	Success	XI message converted to binary format successfully
2006-12-21 15:16:49	Success	MP: processing local module localejbs/SAP XI JMS Adapter/SendBinarytoXIMService

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Audit Log for Message: 32f633e0-90c3-11db-91e3-000c29465863

Time Stamp	Status	Description
2006-12-21 15:16:49	Success	New JMS message will be correlated with the XI message. Correlation rule: XI_CONVERSATIONID, correlated property: JMSCorrelationID, correlation value: ID:6c867f96-10001-10FA2c72240
2006-12-21 15:16:50	Success	JMS message forwarded to JMS provider successfully
2006-12-21 15:16:51	Success	XI message in binary format forwarded to the XI JMS service successfully
2006-12-21 15:16:51	Success	MP: leaving
2006-12-21 15:16:51	Success	ROB: returned with response: false
2006-12-21 15:16:51	Success	ROB: leaving ResponseOnewayBean
2006-12-21 15:16:51	Success	MP: leaving



www.sdn.sap.com/irj/sdn/howtoguides