JBoss Enterprise Application Platform 4.3

JBoss Messaging User Guide CP08

for Use with JBoss Enterprise Application Platform 4.3 Cumulative Patch 8

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This book is about JBoss Messaging 1.4

Introduction

JBoss Messaging provides an open source and standards-based messaging platform that brings enterprise-class messaging to the mass market.

JBoss Messaging implements a high performance, robust messaging core that is designed to support the largest and most heavily utilized SOAs, enterprise service buses (ESBs) and other integration needs ranging from the simplest to the highest demand networks.

It will allow you to smoothly distribute your application load across your cluster, intelligently balancing and utilizing each nodes CPU cycles, with no single point of failure, providing a highly scalable and performant clustering implementation.

JBoss Messaging includes a JMS front-end to deliver messaging in a standards-based format as well as being designed to be able to support other messaging protocols in the future.

1.1. JBoss Messaging Features

JBoss Messaging provides:

- A fully compatible and Sun certified JMS 1.1 implementation, that currently works with a standard 4.2 or later JBoss Application Server installation.
- A strong focus on performance, reliability and scalability with high throughput and low latency.
- A foundation for JBoss ESB for SOA initiatives; JBoss ESB uses JBoss Messaging as its default JMS provider.

Other JBoss Messaging features include:

- Publish-subscribe and point-to-point messaging models
- Persistent and non-persistent messages
- Guaranteed message delivery that ensures that messages arrive once and only once where required
- Transactional and reliable - supporting ACID semantics
- Customizable security framework based on JAAS
- Fully integrated with JBoss Transactions (formerly known as Arjuna JTA) for full transaction recoverability.
- Extensive JMX management interface
- Support for most major databases including Oracle, DB2, Sybase, MS SQL Server, PostgreSQL and MySQL
- HTTP transport to allow use through firewalls that only allow HTTP traffic
- Servlet transport to allow messaging through a dedicated servlet.
- SSL transport
- Configurable DLQs (Dead Letter Queues) and Expiry Queues

- Message statistics. Gives you a rolling historical view of what messages were delivered to what queues and subscriptions
- Automatic paging of messages to storage. Allows the use of very large queues - too large to fit in memory at once
- Strict message ordering. JBoss Messaging's implementation of strict message ordering is called message ordering groups. Messages in one ordering group obey strict delivering order, which means that messages in an ordering group will be delivered exactly in the order of their arrival at the target queue (FIFO). Ordering groups can be enabled by either programming APIs or configuration.

Clustering features:

- Fully clustered queues and topics. "Logical" queues and topics are distributed across the cluster. You can send to a queue or a topic from any node, and receive from any other.
- Fully clustered durable subscriptions. A particular durable subscription can be accessed from any node of the cluster - allowing you to spread processing load from that subscription across the cluster.
- Fully clustered temporary queues. Send a message with a replyTo of a temp queue and it can be sent back on any node of the cluster.
- Intelligent message redistribution. Messages are automatically moved between different nodes of the cluster if consumers are faster on one node than another. This can help prevent starvation or build up of messages on particular nodes.
- Message order protection. If you want to ensure that the order of messages produced by a producer is the same as is consumed by a consumer then you can set this to true. This works even in the presence of message redistribution.
- Fully transparent failover. When a server fails, your sessions continue without exceptions on a new node as if nothing happened. (Fully configurable - If you don't want this you can fall back to exceptions being thrown and manually recreation of connections on another node)
- High availability and seamless fail-over. If the node you are connected to fails, you will automatically fail over to another node and will not lose any persistent messages. You can carry on with your session seamlessly where you left off. Once and only once delivery of persistent messages is respected at all times.
- Message bridge. JBoss Messaging contains a message bridge component which enables you to bridge messages between any two JMS1.1 destinations on the same or physical separate locations. (E.g. separated by a WAN). This allows you to connect geographically separate clusters, forming huge globally distributed logical queues and topics.

1.2. Clustering Features

Fully clustered queues and topics

"Logical" queues and topics are distributed across the cluster. You can send to a queue or a topic from any node, and receive from any other.

Fully clustered durable subscriptions

A particular durable subscription can be accessed from any node of the cluster - allowing you to spread processing load from that subscription across the cluster.

Fully clustered temporary queues

Send a message with a **`replyTo`** of a temp queue and it can be sent back on any node of the cluster.

Intelligent message redistribution

Messages are automatically moved between different nodes of the cluster if consumers are faster on one node than another. This can help prevent starvation or build up of messages on particular nodes.

Message order protection

If you want to ensure that the order of messages produced by a producer is the same as is consumed by a consumer then you can set this to true. This works even in the presence of message redistribution.

Fully transparent failover

When a server fails, your sessions continue without exceptions on a new node as if nothing happened. (Fully configurable - If you don't want this you can fall back to exceptions being thrown and manually recreation of connections on another node)

High availability and seamless fail-over

If the node you are connected to fails, you will automatically fail over to another node and will not lose any persistent messages. You can carry on with your session seamlessly where you left off. Once and only once delivery of persistent messages is respected at all times.

Message bridge

JBoss Messaging contains a message bridge component which enables you to bridge messages between any two JMS1.1 destinations on the same or physical separate locations. (E.g. separated by a WAN). This allows you to connect geographically separate clusters, forming huge globally distributed logical queues and topics.

1.3. Compatibility with JBossMQ

JBoss MQ is the JMS implementation currently shipped within JBoss AS. Since JBoss Messaging is JMS 1.1 and JMS 1.0.2b compatible, the JMS code written against JBossMQ will run with JBoss Messaging without any changes.

JBoss Messaging does not have wire format compatibility with JBoss MQ so it would be necessary to upgrade JBoss MQ clients with JBoss Messaging client jars

Important

Even if JBoss Messaging deployment descriptors are very similar to JBoss MQ deployment descriptors, they are *not* identical, so they will require some simple adjustments to get them to work with JBoss Messaging. Also, the database data model

is completely different, so don't attempt to use JBoss Messaging with a JBoss MQ data schema and vice-versa.

Note

JBoss Messaging is built against the JBoss AS 4.2 libraries which are built using Java 5. Therefore JBoss Messaging only runs with Java 5 or later.

1.4. Limitations of JBossMQ

JBossMQ has two fundamental limitations:

- JBossMQ is based on SpyderMQ (the open source project) which is a non-clustered broker.
- The threading model and the overall design of the non-clustered broker leads to performance limitations in certain high load usage scenarios.

Running the Examples

In the directory **`docs/examples/jboss-messaging-examples`**, you will find a set of examples demonstrating JBoss Messaging working in various examples.

Before running these examples, you must deploy the example-destinations located under **`/docs/examples/jboss-messaging-examples/destinations`**

Examples list:

- docs/examples/jboss-messaging-examples/queue

  This example shows a simple send and receive to a remote queue using a JMS client

- docs/examples/jboss-messaging-examples/queue-failover

  This example demonstrates the transparent failover of a JMS consumer.

- docs/examples/jboss-messaging-examples/topic

  This example shows a simple send and receive to a remote topic using a JMS client

- docs/examples/jboss-messaging-examples/mdb

  This example demonstrates usage of an EJB2.1 MDB with JBoss Messaging

- docs/examples/jboss-messaging-examples/ejb3mdb

  This example demonstrates usage of an EJB3 MDB with JBoss Messaging

- docs/examples/jboss-messaging-examples/stateless

  This example demonstrates an EJB2.1 stateless session bean interacting with JBoss Messaging

- docs/examples/jboss-messaging-examples/mdb-failure

  This example demonstrates rollback and redelivery occuring with an EJB2.1 MDB

- docs/examples/jboss-messaging-examples/secure-socket

  This example demonstrates a JMS client interacting with a JBoss Messaging server using SSL encrypted transport

- docs/examples/jboss-messaging-examples/http

  This example demonstrates a JMS client interacting with a JBoss Messaging server tunneling traffic over the HTTP protocol

- docs/examples/jboss-messaging-examples/web-service

  This example demonstrates JBoss web-service interacting with JBoss Messaging

- docs/examples/jboss-messaging-examples/distributed-queue

  This example demonstrates a JMS client interacting with a JBoss Messaging distributed queue - it requires two JBoss AS instances to be running

- docs/examples/jboss-messaging-examples/distributed-topic

  This example demonstrates a JMS client interacting with a JBoss Messaging distributed topic - it requires two JBoss AS instances to be running

- docs/examples/jboss-messaging-examples/stateless-clustered

  This example demonstrates a JMS client interacting with clustered EJB2.1 stateless session bean, which in turn interacts with JBoss Messaging. The example uses HAJNDI to lookup the connection factory

- docs/examples/jboss-messaging-examples/bridge

  This example demonstrates using a message bridge. It deploys a message bridge in JBoss AS which then proceeds to move messages from a source to a target queue

- docs/examples/jboss-messaging-examples/servlet

  This example demonstrates how to use servlet transport with JBoss Messaging. It deploys a servlet and a ConnectionFactory that uses the servlet transport.

- docs/examples/jboss-messaging-examples/ordering-group

  This example demonstrates using strict message ordering with JBoss Messaging. It uses JBoss Messaging ordering group API to deliver strictly ordered messages, regardless of their priorities.

It is highly recommended that you familiarize yourself with the examples.

Make sure you start the JBoss server(s) before running the examples!

The non clustered examples expect a JBoss AS instance to be running with all the default settings

The clustered examples expect two JBoss AS instances to running with ports settings as per ports-01 and ports-02.

For each example, you can always override the default ports it will try to connect to by editing the **`jndi.properties`** file in the particular example directory

Configuration

The JMS API specifies how a messaging client interacts with a messaging server. The exact definition and implementation of messaging services, such as message destinations and connection factories, are specific to JMS providers. JBoss Messaging has its own configuration files to configure services. If you are migrating services from JBossMQ (or other JMS provider) to JBoss Messaging, you will need to understand those configuration files.

In this chapter, we discuss how to configure various services inside JBoss Messaging, which work together to provide JMS API level services to client applications.

The JBoss Messaging service configuration is spread among several configuration files. Depending on the functionality provided by the services it configures, the configuration data is distributed between **`messaging-service.xml`**, **`remoting-bisocket-service.xml`**, **`xxx-persistence-service.xml`** (where xx is the name of your database), **`connection-factories-service.xml`** and **`destinations-service.xml`**.

The AOP client-side and server-side interceptor stacks are configured in **`aop-messaging-client.xml`** and **`aop-messaging-server.xml`**. Normally you will not want to change them, but some of the interceptors can be removed to give a small performance increase, if you don't need them. Be very careful you have considered the security implications before removing the security interceptor.

Clustering will not work with the default database.

JBoss uses HSQLDB as the default database which is *not* a production-ready database. For a JBoss Messaging cluster to work, all nodes must have access to a production-ready shared database. It is therefore necessary to replace the default HSQLDB database with a production-ready shared database.

3.1. System Properties used by JBoss Messaging

3.1.1. support.bytesId

This system property controls the default behavior when constructing a JBossMessage object from a foreign message object. If set to true, the JBossMessage constructor will try to extract the native byte[] correlation ID from the foreign message headers. If set to false, it will use the normal string type JMSCorrelationID. If this system property is absent or is given some value other than 'true' and 'false', it will defaults to 'true'.

3.1.2. retain.oldxabehaviour

This system property controls what kind of exception a JMS XAResource throws when the prepare is called after the connection is broken. If this property is not defined, an XAException with XA_RBCOMMFAIL error code will be thrown. If this propertie is defined, an XAException with XA_RETRY error code will be thrown instead. JBM by default doesn't define this property.

3.1.3. mapmessage.support.null.object

This system property, once defined, allows null values in MapMessage.setObject(String key, Object value). JBM by default doesn't define this property, which means passing null values to the setObject() method will cause a MessageFormatException to be thrown.

3.2. Configuring the ServerPeer

The Server Peer is the heart of the JBoss Messaging JMS facade. The server's configuration, resides in **`messaging-service.xml`** configuration file.

