

14

Setting Up Java Message Service (JMS) Resources

Objectives

After completing this lesson, you should be able to do the following:

- Describe Java Message Service
- Describe how Oracle WebLogic Server JMS is implemented
- Configure JMS server
- Configure connection factories
- Configure queues and topics
- Configure persistent messages
- Deploy an application that uses JMS
- Monitor JMS resources and messages