All JBoss Messaging services are rooted at the server peer

An example of a Server Peer configuration is presented below. Note that not all values for the server peer's attributes are specified in the example

```
    <!-- ServerPeer MBean configuration
         ============================== -->
    <mbean code="org.jboss.jms.server.ServerPeer"
     name="jboss.messaging:service=ServerPeer"
     xmbean-dd="xmdesc/ServerPeer-xmbean.xml">

     <!-- The unique id of the server peer - in a cluster each node MUST have a unique value
- must be an integer -->

     <attribute name="ServerPeerID">0</attribute>

     <!-- The default JNDI context to use for queues when they are deployed without
specifying one -->

     <attribute name="DefaultQueueJNDIContext">/queue</attribute>

     <!-- The default JNDI context to use for topics when they are deployed without
specifying one -->

     <attribute name="DefaultTopicJNDIContext">/topic</attribute>

  <attribute name="PostOffice">jboss.messaging:service=PostOffice</attribute>

     <!-- The default Dead Letter Queue (DLQ) to use for destinations.
          This can be overridden on a per destinatin basis -->

     <attribute name="DefaultDLQ">
       jboss.messaging.destination:service=Queue,name=DLQ
     </attribute>

     <!-- The default maximum number of times to attempt delivery of a message before sending
to the DLQ (if configured).
          This can be overridden on a per destination basis -->

     <attribute name="DefaultMaxDeliveryAttempts">10</attribute>

     <!-- The default Expiry Queue to use for destinations. This can be overridden on a per
destinatin basis -->

     <attribute name="DefaultExpiryQueue">
       jboss.messaging.destination:service=Queue,name=ExpiryQueue
     </attribute>

     <!-- The default redelivery delay to impose. This can be overridden on a per destination
basis -->
```

```
     <attribute name="DefaultRedeliveryDelay">0</attribute>

     <!-- The periodicity of the message counter manager enquiring on queues for statistics
 -->

     <attribute name="MessageCounterSamplePeriod">5000</attribute>

     <!-- The maximum amount of time for a client to wait for failover to start on the server
 side after
          it has detected failure -->

     <attribute name="FailoverStartTimeout">60000</attribute>

     <!-- The maximum amount of time for a client to wait for failover to complete on the
 server side after
          it has detected failure -->

     <attribute name="FailoverCompleteTimeout">300000</attribute>

     <!-- The maximum number of days results to maintain in the message counter history -->

     <attribute name="DefaultMessageCounterHistoryDayLimit">-1</attribute>

     <!-- The name of the connection factory to use for creating connections between nodes to
 pull messages -->

     <attribute name="ClusterPullConnectionFactoryName">
       jboss.messaging.connectionfactory:service=ClusterPullConnectionFactory
     </attribute>

     <!-- When redistributing messages in the cluster. Do we need to preserve the order of
 messages received
           by a particular consumer from a particular producer? -->

     <attribute name="DefaultPreserveOrdering">false</attribute>

     <!-- Max. time to hold previously delivered messages back waiting for clients to
 reconnect after failover -->

     <attribute name="RecoverDeliveriesTimeout">300000</attribute>

     <attribute name="EnableMessageCounters">false</attribute>


     <!-- The password used by the message sucker connections to create connections.
          THIS SHOULD ALWAYS BE CHANGED AT INSTALL TIME TO SECURE SYSTEM
     <attribute name="SuckerPassword"></attribute>
     -->

     <depends optional-attribute-
name="PersistenceManager">jboss.messaging:service=PersistenceManager</depends>

     <depends optional-attribute-
name="JMSUserManager">jboss.messaging:service=JMSUserManager</depends>

     <depends>jboss.messaging:service=Connector,transport=bisocket</depends>
     <depends optional-attribute-name="SecurityStore" proxy-
type="org.jboss.jms.server.SecurityStore">jboss.messaging:service=SecurityStore</depends>

   </mbean>
```

3.2.1. ServerPeer attributes

We now discuss the MBean attributes of the ServerPeer MBean.

ServerPeerID

The unique id of the server peer. Every node you deploy MUST have a unique id. This applies whether the different nodes form a cluster, or are only linked via a message bridge. The id must be a valid integer between 0 and 1023.

DefaultQueueJNDIContext

The default JNDI context to use when binding queues. Defaults to /queue.

DefaultTopicJNDIContext

The default JNDI context to use when binding topics.wa Defaults to /topic.

PostOffice

This is the post office that the ServerPeer uses. You will not normally need to change this attribute. The post office is responsible for routing messages to queues and maintaining the mapping between addresses and queues.

DefaultDLQ

This is the name of the default DLQ (Dead Letter Queue) the server peer will use for destinations. The DLQ can be overridden on a per destination basis - see the destination MBean configuration for more details. A DLQ is a special destination where messages are sent when the server has attempted to deliver them unsuccessfully more than a certain number of times. If the DLQ is not specified at all then the message will be removed after the maximum number of delivery attempts. The maximum number of delivery attempts can be specified using the attribute DefaultMaxDeliveryAttempts for a global default or individually on a per destination basis.

Important

Message-Driven Bean (MDB) and JBoss Messaging (JBM) both have individual DLQ logic. You will want to be careful which one is processing your undelivered messages as a situation may occur where a process is expecting MDB DLQ logic to be used however in reality JBM DLQ logic has been given precedence and thus an error may occur.

DefaultMaxDeliveryAttempts

The default for the maximum number of times delivery of a message will be attempted before sending the message to the DLQ, if configured.

The default value is **`10`**.

This value can also be overridden on a per destination basis.

DefaultExpiryQueue

This is the name of the default expiry queue the server peer will use for destinations. The expiry can be overridden on a per destination basis - see the destination MBean configuration for more details.

An expiry queue is a special destination where messages are sent when they have expired. Message expiry is determined by the value of Message::getJMSExpiration() If the expiry queue is not specified at all then the message will be removed after it is expired.

DefaultRedeliveryDelay

When redelivering a message after failure of previous delivery it is often beneficial to introduce a delay perform redelivery in order to prevent thrashing of delivery-failure, delivery-failure etc

The default value is **`0`** which means there will be no delay.

Change this if your application could benefit with a delay before redelivery. This value can also be overridden on a per destination basis.

MessageCounterSamplePeriod

Periodically the server will query each queue to gets its statistics. This is the period.

The default value is **`10000`** milliseconds.

FailoverStartTimeout

The maximum number of milliseconds the client will wait for failover to start on the server side when a problem is detected.

The default value is **`60000`** (one minute).

FailoverCompleteTimeout

The maximum number of milliseconds the client will wait for failover to complete on the server side after it has started.

The default value is **`300000`** (five minutes).

DefaultMessageCounterHistoryDayLimit

JBoss Messaging provides a message counter history which shows the number of messages arriving on each queue of a certain number of days. This attribute represents the maximum number of days for which to store message counter history. It can be overridden on a per destination basis.

ClusterPullConnectionFactory

The name of the connection factory to use for pulling messages between nodes.

If you wish to turn off message sucking between queues altogether, but retain failover, then you can omit this attribute altogether

DefaultPreserveOrdering

If true, then strict JMS ordering is preserved in the cluster. See the cluster configurations section for more details. Default is false.

RecoverDeliveriesTimeout

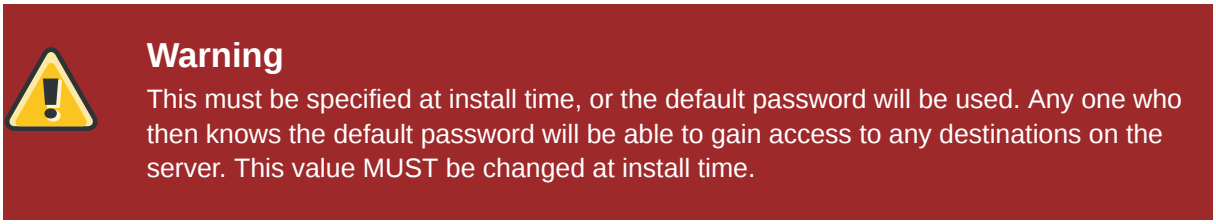
When failover occurs, already delivered messages will be kept aside, waiting for clients to reconnect. In the case that clients never reconnect (e.g. the client is dead) then eventually these messages will timeout and be added back to the queue. The value is in ms. The default is 5 mins.

EnableMessageCounters

Set this to true to enable message counters when the server starts

SuckerPassword

JBoss Messaging internally makes connections between nodes in order to redistribute messages between clustered destinations. These connections are made with the user name of a special reserved user. On this parameter you define the password used as these connections are made. After JBossMessaging 1.4.1.GA you will need to define the Sucker Password on the ServerPeer and on the SecurityMetadataStore.



SuckerConnectionRetryTimes

Maximum times for a sucker's connection to retry in case of failure. Default is -1 (retry forever)

SuckerConnectionRetryInterval

The interval in milliseconds between each retry of the failed sucker's connection. Default is 5000.

StrictTCK

Set to true if you want strict JMS TCK semantics

Destinations

Returns a list of the destinations (queues and topics) currently deployed.

MessageCounters

JBoss Messaging provides a message counter for each queue.

MessageCountersStatistics

JBoss Messaging provides statistics for each message counter for each queue.

SupportsFailover

Set to false to prevent server side failover occurring in a cluster when a node crashes.

PersistenceManager
This is the persistence manager that the ServerPeer uses. You will not normally need to change this attribute.

JMSUserManager
This is the JMS user manager that the ServerPeer uses. You will not normally need to change this attribute.

SecurityStore
This is the pluggable SecurityStore. If you redefine this SecurityStore, notice it will need to authenticate the MessageSucker user ("JBM.SUCKER") with all the special permissions required by clustering.

SupportsTxAge
Controls whether to store transaction creation time. If set to true, transaction creation time will be stored in the transaction record. If set to false, transaction creation time won't be recorded. Default is false.

3.2.2. We now discuss the MBean operations of the ServerPeer MBean.

DeployQueue
This operation lets you programmatically deploy a queue.

There are two overloaded versions of this operation

If the queue already exists but is undeployed it is deployed. Otherwise it is created and deployed.

The **`name`** parameter represents the name of the destination to deploy.

The **`jndiName`** parameter (optional) represents the full jndi name where to bind the destination. If this is not specified then the destination will be bound in <DefaultQueueJNDIContext>/<name>.

The first version of this operation deploys the destination with the default paging parameters. The second overloaded version deploys the destination with the specified paging parameters. See the section on configuring destinations for a discussion of what the paging parameters mean.

UndeployQueue
This operation lets you programmatically undeploy a queue.

The queue is undeployed but is NOT removed from persistent storage.

This operation returns **`true`** if the queue was successful undeployed. otherwise it returns **`false`**.

DestroyQueue
This operation lets you programmatically destroy a queue.

The queue is undeployed and then all its data is destroyed from the database.

Warning

Be careful when using this method since it will delete all data for the queue.

This operation returns **`true`** if the queue was successfully destroyed. otherwise it returns **`false`**.

DeployTopic

This operation lets you programmatically deploy a topic.

There are two overloaded versions of this operation.

If the topic already exists but is undeployed it is deployed. Otherwise it is created and deployed.

The **`name`** parameter represents the name of the destination to deploy.

The **`jndiName`** parameter (optional) represents the full jndi name where to bind the destination. If this is not specified then the destination will be bound in <DefaultTopicJNDIContext>/<name>.

The first version of this operation deploys the destination with the default paging parameters. The second overloaded version deploys the destination with the specified paging parameters. See the section on configuring destinations for a discussion of what the paging parameters mean.

UndeployTopic

This operation lets you programmatically undeploy a topic.

The queue is undeployed but is NOT removed from persistent storage.

This operation returns **`true`** if the topic was successfully undeployed. otherwise it returns **`false`**.

DestroyTopic

This operation lets you programmatically destroy a topic.

The topic is undeployed and then all its data is destroyed from the database.

Warning

Be careful when using this method since it will delete all data for the topic.

This operation returns **`true`** if the topic was successfully destroyed. otherwise it returns **`false`**.

ListMessageCountersHTML

This operation returns message counters in an easy to display HTML format.

ResetAllMesageCounters

This operation resets all message counters to zero.

ResetAllMesageCounters
This operation resets all message counter histories to zero.

EnableMessageCounters
This operation enables all message counters for all destinations. Message counters are disabled by default.

DisableMessageCounters
This operation disables all message counters for all destinations. Message counters are disabled by default.

RetrievePreparedTransactions
Retrieves a list of the Xids for all transactions currently in a prepared state on the node.

ShowPreparedTransactions
Retrieves a list of the Xids for all transactions currently in a prepared state on the node in an easy to display HTML format.

3.2.3. ListAllPreparedTransactions
Display the details of all prepared transactions

3.2.4. ListPreparedTransactions
Display the details of all prepared transactions whose ages are equal to or older than a certain time.

3.2.5. ShowMessageDetails
Display the details of a message. It takes message id as its parameter.

3.2.6. CommitPreparedTransaction
Manually commit a prepared transaction. It takes transaction id as its parameter.

3.2.7. RollbackPreparedTransaction
Manually roll back a prepared transaction. It takes transaction id as its parameter.

3.3. Changing the Database
Several JBoss Messaging services interact with persistent storage. They include: The Persistence Manager, The PostOffice and the JMS User Manager. The Persistence Manager is used to handle the message-related persistence. The Post Office handles binding related persistence. The JMS User manager handles user related persistence The configuration for all these MBeans is handled in the **`xxx-persistence-service.xml`** file.

If the database you want to switch to is one of MySQL, Oracle, PostgreSQL, MS SQL Sever or Sybase, persistence configuration files are already available in the **`jboss-as/docs/examples/jms`** directory of the release bundle.

In order to enable support for one of these databases, just replace the default **`hsqldb-persistence-service.xml`** configuration file with the database-specific configuration file and restart the server.

Also, be aware that by default, the Messaging services relying on a datastore are referencing **`"java:/DefaultDS"`** for the datasource. If you are deploying a datasource with a different JNDI name, you need to update all the **`DataSource`** attribute in the persistence configuration file. Example data source configurations for each of the popular databases are available in the distribution.

3.4. Configuring the Post office

It is the job of the post office to route messages to their destination(s).

The post office maintains the mappings between addresses to which messages can be sent and their final queues.

For example when sending a message with an address that represents a JMS queue name, the post office will route this to a single queue - the JMS queue. When sending a message with an address that represents a JMS topic name, the post office will route this to a set of queues - one for each JMS subscription.

The post office also handles the persistence for the mapping of addresses.

JBoss Messaging post-offices are also cluster aware. In a cluster they will automatically route and pull messages between them in order to provide fully distributed JMS queues and topics.

The post office configuration is found in the xxx-persistence-service.xml file (where xxx is the name of your database).

Here is an example of a post office configuration:

```
   <mbean code="org.jboss.messaging.core.jmx.MessagingPostOfficeService"
      name="jboss.messaging:service=PostOffice"
      xmbean-dd="xmdesc/MessagingPostOffice-xmbean.xml">

      <depends optional-attribute-name="ServerPeer">jboss.messaging:service=ServerPeer</
depends>

      <depends>jboss.jca:service=DataSourceBinding,name=DefaultDS</depends>

      <depends optional-attribute-name="TransactionManager">jboss:service=TransactionManager</
depends>

      <!-- The name of the post office -->

      <attribute name="PostOfficeName">JMS post office</attribute>

      <!-- The datasource used by the post office to access it's binding information -->


      <attribute name="DataSource">java:/DefaultDS</attribute>

      <!-- If true will attempt to create tables and indexes on every start-up -->

      <attribute name="CreateTablesOnStartup">true</attribute>


      <!-- If true then we will automatically detect and reject duplicate messages sent during
 failover -->
```

```
     <attribute name="DetectDuplicates">true</attribute>

     <!-- The size of the id cache to use when detecting duplicate messages -->

     <attribute name="IDCacheSize">500</attribute>


     <attribute name="SqlProperties"><![CDATA[
CREATE_POSTOFFICE_TABLE=CREATE TABLE JBM_POSTOFFICE (POSTOFFICE_NAME VARCHAR(255), NODE_ID
 INTEGER, QUEUE_NAME VARCHAR(255), COND VARCHAR(1023), SELECTOR VARCHAR(1023), CHANNEL_ID
 BIGINT, CLUSTERED CHAR(1), ALL_NODES CHAR(1), PRIMARY KEY(POSTOFFICE_NAME, NODE_ID,
 QUEUE_NAME)) ENGINE = INNODB
INSERT_BINDING=INSERT INTO JBM_POSTOFFICE (POSTOFFICE_NAME, NODE_ID, QUEUE_NAME, COND,
 SELECTOR, CHANNEL_ID, CLUSTERED, ALL_NODES) VALUES (?, ?, ?, ?, ?, ?, ?, ?)
DELETE_BINDING=DELETE FROM JBM_POSTOFFICE WHERE POSTOFFICE_NAME=? AND NODE_ID=? AND
 QUEUE_NAME=?
LOAD_BINDINGS=SELECT QUEUE_NAME, COND, SELECTOR, CHANNEL_ID, CLUSTERED, ALL_NODES FROM
 JBM_POSTOFFICE WHERE POSTOFFICE_NAME=? AND NODE_ID=?
     ]]></attribute>

     <!-- This post office is clustered. If you don't want a clustered post office then set
 to false -->

     <attribute name="Clustered">true</attribute>

     <!-- All the remaining properties only have to be specified if the post office is
 clustered.
          You can safely comment them out if your post office is non clustered -->

     <!-- The JGroups group name that the post office will use -->

     <attribute name="GroupName">${jboss.messaging.groupname:MessagingPostOffice}</attribute>

     <!-- Max time to wait for state to arrive when the post office joins the cluster -->


     <attribute name="StateTimeout">5000</attribute>

     <!-- Max time to wait for a synchronous call to node members using the MessageDispatcher
 -->

     <attribute name="CastTimeout">50000</attribute>

     <!-- Set this to true if you want failover of connections to occur when a node is shut
 down -->

     <attribute name="FailoverOnNodeLeave">false</attribute>


     <!-- JGroups stack configuration for the data channel - used for sending data across the
 cluster -->

     <!-- By default we use the TCP stack for data -->
     <attribute name="DataChannelConfig">
        <config>
           <TCP start_port="7900"
                loopback="true"
                recv_buf_size="20000000"
                send_buf_size="640000"
                discard_incompatible_packets="true"
                max_bundle_size="64000"
                max_bundle_timeout="30"
                use_incoming_packet_handler="true"
```

```
                use_outgoing_packet_handler="false"
                down_thread="false" up_thread="false"
                enable_bundling="false"
                use_send_queues="false"
                sock_conn_timeout="300"
                skip_suspected_members="true"/>
            <MPING timeout="4000"
           bind_to_all_interfaces="true"
           mcast_addr="${jboss.messaging.datachanneludpaddress:228.6.6.6}"
           mcast_port="${jboss.messaging.datachanneludpport:45567}"
           ip_ttl="8"
           num_initial_members="2"
           num_ping_requests="1"/>
            <MERGE2 max_interval="100000"
                    down_thread="false" up_thread="false" min_interval="20000"/>
            <FD_SOCK down_thread="false" up_thread="false"/>
            <VERIFY_SUSPECT timeout="1500" down_thread="false" up_thread="false"/>
            <pbcast.NAKACK max_xmit_size="60000"
                           use_mcast_xmit="false" gc_lag="0"
                           retransmit_timeout="300,600,1200,2400,4800"
                           down_thread="false" up_thread="false"
                           discard_delivered_msgs="true"/>
            <pbcast.STABLE stability_delay="1000" desired_avg_gossip="50000"
                           down_thread="false" up_thread="false"
                           max_bytes="400000"/>
            <pbcast.GMS print_local_addr="true" join_timeout="3000"
                        down_thread="false" up_thread="false"
                        join_retry_timeout="2000" shun="false"
                        view_bundling="true"/>
      </config>
    </attribute>

    <!-- JGroups stack configuration to use for the control channel - used for control
messages -->

    <!-- We use udp stack for the control channel -->
    <attribute name="ControlChannelConfig">
       <config>
          <UDP
                mcast_addr="${jboss.messaging.controlchanneludpaddress:228.7.7.7}"
                mcast_port="${jboss.messaging.controlchanneludpport:45568}"
                tos="8"
                ucast_recv_buf_size="20000000"
                ucast_send_buf_size="640000"
                mcast_recv_buf_size="25000000"
                mcast_send_buf_size="640000"
                loopback="false"
                discard_incompatible_packets="true"
                max_bundle_size="64000"
                max_bundle_timeout="30"
                use_incoming_packet_handler="true"
                use_outgoing_packet_handler="false"
                ip_ttl="2"
                down_thread="false" up_thread="false"
                enable_bundling="false"/>
          <PING timeout="2000"
                down_thread="false" up_thread="false" num_initial_members="3"/>
          <MERGE2 max_interval="100000"
                  down_thread="false" up_thread="false" min_interval="20000"/>
          <FD_SOCK down_thread="false" up_thread="false"/>
          <FD timeout="10000" max_tries="5" down_thread="false" up_thread="false"
shun="true"/>
          <VERIFY_SUSPECT timeout="1500" down_thread="false" up_thread="false"/>
          <pbcast.NAKACK max_xmit_size="60000"
```

```
                           use_mcast_xmit="false" gc_lag="0"
                           retransmit_timeout="300,600,1200,2400,4800"
                           down_thread="false" up_thread="false"
                           discard_delivered_msgs="true"/>
            <UNICAST timeout="300,600,1200,2400,3600"
                     down_thread="false" up_thread="false"/>
            <pbcast.STABLE stability_delay="1000" desired_avg_gossip="50000"
                           down_thread="false" up_thread="false"
                           max_bytes="400000"/>
            <pbcast.GMS print_local_addr="true" join_timeout="3000" use_flush="true"
flush_timeout="3000"
                        down_thread="false" up_thread="false"
                        join_retry_timeout="2000" shun="false"
                        view_bundling="true"/>
            <FRAG2 frag_size="60000" down_thread="false" up_thread="false"/>
            <pbcast.STATE_TRANSFER down_thread="false" up_thread="false" use_flush="true"
flush_timeout="3000"/>
            <pbcast.FLUSH down_thread="false" up_thread="false" timeout="20000"
auto_flush_conf="false"/>
       </config>
    </attribute>

  </mbean>
```

3.4.1. The post office has the following attributes

DataSource

The datasource the postoffice should use for persisting its mapping data.

SQLProperties

This is where the DDL and DML for the particular database is specified. If a particular DDL or DML statement is not overridden, the default Hypersonic configuration will be used for that statement.

CreateTablesOnStartup

Set this to **`true`** if you wish the post office to attempt to create the tables (and indexes) when it starts. If the tables (or indexes) already exist a **`SQLException`** will be thrown by the JDBC driver and ignored by the Persistence Manager, allowing it to continue.

By default the value of **`CreateTablesOnStartup`** attribute is set to **`true`**

DetectDuplicates

Set this to **`true`** if you wish the post office detect duplicate messages that may sent when a send is retried on a different node after server failure.

By default the value of **`DetectDuplicates`** attribute is set to **`true`**

IDCacheSize

If duplicate detection is enabled. (See **`DetectDuplicates`**), then the server will remember the last **n** message ids sent, to prevent duplicate messages sent after failover has occurred. The value of **n** is determined by this attribute.

By default the value of **`IDCacheSize`** attribute is set to **`500`**

PostOfficeName
The name of the post office.

NodeIDView
This returns set containing the node ids of all the nodes in the cluster.

GroupName
All post offices in the cluster with the same group name will form a cluster together. Make sure the group name matches with all the nodes in the cluster you want to form a cluster with.

Clustered
If true the post office will take part in a cluster to form distributed queues and topics. If false then it will not participate in the cluster. If false, then all the cluster related attributes will be ignored.

StateTimeout
The maximum time to wait when waiting for the group state to arrive when a node joins a pre-existing cluster.

The default value is **`5000`** milliseconds.

CastTimeout
The maximum time to wait for a reply casting message synchronously.

The default value is **`5000`** milliseconds.

FailoverOnNodeLeave
If this attribute is **`true`** then if a server node is shut down cleanly, then this will cause any connections on the shutting down node to failover onto another node.

The default value for this is attribute is **`false`**

MaxConcurrentReplications
The maximum number of concurrent replication requests to make before blocking for replies to come back. This prevents us overwhelming JGroups. This is rarely a good reason to change this.

The default value is **`50`**

ControlChannelConfig
JBoss Messaging uses JGroups for all group management. This contains the JGroups stack configuration for the control channel.

The control channel is used for sending request/receiving responses from other nodes in the cluster

The details of the JGroups configuration won't be discussed here since it is standard JGroups configuration. Detailed information on JGroups can be found in JGroups release documentation or online at *http://www.jgroups.org* or *http://wiki.jboss.org/wiki/Wiki.jsp?page=JGroups*.

DataChannelConfig

JBoss Messaging uses JGroups for all group management. This contains the JGroups stack configuration for the data channel.

The data channel is used for sending sending/receiving messages from other nodes in the cluster and for replicating session data.

The details of the JGroups configuration won't be discussed here since it is standard JGroups configuration. Detailed information on JGroups can be found in JGroups release documentation or online at *http://www.jgroups.org* or *http://wiki.jboss.org/wiki/Wiki.jsp?page=JGroups*.

3.5. Configuring the Persistence Manager

It is the job of the persistence manager to manage all message related persistence.

JBoss Messaging ships with a JDBC Persistence Manager used for handling persistence of message data in a relational database accessed via JDBC. The Persistence Manager implementation is pluggable (the Persistence Manager is a Messaging server plug-in), this making possible to provide other implementations for persisting message data in non relational stores, file stores etc.

The configuration of "persistent" services is grouped in a **`xxx-persistence-service.xml`** file, where xxx corresponds to the database name. By default, Messaging ships with a **`hsqldb-persistence-service.xml`**, which configures the Messaging server to use the in-VM Hypersonic database instance that comes by default with any JBossAS instance.

Warning

The default Persistence Manager configuration is works out of the box with Hypersonic, however it must be stressed that Hypersonic should not be used in a production environment mainly due to its limited support for transaction isolation and its propensity to behave erratically under high load.

The *Critique of Hypersonic*[1] wiki page outlines some of the well-known issues occurring when using this database.

JBoss Messaging also ships with pre-made Persistence Manager configurations for MySQL, Oracle, PostgreSQL, Sybase and MS SQL Server. The example **`mysql-persistence-service.xml`**, **`ndb-persistence-service.xml`**, **`oracle-persistence-service.xml`**, **`postgres-persistence-service.xml`**, **`sybase-persistence-service.xml`**, **`mssql-persistence-service.xml`** and **`db2-persistence-service.xml`** configuration files are available in the **`jboss-as/docs/examples/jms`** directory of the release bundle.

Users are encouraged to contribute their own configuration files where we will thoroughly test them before certifying them for supported use with JBoss Messaging. The JDBC Persistence Manager has been designed to use standard SQL for the DML so writing a JDBC Persistence Manager configuration for another database is usually only a fairly simple matter of changing DDL in the configuration which is likely to be different for different databases.

JBoss Messaging also ships with a Null Persistence Manager config - this can be used when you don't want any persistence at all.

The default Hypersonic persistence configuration file is listed below:

```
 <mbean code="org.jboss.messaging.core.jmx.JDBCPersistenceManagerService"
     name="jboss.messaging:service=PersistenceManager"
     xmbean-dd="xmdesc/JDBCPersistenceManager-xmbean.xml">

     <depends>jboss.jca:service=DataSourceBinding,name=DefaultDS</depends>

     <depends optional-attribute-name="TransactionManager">jboss:service=TransactionManager</
depends>

     <!-- The datasource to use for the persistence manager -->

     <attribute name="DataSource">java:/DefaultDS</attribute>

     <!-- If true will attempt to create tables and indexes on every start-up -->

     <attribute name="CreateTablesOnStartup">true</attribute>

     <!-- If true then will use JDBC batch updates -->

     <attribute name="UsingBatchUpdates">true</attribute>

     <attribute name="SqlProperties"><![CDATA[
  CREATE_DUAL=CREATE TABLE JBM_DUAL (DUMMY INTEGER, PRIMARY KEY (DUMMY)) ENGINE = INNODB
  CREATE_MESSAGE_REFERENCE=CREATE TABLE JBM_MSG_REF (CHANNEL_ID BIGINT, MESSAGE_ID BIGINT,
TRANSACTION_ID BIGINT, STATE CHAR(1), ORD BIGINT, PAGE_ORD BIGINT, DELIVERY_COUNT INTEGER,
SCHED_DELIVERY BIGINT, PRIMARY KEY(CHANNEL_ID, MESSAGE_ID)) ENGINE = INNODB
  CREATE_IDX_MESSAGE_REF_TX=CREATE INDEX JBM_MSG_REF_TX ON JBM_MSG_REF (TRANSACTION_ID)
  CREATE_IDX_MESSAGE_REF_ORD=CREATE INDEX JBM_MSG_REF_ORD ON JBM_MSG_REF (ORD)
  CREATE_IDX_MESSAGE_REF_PAGE_ORD=CREATE INDEX JBM_MSG_REF_PAGE_ORD ON JBM_MSG_REF (PAGE_ORD)
  CREATE_IDX_MESSAGE_REF_MESSAGE_ID=CREATE INDEX JBM_MSG_REF_MESSAGE_ID ON JBM_MSG_REF
(MESSAGE_ID)
  CREATE_IDX_MESSAGE_REF_SCHED_DELIVERY=CREATE INDEX JBM_MSG_REF_SCHED_DELIVERY ON
JBM_MSG_REF (SCHED_DELIVERY)
  CREATE_MESSAGE=CREATE TABLE JBM_MSG (MESSAGE_ID BIGINT, RELIABLE CHAR(1), EXPIRATION
BIGINT, TIMESTAMP BIGINT, PRIORITY TINYINT, TYPE TINYINT, HEADERS MEDIUMBLOB, PAYLOAD
LONGBLOB, PRIMARY KEY (MESSAGE_ID)) ENGINE = INNODB
  CREATE_IDX_MESSAGE_TIMESTAMP=CREATE INDEX JBM_MSG_REF_TIMESTAMP ON JBM_MSG (TIMESTAMP)
  CREATE_TRANSACTION=CREATE TABLE JBM_TX (NODE_ID INTEGER, TRANSACTION_ID BIGINT, BRANCH_QUAL
VARBINARY(254), FORMAT_ID INTEGER, GLOBAL_TXID VARBINARY(254), PRIMARY KEY (TRANSACTION_ID))
ENGINE = INNODB
  CREATE_COUNTER=CREATE TABLE JBM_COUNTER (NAME VARCHAR(255), NEXT_ID BIGINT, PRIMARY
KEY(NAME)) ENGINE = INNODB
  INSERT_DUAL=INSERT INTO JBM_DUAL VALUES (1)
  CHECK_DUAL=SELECT 1 FROM JBM_DUAL
  INSERT_MESSAGE_REF=INSERT INTO JBM_MSG_REF (CHANNEL_ID, MESSAGE_ID, TRANSACTION_ID, STATE,
ORD, PAGE_ORD, DELIVERY_COUNT, SCHED_DELIVERY) VALUES (?, ?, ?, ?, ?, ?, ?, ?)
  DELETE_MESSAGE_REF=DELETE FROM JBM_MSG_REF WHERE MESSAGE_ID=? AND CHANNEL_ID=? AND
STATE='C'
  UPDATE_MESSAGE_REF=UPDATE JBM_MSG_REF SET TRANSACTION_ID=?, STATE='-' WHERE MESSAGE_ID=?
AND CHANNEL_ID=? AND STATE='C'
  UPDATE_PAGE_ORDER=UPDATE JBM_MSG_REF SET PAGE_ORD = ? WHERE MESSAGE_ID=? AND CHANNEL_ID=?
  COMMIT_MESSAGE_REF1=UPDATE JBM_MSG_REF SET STATE='C', TRANSACTION_ID = NULL WHERE
TRANSACTION_ID=? AND STATE='+'
  COMMIT_MESSAGE_REF2=DELETE FROM JBM_MSG_REF WHERE TRANSACTION_ID=? AND STATE='-'
  ROLLBACK_MESSAGE_REF1=DELETE FROM JBM_MSG_REF WHERE TRANSACTION_ID=? AND STATE='+'
  ROLLBACK_MESSAGE_REF2=UPDATE JBM_MSG_REF SET STATE='C', TRANSACTION_ID = NULL WHERE
TRANSACTION_ID=? AND STATE='-'
```

```
  LOAD_PAGED_REFS=SELECT MESSAGE_ID, DELIVERY_COUNT, PAGE_ORD, SCHED_DELIVERY FROM
JBM_MSG_REF WHERE CHANNEL_ID = ? AND PAGE_ORD BETWEEN ? AND ? ORDER BY PAGE_ORD
  LOAD_UNPAGED_REFS=SELECT MESSAGE_ID, DELIVERY_COUNT, SCHED_DELIVERY FROM JBM_MSG_REF WHERE
STATE = 'C' AND CHANNEL_ID = ? AND PAGE_ORD IS NULL ORDER BY ORD
  LOAD_REFS=SELECT MESSAGE_ID, DELIVERY_COUNT, SCHED_DELIVERY FROM JBM_MSG_REF WHERE STATE =
'C' AND CHANNEL_ID = ? ORDER BY ORD
  UPDATE_REFS_NOT_PAGED=UPDATE JBM_MSG_REF SET PAGE_ORD = NULL WHERE PAGE_ORD BETWEEN ? AND ?
AND CHANNEL_ID=?
  SELECT_MIN_MAX_PAGE_ORD=SELECT MIN(PAGE_ORD), MAX(PAGE_ORD) FROM JBM_MSG_REF WHERE
CHANNEL_ID = ?
  SELECT_EXISTS_REF_MESSAGE_ID=SELECT MESSAGE_ID FROM JBM_MSG_REF WHERE MESSAGE_ID = ?
  UPDATE_DELIVERY_COUNT=UPDATE JBM_MSG_REF SET DELIVERY_COUNT = ? WHERE CHANNEL_ID = ? AND
MESSAGE_ID = ?
  UPDATE_CHANNEL_ID=UPDATE JBM_MSG_REF SET CHANNEL_ID = ? WHERE CHANNEL_ID = ?
  LOAD_MESSAGES=SELECT MESSAGE_ID, RELIABLE, EXPIRATION, TIMESTAMP, PRIORITY, HEADERS,
PAYLOAD, TYPE FROM JBM_MSG
  INSERT_MESSAGE=INSERT INTO JBM_MSG (MESSAGE_ID, RELIABLE, EXPIRATION, TIMESTAMP, PRIORITY,
TYPE, HEADERS, PAYLOAD) VALUES (?, ?, ?, ?, ?, ?, ?, ?)
  INSERT_MESSAGE_CONDITIONAL=INSERT INTO JBM_MSG (MESSAGE_ID, RELIABLE, EXPIRATION,
TIMESTAMP, PRIORITY, TYPE, INST_TIME) SELECT ?, ?, ?, ?, ?, ?, ? FROM JBM_DUAL WHERE NOT
EXISTS (SELECT MESSAGE_ID FROM JBM_MSG WHERE MESSAGE_ID = ?)
  UPDATE_MESSAGE_4CONDITIONAL=UPDATE JBM_MSG SET HEADERS=?, PAYLOAD=? WHERE MESSAGE_ID=?
  INSERT_MESSAGE_CONDITIONAL_FULL=INSERT INTO JBM_MSG (MESSAGE_ID, RELIABLE, EXPIRATION,
TIMESTAMP, PRIORITY, TYPE, HEADERS, PAYLOAD) SELECT ?, ?, ?, ?, ?, ?, ?, ? FROM JBM_DUAL
WHERE NOT EXISTS (SELECT MESSAGE_ID FROM JBM_MSG WHERE MESSAGE_ID = ?)
  MESSAGE_ID_COLUMN=MESSAGE_ID
  DELETE_MESSAGE=DELETE FROM JBM_MSG WHERE MESSAGE_ID = ? AND NOT EXISTS (SELECT * FROM
JBM_MSG_REF WHERE JBM_MSG_REF.MESSAGE_ID = ?)
  INSERT_TRANSACTION=INSERT INTO JBM_TX (NODE_ID, TRANSACTION_ID, BRANCH_QUAL, FORMAT_ID,
GLOBAL_TXID) VALUES(?, ?, ?, ?, ?)
  DELETE_TRANSACTION=DELETE FROM JBM_TX WHERE NODE_ID = ? AND TRANSACTION_ID = ?
  SELECT_PREPARED_TRANSACTIONS=SELECT TRANSACTION_ID, BRANCH_QUAL, FORMAT_ID, GLOBAL_TXID
FROM JBM_TX WHERE NODE_ID = ?
  SELECT_MESSAGE_ID_FOR_REF=SELECT MESSAGE_ID, CHANNEL_ID FROM JBM_MSG_REF WHERE
TRANSACTION_ID = ? AND STATE = '+' ORDER BY ORD
  SELECT_MESSAGE_ID_FOR_ACK=SELECT MESSAGE_ID, CHANNEL_ID FROM JBM_MSG_REF WHERE
TRANSACTION_ID = ? AND STATE = '-' ORDER BY ORD
  UPDATE_COUNTER=UPDATE JBM_COUNTER SET NEXT_ID = ? WHERE NAME=?
  SELECT_COUNTER=SELECT NEXT_ID FROM JBM_COUNTER WHERE NAME=? FOR UPDATE
  INSERT_COUNTER=INSERT INTO JBM_COUNTER (NAME, NEXT_ID) VALUES (?, ?)
  SELECT_ALL_CHANNELS=SELECT DISTINCT(CHANNEL_ID) FROM JBM_MSG_REF
  UPDATE_TX=UPDATE JBM_TX SET NODE_ID=? WHERE NODE_ID=?
     ]]></attribute>

     <!-- The maximum number of parameters to include in a prepared statement -->

     <attribute name="MaxParams">500</attribute>

     <attribute name="UseNDBFailoverStrategy">true</attribute>

  </mbean>
```

3.5.1. Important notes for Sybase and Microsoft SQL Server users

When a database is created in Sybase the maximum size of text and image datatypes is set to the default page size of 2 KB. Any longer message payload is truncated without any information or warning. The database parameters have to be updated to set the @@TEXTSIZE parameter to a higher value. The truncation behavior may also be observed in MSSQL Server if @@TEXTSIZE is changed from its default value to a smaller one. Further information: *http://jira.jboss.com/jira/browse/SOA-554*.

Sybase database may fail to insert a row if the total size of the row exceeds the page size allocated for the database. A command line option passed to the dataserver command used to start the database can be used to change the page size. Further information: *http://jira.jboss.com/jira/browse/SOA-553*

Microsoft SQL Server does not automatically de-allocate the hard-drive space occupied by data in a database when that data is deleted. If used as a data-store for services that temporarily store many records, such as a messaging service, the disk space used will grow to be much greater than the amount of data actually being stored. Your database administrator should implement database maintenance plans to ensure that unused space is reclaimed. Please refer to your Microsoft SQL Server documentation for the DBCC commands ShrinkDatabase and UpdateUsage for guidance. *https://jira.jboss.org/jira/browse/SOA-629*

3.5.2. We now discuss the MBean attributes of the PersistenceManager MBean

CreateTablesOnStartup

Set this to **`true`** if you wish the Persistence Manager to attempt to create the tables (and indexes) when it starts. If the tables (or indexes) already exist a **`SQLException`** will be thrown by the JDBC driver and ignored by the Persistence Manager, allowing it to continue.

By default the value of **`CreateTablesOnStartup`** attribute is set to **`true`**

UsingBatchUpdates

Set this to **`true`** if the database supports JDBC batch updates. The JDBC Persistence Manager will then group multiple database updates in batches to aid performance.

By default the value of **`UsingBatchUpdates`** attribute is set to **`false`**

UsingBinaryStream

Set this to **`true`** if you want messages to be store and read using a JDBC binary stream rather than using getBytes(), setBytes(). Some database has limits on the maximum number of bytes that can be get/set using getBytes()/setBytes().

By default the value of **`UsingBinaryStream`** attribute is set to **`true`**

UsingTrailingByte

Certain version of Sybase are known to truncate blobs if they have trailing zeros. To prevent this if this attribute is set to **`true`** then a trailing non zero byte will be added and removed to each blob before and after persistence to prevent the database from truncating it. Currently this is only known to be necessary for Sybase.

By default the value of **`UsingTrailingByte`** attribute is set to **`false`**

SupportsBlobOnSelect

Oracle (and possibly other databases) is known to not allow BLOBs to be inserted using a INSERT INTO ... SELECT FROM statement, and requires a two stage conditional insert of messages. If this value is false then such a two stage insert will be used.

By default the value of **`SupportsBlobOnSelect`** attribute is set to **`true`**

SQLProperties

This is where the DDL and DML for the particular database is specified. If a particular DDL or DML statement is not overridden, the default Hypersonic configuration will be used for that statement.

MaxParams

When loading messages the persistence manager will generate prepared statements with many parameters. This value tells the persistence manager what the absolute maximum number of parameters are allowable per prepared statement.

By default the value of **`MaxParams`** attribute is set to **`100`**

UseNDBFailoverStrategy

When running in a clustered database environment it is possible that some databases, MySQL for instance, can fail during the commit of a database transaction. This can happen if the database node dies whilst committing meaning that the final state of the transaction is unknown. If this attribute is set to true and the above happens then the SQL statement will be re-executed, however if there is a further error an assumption is made that this is because the previous transaction committed successfully and the error is ignored.

By default the value of **`UseNDBFailoverStrategy`** attribute is set to **`false`**

3.6. Configuring the JMS user manager

The JMS user manager handles the mapping of pre-configured client IDs to users and also managers the user and role tables which may or may not be used depending on which login module you have configured

Here is an example JMSUserManager configuration

```
<mbean code="org.jboss.jms.server.plugin.JDBCJMSUserManagerService"
   name="jboss.messaging:service=JMSUserManager"
   xmbean-dd="xmdesc/JMSUserManager-xmbean.xml">
   <depends>jboss.jca:service=DataSourceBinding,name=DefaultDS</depends>
   <depends optional-attribute-name="TransactionManager">
            jboss:service=TransactionManager
   </depends>
   <attribute name="DataSource">java:/DefaultDS</attribute>
   <attribute name="CreateTablesOnStartup">true</attribute>
   <attribute name="SqlProperties"><![CDATA[
            CREATE_USER_TABLE=CREATE TABLE JBM_USER (USER_ID VARCHAR(32) NOT NULL,
            PASSWD VARCHAR(32) NOT NULL, CLIENTID VARCHAR(128),
            PRIMARY KEY(USER_ID)) ENGINE = INNODB
            CREATE_ROLE_TABLE=CREATE TABLE JBM_ROLE (ROLE_ID VARCHAR(32) NOT NULL,
            USER_ID VARCHAR(32) NOT NULL, PRIMARY KEY(USER_ID, ROLE_ID))
            ENGINE = INNODB
            SELECT_PRECONF_CLIENTID=SELECT CLIENTID FROM JBM_USER WHERE USER_ID=?
            POPULATE.TABLES.1=INSERT INTO JBM_USER (USER_ID,PASSWD,CLIENTID)
            VALUES ('dilbert','dogbert','dilbert-id')
   ]]></attribute>
</mbean>
```

3.6.1. We now discuss the MBean attributes of the JMSUserManager MBean

CreateTablesOnStartup

Set this to **`true`** if you wish the JMS user manager to attempt to create the tables (and indexes) when it starts. If the tables (or indexes) already exist a **`SQLException`** will be thrown by the JDBC driver and ignored by the Persistence Manager, allowing it to continue.

By default the value of **`CreateTablesOnStartup`** attribute is set to **`true`**

UsingBatchUpdates

Set this to **`true`** if the database supports JDBC batch updates. The JDBC Persistence Manager will then group multiple database updates in batches to aid performance.

By default the value of **`UsingBatchUpdates`** attribute is set to **`false`**

SQLProperties

This is where the DDL and DML for the particular database is specified. If a particular DDL or DML statement is not overridden, the default Hypersonic configuration will be used for that statement.

Default user and role data can also be specified here. Any data to be inserted must be specified with property names starting with **`POPULATE.TABLES`** as in the above example.

3.7. Configuring Destinations

3.7.1. Pre-configured destinations

JBoss Messaging ships with a default set of pre-configured destinations that will be deployed during the server start up. The file that contains configuration for these destinations is **`destinations-service.xml`**. A section of this file is listed below:

```
<!--
   The Default Dead Letter Queue. This destination is a dependency of an EJB MDB container.
-->

<mbean code="org.jboss.jms.server.destination.QueueService"
   name="jboss.messaging.destination:service=Queue,name=DLQ"
   xmbean-dd="xmdesc/Queue-xmbean.xml">
   <depends optional-attribute-name="ServerPeer">
               jboss.messaging:service=ServerPeer
   </depends>
   <depends>jboss.messaging:service=PostOffice</depends>
</mbean>


<mbean code="org.jboss.jms.server.destination.TopicService"
   name="jboss.messaging.destination:service=Topic,name=testTopic"
   xmbean-dd="xmdesc/Topic-xmbean.xml">
   <depends optional-attribute-name="ServerPeer">
               jboss.messaging:service=ServerPeer
   </depends>
   <depends>jboss.messaging:service=PostOffice</depends>
```

```
   <attribute name="SecurityConfig">
      <security>
         <role name="guest" read="true" write="true"/>
         <role name="publisher" read="true" write="true" create="false"/>
         <role name="durpublisher" read="true" write="true" create="true"/>
      </security>
   </attribute>
</mbean>

<mbean code="org.jboss.jms.server.destination.TopicService"
   name="jboss.messaging.destination:service=Topic,name=securedTopic"
   xmbean-dd="xmdesc/Topic-xmbean.xml">
   <depends optional-attribute-name="ServerPeer">
               jboss.messaging:service=ServerPeer
   </depends>
   <depends>jboss.messaging:service=PostOffice</depends>
   <attribute name="SecurityConfig">
      <security>
         <role name="publisher" read="true" write="true" create="false"/>
      </security>
   </attribute>
</mbean>


<mbean code="org.jboss.jms.server.destination.QueueService"
   name="jboss.messaging.destination:service=Queue,name=testQueue"
   xmbean-dd="xmdesc/Queue-xmbean.xml">
   <depends optional-attribute-name="ServerPeer">
               jboss.messaging:service=ServerPeer
   </depends>
   <depends>jboss.messaging:service=PostOffice</depends>
   <attribute name="SecurityConfig">
      <security>
         <role name="guest" read="true" write="true"/>
         <role name="publisher" read="true" write="true" create="false"/>
         <role name="noacc" read="false" write="false" create="false"/>
      </security>
   </attribute>
</mbean>

<mbean code="org.jboss.jms.server.destination.QueueService"
   name="jboss.messaging.destination:service=Queue,name=A"
   xmbean-dd="xmdesc/Queue-xmbean.xml">
   <depends optional-attribute-name="ServerPeer">
               jboss.messaging:service=ServerPeer
   </depends>
   <depends>jboss.messaging:service=PostOffice</depends>
</mbean>


<!-- It's possible for indiviual queues and topics to use a specific queue for
an expiry or DLQ -->

<mbean code="org.jboss.jms.server.destination.QueueService"
   name="jboss.messaging.destination:service=Queue,name=PrivateDLQ"
   xmbean-dd="xmdesc/Queue-xmbean.xml">
   <depends optional-attribute-name="ServerPeer">
               jboss.messaging:service=ServerPeer
   </depends>
   <depends>jboss.messaging:service=PostOffice</depends>
</mbean>

<mbean code="org.jboss.jms.server.destination.QueueService"
   name="jboss.messaging.destination:service=Queue,name=PrivateExpiryQueue"
```

```
      xmbean-dd="xmdesc/Queue-xmbean.xml">
      <depends optional-attribute-name="ServerPeer">
                  jboss.messaging:service=ServerPeer
      </depends>
      <depends>jboss.messaging:service=PostOffice</depends>
   </mbean>

   <mbean code="org.jboss.jms.server.destination.QueueService"
      name="jboss.messaging.destination:service=Queue,name=QueueWithOwnDLQAndExpiryQueue"
      xmbean-dd="xmdesc/Queue-xmbean.xml">
      <depends optional-attribute-name="ServerPeer">
                  jboss.messaging:service=ServerPeer
      </depends>
      <depends>jboss.messaging:service=PostOffice</depends>
      <attribute name="DLQ">
                  jboss.messaging.destination:service=Queue,name=PrivateDLQ
      </attribute>
      <attribute name="ExpiryQueue">
                  jboss.messaging.destination:service=Queue,name=PrivateExpiryQueue
      </attribute>
   </mbean>

   <mbean code="org.jboss.jms.server.destination.TopicService"
      name="jboss.messaging.destination:service=Topic,name=TopicWithOwnDLQAndExpiryQueue"
      xmbean-dd="xmdesc/Topic-xmbean.xml">
      <depends optional-attribute-name="ServerPeer">
                  jboss.messaging:service=ServerPeer
      </depends>
      <depends>jboss.messaging:service=PostOffice</depends>
      <attribute name="DLQ">
                  jboss.messaging.destination:service=Queue,name=PrivateDLQ
      </attribute>
      <attribute name="ExpiryQueue">
                  jboss.messaging.destination:service=Queue,name=PrivateExpiryQueue
      </attribute>
   </mbean>


   <mbean code="org.jboss.jms.server.destination.TopicService"
      name="jboss.messaging.destination:service=Topic,name=TopicWithOwnRedeliveryDelay"
      xmbean-dd="xmdesc/Topic-xmbean.xml">
      <depends optional-attribute-name="ServerPeer">
                  jboss.messaging:service=ServerPeer
      </depends>
      <depends>jboss.messaging:service=PostOffice</depends>
      <attribute name="RedeliveryDelay">5000</attribute>
   </mbean>


   <mbean code="org.jboss.jms.server.destination.TopicService"
      name="jboss.messaging.destination:service=Topic,name=testDistributedTopic"
      xmbean-dd="xmdesc/Topic-xmbean.xml">
      <depends optional-attribute-name="ServerPeer">
                  jboss.messaging:service=ServerPeer
      </depends>
      <depends>jboss.messaging:service=PostOffice</depends>
      <attribute name="Clustered">true</attribute>
   </mbean>
....
```

3.8. Configuring queues

3.8.1. We now discuss the attributes of the Queue MBean

Name
The name of the queue

JNDIName
The JNDI name where the queue is bound

DLQ
The DLQ used for this queue. Overrides any value set on the ServerPeer config

ExpiryQueue
The Expiry queue used for this queue. Overrides any value set on the ServerPeer config

RedeliveryDelay
The redelivery delay to be used for this queue. Overrides any value set on the ServerPeer config

MaxDeliveryAttempts
The maximum number of times delivery of a message will be attempted before sending the message to the DLQ, if configured. If set to -1 (the default), the value from the ServerPeer config is used. Any other setting overrides the value set on the ServerPeer config.

Destination Security Configuration
`SecurityConfig` - allows you to determine which roles are allowed to read, write and create on the destination. It has exactly the same syntax and semantics as the security configuration in JBossMQ destinations.

The **`SecurityConfig`** element should contain one **`<security>`** element. The **`<security>`** element can contain multiple **`<role>`** elements. Each **`<role>`** element defines the access for that particular role.

If the **`read`** attribute is **`true`** then that role will be able to read (create consumers, receive messages or browse) this destination.

If the **`write`** attribute is **`true`** then that role will be able to write (create producers or send messages) to this destination.

If the **`create`** attribute is **`true`** then that role will be able to create durable subscriptions on this destination.

Note that the security configuration for a destination is optional. If a **`SecurityConfig`** element is not specified then the default security configuration from the Server Peer will be used.

Destination paging parameters

'Pageable Channels' are a sophisticated new feature available in JBoss Messaging.

If your application needs to support very large queues or subscriptions containing potentially millions of messages, then it's not possible to store them all in memory at once.

JBoss Messaging solves this problem but letting you specify the maximum number of messages that can be stored in memory at any one time, on a queue-by-queue, or topic-by-topic basis. JBoss Messaging then pages messages to and from storage transparently in blocks, allowing queues and subscriptions to grow to very large sizes without any performance degradation as channel size increases.

This has been tested with in excess of 10 million 2K messages on very basic hardware and has the potential to scale to much larger number of messages.

The individual parameters are:

`FullSize` - this is the maximum number of messages held by the queue or topic subscriptions in memory at any one time. The actual queue or subscription can hold many more messages than this but these are paged to and from storage as necessary as messages are added or consumed. If no value is specified, the default is **`75000`**.

`PageSize` - When loading messages from the queue or subscription this is the maximum number of messages to pre-load in one operation. If no value is specified, the default is **`2000`**.

`DownCacheSize` - When paging messages to storage from the queue they first go into a "Down Cache" before being written to storage. This enables the write to occur as a single operation thus aiding performance. This setting determines the max number of messages that the Down Cache will hold before they are flushed to storage. If no value is specified, the default is **`2000`**.

If you want to specify the paging parameters used for temporary queues then you need to specify them on the appropriate connection factory. See connection factory configuration for details.

Large values in destination paging parameters

Configuring large values in destination paging parameters can cause `OutOfMemory` exceptions when used with JDBC driver version 11.2.0.1.0 and Oracle 11g R1, R2 and RAC. For more information, see the Known Issues section in the JBoss Enterprise Application Platform 5.0.1 Release Notes.

CreatedProgrammatically

Returns **`true`** if the queue was created programmatically

MessageCount

Returns the total number of messages in the queue = number not being delivered + number being delivered + number being scheduled

ScheduledMessageCount

Returns the number of scheduled messages in the queue. This is the number of messages scheduled to be delivered at a later date.

Scheduled delivery is a feature of JBoss Messaging where you can send a message and specify the earliest time at which it will be delivered. E.g. you can send a message now, but the message won't actually be delivered until 2 hours time.

To do this, you just need to set the following header in the message before sending:

```
long now = System.currentTimeMillis();

Message msg = sess.createMessage();

msg.setLongProperty(JBossMessage.JMS_JBOSS_SCHEDULED_DELIVERY_PROP_NAME,
       now + 1000 * 60 * 60 * 2);

prod.send(msg);
```

MaxSize

A maximum size (in number of messages) can be specified for a queue. Any messages that arrive beyond this point will be dropped. The default is **`-1`** which is unbounded.

Clustered

Clustered destinations must have this set to **`true`**.

MessageCounter

Each queue maintains a message counter.

MessageStatistics

The statistics for the message counter

MessageCounterHistoryDayLimit

The maximum number of days to hold message counter history for. Overrides any value set on the ServerPeer.

ConsumerCount

The number of consumers currently consuming from the queue.

3.8.2. DropOldMessageOnRedeploy

When you re-deploy a queue service with a clustered attribute different from the one with which it has been previously deployed, all remaining messages in the queue will be deleted after the re-deployment if you set this parameter to true. Otherwise the messages will be reserved. Default is false.

Warning

When you re-deploy a destination, you need to shut down all the nodes in the cluster, make proper configuration change and then restart the nodes. Redeploying from a non-

clustered queue to a clustered one requires you set the Clustered attribute to true, and add the queue service configuration to each node. Redeploying from a clustered queue to a non-clustered requires you set the Clustered attribute to false in one of the queue configurations and delete all others in the cluster.

3.8.3. We now discuss the MBean operations of the Queue MBean

RemoveAllMessages

Remove (and delete) all messages from the queue.

Warning

Use this with caution. It will permanently delete all messages from the queue.

ListAllMessages

List all messages currently in the queue

There are two overloaded versions of this operation: One takes a JMS selector as an argument, the other does not. By using the selector you can retrieve a subset of the messages in the queue that match the criteria

ListDurableMessages

As listAllMessages but only lists the durable messages

There are two overloaded versions of this operation: One takes a JMS selector as an argument, the other does not. By using the selector you can retrieve a subset of the messages in the queue that match the criteria

ListNonDurableMessages

As listAllMessages but only lists the non durable messages

There are two overloaded versions of this operation: One takes a JMS selector as an argument, the other does not. By using the selector you can retrieve a subset of the messages in the queue that match the criteria

ResetMessageCounter

Resets the message counter to zero.

ResetMessageCounterHistory

Resets the message counter history.

ListMessageCounterAsHTML

Lists the message counter in an easy to display HTML format

ListMessageCounterHistoryAsHTML
Lists the message counter history in an easy to display HTML format

3.9. Configuring topics

3.9.1. We now discuss the MBean attributes of the Topic MBean

Name
The name of the topic

JNDIName
The JNDI name where the topic is bound

DLQ
The DLQ used for this topic. Overrides any value set on the ServerPeer config

ExpiryQueue
The Expiry queue used for this topic. Overrides any value set on the ServerPeer config

RedeliveryDelay
The redelivery delay to be used for this topic. Overrides any value set on the ServerPeer config

MaxDeliveryAttempts
The maximum number of times delivery of a message will be attempted before sending the message to the DLQ, if configured. If set to -1 (the default), the value from the ServerPeer config is used. Any other setting overrides the value set on the ServerPeer config.

Destination Security Configuration
`SecurityConfig` - allows you to determine which roles are allowed to read, write and create on the destination. It has exactly the same syntax and semantics as the security configuration in JBossMQ destinations.

The **`SecurityConfig`** element should contain one **`<security>`** element. The **`<security>`** element can contain multiple **`<role>`** elements. Each **`<role>`** element defines the access for that particular role.

If the **`read`** attribute is **`true`** then that role will be able to read (create consumers, receive messages or browse) this destination.

If the **`write`** attribute is **`true`** then that role will be able to write (create producers or send messages) to this destination.

If the **`create`** attribute is **`true`** then that role will be able to create durable subscriptions on this destination.

Note that the security configuration for a destination is optional. If a **`SecurityConfig`** element is not specified then the default security configuration from the Server Peer will be used.

Destination paging parameters

'Pageable Channels' are a sophisticated new feature available in JBoss Messaging.

If your application needs to support very large queues or subscriptions containing potentially millions of messages, then it's not possible to store them all in memory at once.

JBoss Messaging solves this problem but letting you specify the maximum number of messages that can be stored in memory at any one time, on a queue-by-queue, or topic-by-topic basis. JBoss Messaging then pages messages to and from storage transparently in blocks, allowing queues and subscriptions to grow to very large sizes without any performance degradation as channel size increases.

This has been tested with in excess of 10 million 2K messages on very basic hardware and has the potential to scale to much larger number of messages.

The individual parameters are:

`FullSize` - this is the maximum number of messages held by the queue or topic subscriptions in memory at any one time. The actual queue or subscription can hold many more messages than this but these are paged to and from storage as necessary as messages are added or consumed.

`PageSize` - When loading messages from the queue or subscription this is the maximum number of messages to pre-load in one operation.

`DownCacheSize` - When paging messages to storage from the queue they first go into a "Down Cache" before being written to storage. This enables the write to occur as a single operation thus aiding performance. This setting determines the max number of messages that the Down Cache will hold before they are flushed to storage.

If no values for **`FullSize`**, **`PageSize`**, or **`DownCacheSize`** are specified they will default to values 75000, 2000, 2000 respectively.

If you want to specify the paging parameters used for temporary queues then you need to specify them on the appropriate connection factory. See connection factory configuration for details.

CreatedProgrammatically

Returns **`true`** if the topic was created programmatically

MaxSize

A maximum size (in number of messages) can be specified for a topic subscription. Any messages that arrive beyond this point will be dropped. The default is **`-1`** which is unbounded.

Clustered

Clustered destinations must have this set to **`true`**

MessageCounterHistoryDayLimit

The maximum number of days to hold message counter history for. Overrides any value set on the ServerPeer.

MessageCounters
Return a list of the message counters for the subscriptions of this topic.

AllMessageCount
Return the total number of messages in all subscriptions of this topic.

DurableMessageCount
Return the total number of durable messages in all subscriptions of this topic.

NonDurableMessageCount
Return the total number of non durable messages in all subscriptions of this topic.

AllSubscriptionsCount
The count of all subscriptions on this topic

DurableSubscriptionsCount
The count of all durable subscriptions on this topic

NonDurableSubscriptionsCount
The count of all non durable subscriptions on this topic

DropOldMessageOnRedeploy
When you re-deploy a topic service with a clustered attribute different from the one with which it has been previously deployed, all remaining messages of its durable subscribers will be deleted after the re-deployment if you set this parameter to true. Otherwise the messages will be reserved. Default is false.

Warning

When you re-deploy a destination, you need to shut down all the nodes in the cluster, make proper configuration change and then restart the nodes. Redeploying from a non-clustered topic to a clustered one requires you set the Clustered attribute to true, and add the topic service configuration to each node. Redeploying from a clustered topic to a non-clustered one requires you set the Clustered attribute to false in one of the topic configurations and delete all others in the cluster.

3.9.2. We now discuss the MBean operations of the Topic MBean

RemoveAllMessages
Remove (and delete) all messages from the subscriptions of this topic.

Warning

Use this with caution. It will permanently delete all messages from the topic.

ListAllSubscriptions

List all subscriptions of this topic

ListDurableSubscriptions

List all durable subscriptions of this topic

ListNonDurableSubscriptions

List all non durable subscriptions of this topic

ListAllSubscriptionsAsHTML

List all subscriptions of this topic in an easy to display HTML format

ListDurableSubscriptionsAsHTML

List all durable subscriptions of this topic in an easy to display HTML format

ListNonDurableSubscriptionsAsHTML

List all non durable subscriptions of this topic in an easy to display HTML format

ListAllMessages

Lists all messages for the specified subscription.

There are two overloaded versions of this operation. One that takes a selector and one that does not. By specifying the selector you can limit the messages returned.

ListNonDurableMessages

Lists all non durable messages for the specified subscription.

There are two overloaded versions of this operation. One that takes a selector and one that does not. By specifying the selector you can limit the messages returned.

ListDurableMessages

Lists all durable messages for the specified subscription.

There are two overloaded versions of this operation. One that takes a selector and one that does not. By specifying the selector you can limit the messages returned.

3.10. Configuring Connection Factories

With the default configuration JBoss Messaging binds two connection factories in JNDI at start-up.

The first connection factory is the default non-clustered connection factory and is bound into the following JNDI contexts: **`/ConnectionFactory, /XAConnectionFactory, java:/ConnectionFactory, java:/XAConnectionFactory`**. This connection factory is provided to maintain compatibility with applications originally written against JBoss MQ which has no automatic failover or load balancing. This connection factory should be used if you do not require client side automatic failover or load balancing.

The second connection factory is the default clustered connection factory and is bound into the following JNDI contexts **`/ClusteredConnectionFactory, /ClusteredXAConnectionFactory, java:/ClusteredConnectionFactory, java:/ClusteredXAConnectionFactory`**.

You may want to configure additional connection factories, for instance if you want to provide a default client id for a connection factory, or if you want to bind it in different places in JNDI, if you want different connection factories to use different transports, or if you want to selective enable or disable load-balancing and/or automatic failover for a particular connection factory. Deploying a new connection factory is equivalent with adding a new ConnectionFactory MBean configuration to **`connection-factories-service.xml`**.

It is also possible to create an entirely new service deployment descriptor **`xxx-service.xml`** altogether and deploy it in **`$JBOSS_HOME/server/<your profile>/deploy`**.

Connection factories can support automatic failover and/or load-balancing by setting the corresponding attributes

An example connection factory configuration is presented below:

```
<mbean code="org.jboss.jms.server.connectionfactory.ConnectionFactory"
      name="jboss.messaging.connectionfactory:service=MyConnectionFactory"
      xmbean-dd="xmdesc/ConnectionFactory-xmbean.xml">
      <depends optional-attribute-name="ServerPeer">
                jboss.messaging:service=ServerPeer
      </depends>
      <depends optional-attribute-name="Connector">
                jboss.messaging:service=Connector,transport=bisocket
      </depends>
      <depends>jboss.messaging:service=PostOffice</depends>

      <attribute name="JNDIBindings">
         <bindings>
            <binding>/MyConnectionFactory</binding>
            <binding>/factories/cf</binding>
         </bindings>
      </attribute>

      <attribute name="ClientID">myClientID</attribute>

      <attribute name="SupportsFailover">true</attribute>

      <attribute name="SupportsLoadBalancing">false</attribute>

      <attribute name="LoadBalancingFactory">org.acme.MyLoadBalancingFactory</attribute>

      <attribute name="PrefetchSize">1000</attribute>

      <attribute name="SlowConsumers">false</attribute>
```

```
    <attribute name="StrictTck">true</attribute>

    <attribute name="SendAcksAsync">false</attribute>

    <attribute name="DefaultTempQueueFullSize">50000</attribute>

    <attribute name="DefaultTempQueuePageSize">1000</attribute>

    <attribute name="DefaultTempQueueDownCacheSize">1000</attribute>

    <attribute name="DupsOKBatchSize">10000</attribute>
</mbean>
```

The above example would create a connection factory with pre-configured client ID **`myClientID`** and bind the connection factory in two places in the JNDI tree: **`/MyConnectionFactory`** and **`/factories/cf`**. The connection factory overrides the default values for PreFetchSize, DefaultTempQueueFullSize, DefaultTempQueuePageSize, DefaultTempQueueDownCacheSize and DupsOKBatchSize, SupportsFailover, SupportsLoadBalancing and LoadBalancingFactory. The connection factory will use the default remoting connector. To use a different remoting connector with the connection factory change the **`Connector`** attribute to specify the service name of the connector you wish to use.

3.10.1. We now discuss the MBean attributes of the ConnectionFactory MBean

ClientID

Connection factories can be pre-configured with a client id. Any connections created using this connection factory will obtain this client id

JNDIBindings

The list of the JNDI bindings for this connection factory

PrefetchSize

This parameter specifies the window size in numbers of messages, for consumer flow control. The window size determines the number of messages a server can send to a consumer without blocking. Each consumer maintains a buffer of messages from which it consumes. Please note that TCP also implements its own flow control, so if you set this to too large a number, then the TCP window size may be hit before the prefetchSize, which can cause writes to block.

SlowConsumers

If you have very slow consumers, then you probably want to reduce the number of messages they buffer so that unnecessary buffering does not prevent the messages from being consumed by faster consumers. The lowest PrefetchSize allowed is 1. Setting SlowConsumers to true is equivalent to setting PrefetchSize to 1

StrictTck

Set this to true if you want strict JMS behavior as required by the TCK.

SendAcksAsync

Set this to true if you want acknowledgments to be sent asynchronously. This can speed up performance especially if you are using auto_acknowledge mode

Temporary queue paging parameters

DefaultTempQueueFullSize, DefaultTempQueuePageSize, DefaultTempQueueDownCacheSize are optional attributes that determine the default paging parameters to be used for any temporary destinations scoped to connections created using this connection factory. See the section on paging channels for more information on what these values mean. They will default to values of 200000, 2000 and 2000 respectively if omitted.

DupsOKBatchSize

When using a session with acknowledge mode of DUPS_OK_ACKNOWLEDGE this setting determines how many acknowledgments it will buffer locally before sending. The default value is **`2000`**

SupportsLoadBalancing

When using a connection factory with a clustered JBoss Messaging installation you can choose whether to enable client side connection load-balancing. This is determined by setting the attribute supportsLoadBalancing on the connection factory.

If load balancing is enabled on a connection factory then any connections created with that connection factory will be load-balanced across the nodes of the cluster. Once a connection is created on a particular node, it stays on that node.

The exact policy that determines how connections are load balanced is determined by the LoadBalancingFactory attribute

The default value is **`false`**

SupportsFailover

When using a connection factory with a clustered JBoss Messaging installation you can choose whether to enable client side automatic failover. This is determined by setting the attribute supportsFailover on the connection factory.

If automatic failover is enabled on a connection factory, then if a connection problem is detected with the connection then JBoss Messaging will automatically and transparently failover to another node in the cluster.

The failover is transparent meaning the user can carry on using the sessions, consumers, producers and connection objects as before.

If automatic failover is not required, then this attribute can be set to false. With automatic failover disabled it is up to the user code to catch connection exceptions in synchronous JMS operations and install a JMS ExceptionListener to catch exceptions asynchronously. When a connection is caught, the client side code should lookup a new connection factory using HAJNDI and recreate the connection using that.

The default value is **`false`**

DisableRemotingChecks

By default, when deploying a connection factory, JBoss Messaging checks that the corresponding JBoss Remoting Connector has "sensible" values. JBoss Messaging is very sensitive to the values and for many of them there's rarely a good reason to change them. To disable such sanity checking set this to false.

Warning

There is rarely a good reason to disable checking. Only do so if you are absolutely sure in what you are doing.

The default value is **`false`**

LoadBalancingFactory

If you are using a connection factory with client side load balancing then you can specify how the load balancing is implemented by overriding this attribute. The value must correspond to the name of a class which implements the interface org.jboss.jms.client.plugin.LoadBalancingFactory

The default value is org.jboss.jms.client.plugin.RoundRobinLoadBalancingFactory, which load balances connections across the cluster in a round-robin fashion

Connector

This specifies which remoting connector this connection factory uses. Different connection factories can use different connectors.

For instance you could deploy one connection factory that creates connections that use the HTTP transport to communicate to the server and another that creates connections that use the bisocket transport to communicate.

3.10.2. EnableOrderingGroup

This parameter controls whether the strict message ordering is enabled or not on the ConnectionFactory. If set to 'true', all messages that are sent from any producers created from this connection factory become ordering group messages.

The default value is false.

3.10.3. DefaultOrderingGroupName

the default name for the message ordering group. If absent, the group name will be generated automatically.

This attribute takes effect only if the EnableOrderingGroup attribute is true.

3.11. Configuring the remoting connector

JBoss Messaging uses JBoss Remoting for all client to server communication. For full details of what JBoss Remoting is capable of and how it is configured please consult the JBoss Remoting documentation.

The default configuration includes a single remoting connector which is used by the single default connection factory. Each connection factory can be configured to use its own connector.

The default connector is configured to use the remoting bisocket transport. The bisocket transport is a TCP socket based transport which only listens and accepts connections on the server side. I.e. connections are always initiated from the client side. This means it works well in typical firewall scenarios where only inbound connections are allowed on the server. Or where only outbound connections are allowed from the client.

The bisocket transport can be configured to use SSL where a higher level of security is required.

The other supported transport is the HTTP transport. This uses the HTTP protocol to communicate between client and server. Data is received on the client by the client periodically polling the server for messages. This transport is well suited to situations where there is a firewall between client and server which only allows incoming HTTP traffic on the server. Please note this transport will not be as performant as the bisocket transport due to the nature of polling and the HTTP protocl. Also please note it is not designed for high load situations.

No other remoting transports are currently supported by JBoss Messaging

You can look at remoting configuration under:

<JBoss>/server/<YourMessagingServer>/deploy/jboss-messaging.sar/remoting-bisocket-service.xml

Here is an example bisocket remoting configuration:

```
        <config>
           <invoker transport="bisocket">

              <!-- There should be no reason to change these parameters - warning!
                   Changing them may stop JBoss Messaging working correctly -->
              <attribute name="marshaller"
isParam="true">org.jboss.jms.wireformat.JMSWireFormat</attribute>
              <attribute name="unmarshaller"
isParam="true">org.jboss.jms.wireformat.JMSWireFormat</attribute>
              <attribute name="dataType" isParam="true">jms</attribute>
              <attribute name="socket.check_connection" isParam="true">false</attribute>
              <attribute name="timeout" isParam="true">0</attribute>
              <attribute name="serverBindAddress">${jboss.bind.address}</attribute>
              <attribute name="serverBindPort">4457</attribute>
              <attribute name="clientSocketClass"
isParam="true">org.jboss.jms.client.remoting.ClientSocketWrapper</attribute>
              <attribute name="serverSocketClass"
isParam="true">org.jboss.jms.server.remoting.ServerSocketWrapper</attribute>
              <attribute name="numberOfCallRetries" isParam="true">1</attribute>
              <attribute name="pingFrequency" isParam="true">214748364</attribute>
              <attribute name="pingWindowFactor" isParam="true">10</attribute>
              <attribute
name="onewayThreadPool">org.jboss.jms.server.remoting.DirectThreadPool</attribute>

              <!-- Periodicity of client pings. Server window by default is twice this figure
-->
              <attribute name="clientLeasePeriod" isParam="true">10000</attribute>

              <!-- Number of seconds to wait for a connection in the client pool to become
free -->
              <attribute name="numberOfRetries" isParam="true">10</attribute>
```

```
               <!-- Max Number of connections in client pool. This should be significantly
higher than
                    the max number of sessions/consumers you expect -->
               <attribute name="clientMaxPoolSize" isParam="true">200</attribute>

               <!-- Use these parameters to specify values for binding and connecting control
connections to
                    work with your firewall/NAT configuration
               <attribute name="secondaryBindPort">xyz</attribute>
               <attribute name="secondaryConnectPort">abc</attribute>
               -->

            </invoker>
            <handlers>
               <handler
subsystem="JMS">org.jboss.jms.server.remoting.JMSServerInvocationHandler</handler>
            </handlers>
         </config>
```

Please note that some of the attributes should not be changed unless you know exactly what you are doing. We will discuss the attributes that you may have a good reason to change:

- clientLeasePeriod - Clients periodically send heartbeats to the server to tell the server they are still alive. If the server does not receive a heartbeat after a certain time it will close down the connection and remove all resources on the server corresponding to the client's session. The clientLeasePeriod determines the period of heartbeats. The server will (by default) close a client if it does not receive a heartbeat in 2 * clientLeasePeriod ms. The actual factor gets automatically resized according to system load. The value is in milliseconds. The default value is 10000 ms.
- numberOfRetries - This effectively corresponds to the number of seconds JBoss Remoting will block on the client connection pool waiting for a connection to become free. If you have a very large number of sessions concurrently accessing the server from a client and you are experiencing issues due to not being able to obtain connections from the pool, you may want to consider increasing this value.
- clientMaxPoolSize - JBoss Remoting maintains a client side pool of TCP connections on which to service requests. If you have a very large number of sessions concurrently accessing the server from a client and you are experiencing issues due to not being able to obtain connections from the pool in a timely manner, you may want to consider increasing this value.
- secondaryBindPort - The bisocket transport uses control connections to pass control messages between server and client. If you want to work behind a firewall you may want to specify a particular value for this according to your firewall configuration. This is the address the secondary ServerSocket binds to.
- secondaryConnectPort - This is the port the client uses to connect. You may want to specify this to allow clients to work with NAT routers.
- maxPoolSize - This is the number of threads used on the server side to service requests.

By default JBoss Messaging binds to ${jboss.bind.address} which can be defined by: ./run.sh -c <yourconfig> -b yourIP.

You can change remoting-bisocket-service.xml if you want for example use a different communication port.

Warning

There is rarely a good reason to change values in the the bisocket or sslbisocket connector configuration apart from clientLeasePeriod, clientMaxPoolSize, maxRetries, numberOfRetries, secondaryBindPort or secondaryConnectPort. Changing them can cause JBoss Messaging to stop functioning correctly.

3.12. ServiceBindingManager

If you are using the JBoss AS ServiceBindingManager to provide different servers with different port ranges, then you must make sure that the JBoss Messaging remoting configuration specified in the JBoss Messaging section of the ServiceBindingManager xml file exactly matches that in remoting-bisocket-service.xml.

If you are using a newer version of JBM in an older version of JBAS then the example bindings in the AS distribution may well be out of date. It is therefore imperative that the relevant sections are overwritten with the remoting configuration from the JBM distribution.

See the chapter on installation for a description of how to set-up the service binding manager for JBoss Messaging

JBoss Messaging Clustering Notes

4.1. Unique server peer id

JBoss Messaging clustering should work out of the box in most cases with no configuration changes. It is however crucial that every node is assigned a unique server id, as specified in the installation guide.

Every node deployed must have a unique id, including those in a particular LAN cluster, and also those only linked by mesage bridges.

4.2. Clustered destinations

JBoss Messaging clusters JMS queues and topics transparently across the cluster. Messages sent to a distributed queue or topic on one node are consumable on other nodes. To designate that a particular destination is clustered simply set the clustered attribute in the destination deployment descriptor to true.

JBoss Messaging balances messages between nodes, catering for faster or slower consumers to efficiently balance processing load across the cluster.

If you do not want message redistribution between nodes, but still want to retain the other characteristics of clustered destinations. You can do this by not specifying the attribute ClusterPullConnectionFactoryName on the server peer

4.3. Clustered durable subs

JBoss Messaging durable subscriptions can also be clustered. This means multiple subscribers can consume from the same durable subscription from different nodes of the cluster. A durable subscription will be clustered if it's topic is clustered

4.4. Clustered temporary destinations

JBoss Messaging also supports clustered temporary topics and queues. All temporary topics and queues will be clustered if the post office is clustered

4.5. Non clustered servers

If you don't want your nodes to participate in a cluster, or only have one non clustered server you can set the clustered attribute on the postoffice to false

4.6. Message ordering in the cluster

If you wish to apply strict JMS ordering to messages, such that a particular JMS consumer consumes messages in the same order as they were produced by a particular producer, you can set the DefaultPreserveOrdering attribute in the server peer to true. By default this is false. The side effect of setting this to true is that messages cannot be distributed as freely around the cluster

Note

The redelivery scenario in order to guarantee message ordering is presently unsupported, however it may be supported in future releases.

4.7. Idempotent operations

If the call to send a persistent message to a persistent destination returns successfully with no exception, then you can be sure that the message was persisted. However if the call doesn't return successfully e.g. if an exception is thrown, then you *can't be sure the message wasn't persisted*. Since the failure might have occurred after persisting the message but before writing the response to the caller. This is a common attribute of any RPC type call: You can't tell by the call not returning that the call didn't actually succeed. Whether it's a web services call, an HTTP get request, an ejb invocation the same applies. The trick is to code your application so your operations are *idempotent* i.e. they can be repeated without getting the system into an inconsistent state. With a messaging system you can do this on the application level, by checking for duplicate messages, and discarding them if they arrive. Duplicate checking is a very powerful technique that can remove the need for XA transactions in many cases.

In the clustered case. JBM is by default configured to detect duplicate automatically messages by default

4.8. Clustered connection factories

If the supportsLoadBalancing attribute of the connection factory is set to true then consecutive create connection attempts will round robin between available servers. The first node to try is chosen randomly

If the supportsFailover attribute of the connection factory is set to true then automatic failover is enabled. This will automatically failover from one server to another, transparently to the user, in case of failure.

If automatic failover is not required or you wish to do manual failover (JBoss MQ style) this can be set to false, and you can supply a standard JMS ExceptionListener on the connection which will be called in case of connection failure. You would then need to manually close the connection, lookup a new connection factory from HA JNDI and recreate the connection.

JBoss Messaging XA Recovery Configuration

This section describes how to configure JBoss Transactions to handle XA recovery for JBoss Messaging resources.

JBoss Transactions recovery manager can easily be configured to continually poll for and recover JBoss Messaging XA resources, this provides an extremely high level of durability of transactions.

Enabling JBoss Transactions Recovery Manager to recover JBoss Messaging resources is a very simple matter and involves adding a line to the file ${JBOSS_CONFIG}/conf/jbossjta-properties.xml

Here's an example section of a jbossjta-properties.xml file with the line added (note the whole file is not shown)

```
    <properties depends="arjuna" name="jta">
       <!--
       Support subtransactions in the JTA layer?
       Default is NO.
       -->
       <property name="com.arjuna.ats.jta.supportSubtransactions" value="NO"/>
       <property name="com.arjuna.ats.jta.jtaTMImplementation"
          value="com.arjuna.ats.internal.jta.transaction.arjunacore.TransactionManagerImple"/
>
       <property name="com.arjuna.ats.jta.jtaUTImplementation"
          value="com.arjuna.ats.internal.jta.transaction.arjunacore.UserTransactionImple"/>

       <!--
          *** Add this line to enable recovery for JMS resources using DefaultJMSProvider ***
       -->
       <property name="com.arjuna.ats.jta.recovery.XAResourceRecovery.JBMESSAGING1"
          value="org.jboss.jms.server.recovery.MessagingXAResourceRecovery;java:/
DefaultJMSProvider"/>

    </properties>
```

In the above example the recovery manager will attempt to recover JMS resources using the JMSProviderLoader "DefaultJMSProvider"

DefaultJMSProvider is the default JMS provider loader that ships with JBoss AS and is defined in jms-ds.xml (or hajndi-jms-ds.xml in a clustered configuration). If you want to recovery using a different JMS provider loader - e.g. one corresponding to a remote JMS provider then just add another line and instead of DefaultJMSProvider specify the name of the remote JMS provider as specified in it's MBean configuration.

For each line you add, the name must be unique, so you could specify "com.arjuna.ats.jta.recovery.XAResourceRecovery.JBMESSAGING1", "com.arjuna.ats.jta.recovery.XAResourceRecovery.JBMESSAGING2, ..." etc.

In actual fact, the recovery also should work with any JMS provider that implements recoverable XAResources (i.e. it properly implements XAResource.recover()) , not just JBoss Messaging

Please note that to configure the recovery manager to recovery transactions from any node of the cluster it will be necessary to specify a line in the configuration for every node of the cluster

JBoss Messaging Message Bridge Configuration

6.1. Message bridge overview

JBoss Messaging includes a fully functional message bridge.

The function of the bridge is to consume messages from a source queue or topic, and send them to a target queue or topic, typically on a different server.

The source and target servers do not have to be in the same cluster which makes bridging suitable for reliably sending messages from one cluster to another, for instance across a WAN, and where the connection may be unreliable.

A bridge is deployed inside a JBoss AS instance. The instance can be the same instance as either the source or target server. Or could be on a third, separate JBoss AS instance.

A bridge is deployed as an MBean inside JBoss AS. Deployment is trivial - just drop the MBean descriptor into the deploy directory of a JBoss configuration which contains JBoss Messaging.

An example in docs/example/bridge demonstrates a simple bridge being deployed in JBoss AS, and moving messages from the source to the target destination

The bridge can also be used to bridge messages from other non JBoss Messaging JMS servers, as long as they are JMS 1.1 compliant.

The bridge has built in resilience to failure so if the source or target server connection is lost, e.g. due to network failure, the bridge will retry connecting to the source and/or target until they come back online. When it comes back online it will resume operation as normal.

The bridge can be configured with an optional JMS selector, so it will only consume messages matching that JMS selector

It can be configured to consume from a queue or a topic. When it consumes from a topic it can be configured to consume using a non durable or durable subscription

The bridge can be configured to bridge messages with one of three levels of quality of service, they are:

- QOS_AT_MOST_ONCE

  With this QoS mode messages will reach the destination from the source at most once. The messages are consumed from the source and acknowledged before sending to the destination. Therefore there is a possibility that if failure occurs between removing them from the source and them arriving at the destination they could be lost. Hence delivery will occur at most once. This mode is available for both persistent and non persistent messages.

- QOS_DUPLICATES_OK

  With this QoS mode, the messages are consumed from the source and then acknowledged after they have been successfully sent to the destination. Therefore there is a possibility that if failure occurs after sending to the destination but before acknowledging them, they could be sent again

when the system recovers. I.e. the destination might receive duplicates after a failure. This mode is available for both persistent and non persistent messages.

- QOS_ONCE_AND_ONLY_ONCE

  This QoS mode ensures messages will reach the destination from the source once and only once. (Sometimes this mode is known as "exactly once"). If both the source and the destination are on the same JBoss Messaging server instance then this can be achieved by sending and acknowledging the messages in the same local transaction. If the source and destination are on different servers this is achieved by enlisting the sending and consuming sessions in a JTA transaction. The JTA transaction is controlled by JBoss Transactions JTA implementation which is a fully recovering transaction manager, thus providing a very high degree of durability. If JTA is required then both supplied connection factories need to be XAConnectionFactory implementations. This mode is only available for persistent messages. This is likely to be the slowest mode since it requires logging on both the transaction manager and resource side for recovery. If you require this level of QoS, please be sure to enable XA recovery with JBoss Transactions.

Note

For a specific application it may possible to provide once and only once semantics without using the QOS_ONCE_AND_ONLY_ONCE QoS level. This can be done by using the QOS_DUPLICATES_OK mode and then checking for duplicates at the destination and discarding them. This may be possible to implement on the application level by maintaining a cache of received message ids on disk and comparing received messages to them. The cache would only be valid for a certain period of time so this approach is not as watertight as using QOS_ONCE_AND_ONLY_ONCE but may be a good choice depending on your specific application.

6.2. Bridge deployment

A message bridge is easily deployed by dropping the MBean descriptor in the deploy directory of your JBoss AS installation which contains JBoss Messaging

6.3. Bridge configuration

In this section we describe how to configure the message bridge

Here is an example of a message bridge configuration, with all the attributes shown. Note that some are commented out for this configuration, since it is not appropriate to specify them all at once. Which ones are specified depends on the configuration you want.

```
<mbean code="org.jboss.jms.server.bridge.BridgeService"
       name="jboss.messaging:service=Bridge,name=TestBridge"
       xmbean-dd="xmdesc/Bridge-xmbean.xml">

   <!-- The JMS provider loader that is used to lookup the source destination -->
   <depends optional-attribute-name="SourceProviderLoader">
       jboss.messaging:service=JMSProviderLoader,name=JMSProvider</depends>

   <!-- The JMS provider loader that is used to lookup the target destination -->
   <depends optional-attribute-name="TargetProviderLoader">
       jboss.messaging:service=JMSProviderLoader,name=JMSProvider</depends>
```

```
  <!-- The JNDI lookup for the source destination -->
  <attribute name="SourceDestinationLookup">/queue/A</attribute>

  <!-- The JNDI lookup for the target destination -->
  <attribute name="TargetDestinationLookup">/queue/B</attribute>

  <!-- The username to use for the source connection
  <attribute name="SourceUsername">bob</attribute>
  -->

  <!-- The password to use for the source connection
  <attribute name="SourcePassword">cheesecake</attribute>
  -->

  <!-- The username to use for the target connection
  <attribute name="TargetUsername">mary</attribute>
  -->

  <!-- The password to use for the target connection
  <attribute name="TargetPassword">hotdog</attribute>
  -->

  <!-- Optional: The Quality Of Service mode to use, one of:
       QOS_AT_MOST_ONCE = 0;
       QOS_DUPLICATES_OK = 1;
       QOS_ONCE_AND_ONLY_ONCE = 2; -->
  <attribute name="QualityOfServiceMode">0</attribute>

  <!-- JMS selector to use for consuming messages from the source
  <attribute name="Selector">specify jms selector here</attribute>
  -->

  <!-- The maximum number of messages to consume from the source
      before sending to the target -->
  <attribute name="MaxBatchSize">5</attribute>

  <!-- The maximum time to wait (in ms) before sending a batch to the target
      even if MaxBatchSize is not exceeded.
       -1 means wait forever -->
  <attribute name="MaxBatchTime">-1</attribute>

  <!-- If consuming from a durable subscription this is the subscription name
  <attribute name="SubName">mysub</attribute>
  -->

  <!-- If consuming from a durable subscription this is the client ID to use
  <attribute name="ClientID">myClientID</attribute>
  -->

  <!-- The number of ms to wait between connection retrues in the event connections
      to source or target fail -->
  <attribute name="FailureRetryInterval">5000</attribute>

  <!-- The maximum number of connection retries to make in case of failure,
      before giving up -1 means try forever-->
  <attribute name="MaxRetries">-1</attribute>

  <!-- If true then the message id of the message before bridging will be added
      as a header to the message so it is available to the receiver. Can then be
      sent as correlation id to correlate in a distributed request-response -->
  <attribute name="AddMessageIDInHeader">false</attribute>

</mbean>
```

We will now discuss each attribute

6.3.1. SourceProviderLoader

This is the object name of the JMSProviderLoader MBean that the bridge will use to lookup the source connection factory and source destination.

By default JBoss AS ships with one JMSProviderLoader, deployed in the file **`jms-ds.xml`** - this is the default local JMSProviderLoader. (This would be in **`hajndi-jms-ds.xml`** in a clustered configuration)

If your source destination is on different servers or even correspond to a different, non JBoss JMS provider, then you can deploy another JMSProviderLoader MBean instance which references the remote JMS provider, and reference that from this attribute. The bridge would then use that remote JMS provider to contact the source destination

Note that if you are using a remote non JBoss Messaging source or target and you wish once and only once delivery then that remote JMS provider must provide a fully functional JMS XA resource implementation that works remotely from the server - it is known that some non JBoss JMS providers do not provide such a resource

6.3.2. TargetProviderLoader

This is the object name of the JMSProviderLoader MBean that the bridge will use to lookup the target connection factory and target destination.

By default JBoss AS ships with one JMSProviderLoader, deployed in the file **`jms-ds.xml`** - this is the default local JMSProviderLoader. (This would be in **`hajndi-jms-ds.xml`** in a clustered configuration)

If your target destination is on a different server or even correspond to a different, non JBoss JMS provider, then you can deploy another JMSProviderLoader MBean instance which references the remote JMS provider, and reference that from this attribute. The bridge would then use that remote JMS provider to contact the target destination

Note that if you are using a remote non JBoss Messaging source or target and you wish once and only once delivery then that remote JMS provider must provide a fully functional JMS XA resource implementation that works remotely from the server - it is known that some non JBoss JMS providers do not provide such a resource

6.3.3. SourceDestinationLookup

This is the full JNDI lookup for the source destination using the SourceProviderLoader

An example would be /queue/mySourceQueue

6.3.4. TargetDestinationLookup

This is the full JNDI lookup for the target destination using the TargetProviderLoader

An example would be /topic/myTargetTopic

6.3.5. SourceUsername

This optional attribute is for when you need to specify the username for creating the source connection

6.3.6. SourcePassword

This optional attribute is for when you need to specify the password for creating the source connection

6.3.7. TargetUsername

This optional attribute is for when you need to specify the username for creating the target connection

6.3.8. TargetPassword

This optional attribute is for when you need to specify the password for creating the target connection

6.3.9. QualityOfServiceMode

This integer represents the desired quality of service mode

Possible values are:

- QOS_AT_MOST_ONCE = 0
- QOS_DUPLICATES_OK = 1
- QOS_ONCE_AND_ONLY_ONCE = 2

Please see *Section 6.1, "Message bridge overview"* for an explanation of what these mean.

6.3.10. Selector

This optional attribute can contain a JMS selector expression used for consuming messages from the source destination. Only messages that match the selector expression will be bridged from the source to the target destination

Please note it is always more performant to apply selectors on source topic subscriptions to source queue consumers.

The selector expression must follow the JMS selector syntax specified here: *http://java.sun.com/j2ee/1.4/docs/api/javax/jms/Message.html*

6.3.11. MaxBatchSize

This attribute specifies the maximum number of messages to consume from the source destination before sending them in a batch to the target destination. It's value must >= 1

6.3.12. MaxBatchTime

This attribute specifies the maximum number of milliseconds to wait before sending a batch to target, even if the number of messages consumed has not reached MaxBatchSize. It's value must can be -1 to represent 'wait forever', or >=1 to specify an actual time.

6.3.13. SubName

If the source destination represents a topic, and you want to consume from the topic using a durable subscription then this attribute represents the durable subscription name

6.3.14. ClientID

If the source destination represents a topic, and you want to consume from the topic using a durable subscription then this attribute represents the the JMS client ID to use when creating/looking up the durable subscription

6.3.15. FailureRetryInterval

This represents the amount of time in ms to wait between trying to recreate connections to the source or target servers when the bridge has detected they have failed

6.3.16. MaxRetries

This represents the number of times to attempt to recreate connections to the source or target servers when the bridge has detected they have failed. The bridge will give up after trying this number of times. -1 represents 'try forever'

6.3.17. AddMessageIDInHeader

If true, then the original message's message id will appended in the message sent to the destination in the header JBossMessage.JBOSS_MESSAGING_BRIDGE_MESSAGE_ID_LIST. If the message is bridged more than once each message-id will be appended. This enables a distributed request-response pattern to be used

Enabling JBoss Messaging Ordering Group

This section describes how to use the JBoss Messaging ordering group feature to achieve strict message ordering.

Message ordering groups is the JBoss Messaging implementation of strict message ordering. When the ordering group feature is enabled, message priorities no longer have an influence on the order that the messages are delivered. Messages in a particular ordering group will be delivered in the exact order that they arrive at the target queue (FIFO).

Ordering groups are identified by their string names and obey the following rules:

Rule One

The messages that form a part of an ordering group are delivered one at a time. The next message will not be delivered until the delivery of a previous message is completed. Message delivery completion is signaled by various means, depending on the acknowledge mode settings;

- The `CLIENT_ACKNOWLEDGE` mode results in the **`Message`**`.acknowledge()` method signaling the completion state.
- The `AUTO_ACKNOWLEDGE` mode results in the completion of the message being identified by either of the following:
  - a successful return from one of the **`MessageConsumer`**`.receive()` methods, or
  - a successful return from the `onMessage()` call of the **`MessageListener()`**.

DUPS_OK_ACKNOWLEDGE Mode

Ordering Group cannot work with `DUPS_OK_ACKNOWLEDGE` mode unless the batch acknowlegement size is limited to 1 (`DupsOKBatchSize`). The default `DupsOKBatchSize` value is **`2000`** which results in the JMS broker buffering 2000 messages prior to sending them. It is possible that messages will remain stuck in a queue when using StrictMessageOrdering in `DUPS_OK_ACKNOWLEDGE` mode as the second message in a series will not be sent until the previous message is acknowledged. Setting DupsOKBatchSize=1 ensures that the messages are not buffered and acknowledgments are sent following each message.

Note

If the message consumer is closed, the message being processed at the time of its closure will be deemed as completed. This is regardless of whether an `*_ACKNOWLEDGE` is called prior to the closure of the consumer.

Rule Two

In the case of the transactional receipt of messages, the next message will not be delivered until the transaction has been committed. This includes the acknowledgment of the receipt of the current

message. If the transaction is rolled back, the message will be canceled, sent back to the JMS server and made available for the next delivery.

7.1. How to Enable Message Ordering Group

There are two ways to use message ordering group: through programming and through configuration.

- The Programming Way

To make use of JBoss Messaging's ordering group feature, one has to obtain a JBossMessageProducer.

```
    JBossMessageProducer producer = (JBossMessageProducer)session.createProducer(queue);
```

JBossMessageProducer has two methods for starting/ending an ordering group.

```
public void enableOrderingGroup(String ogrpName) throws JMSException
```

Creating a ordering group with name ogrpName. Once called, the producer will send messages on behave of the ordering group. If null parameter is given, the name of the ordering group will be automatically generated. Calling this method more than once will always override the previous calls.

```
public void disableOrderingGroup() throws JMSException
```

Stop producing ordering group messages. Once called, the producer will stop sending out ordering group messages and return to its normal behavior.

- The Configuration Way

Users can configure a JBoss Messaging connection factory to enable ordering group. Two new attributes are added to the factory service configuration file.

```
EnableOrderingGroup -- set this property to true to enable the ordering group. Default is
 false; and
DefaultOrderingGroupName -- the default name for the message ordering group. If absent, the
 group
                            name will be generated automatically.
```

Once configured to enable ordering group on a connection factory, all messages that are sent from any producers created from this connection factory become ordering group messages.

Example:

```
   <mbean code="org.jboss.jms.server.connectionfactory.ConnectionFactory"
      name="jboss.messaging.connectionfactory:service=ConnectionFactory"
      xmbean-dd="xmdesc/ConnectionFactory-xmbean.xml">
      <depends optional-attribute-name="ServerPeer">jboss.messaging:service=ServerPeer</
depends>
      <depends optional-attribute-
name="Connector">jboss.messaging:service=Connector,transport=bisocket</depends>
```

```
    <depends>jboss.messaging:service=PostOffice</depends>

    <attribute name="JNDIBindings">
       <bindings>
          <binding>/MyConnectionFactory</binding>
          <binding>/XAConnectionFactory</binding>
          <binding>java:/MyConnectionFactory</binding>
          <binding>java:/XAConnectionFactory</binding>
       </bindings>
    </attribute>

    <!-- This are the two properties -->
    <attribute name="EnableOrderingGroup">true</attribute>
    <attribute name="DefaultOrderingGroupName">MyOrderingGroup</attribute>
 </mbean>
```

The good thing about this way is the user doesn't need to make any coding effort to get message ordering functionality.

7.2. Notes and Limitations

- Ordering group doesn't work with topics. Users requiring order groups have to user queues.
- Ordering group shouldn't be used together with message selectors and scheduled delivery.
- If a message is 'dead' (goes to DLQ) or expired (goes to ExpiryQueue), this message is considered completed and next message will be available for delivery.
- When using a ConnectionConsumer, ordering of the messages will be observed. However, it doesn't control which session will be receiving the next message.
- In case of Distributed Queue, user should use HASingleton to make sure ordering group works properly.

Appendix A. Revision History

Revision 1.1 Wed Dec 02 2009 Laura Bailey *lbailey@redhat.com*

Corrections for JBPAPP-3200.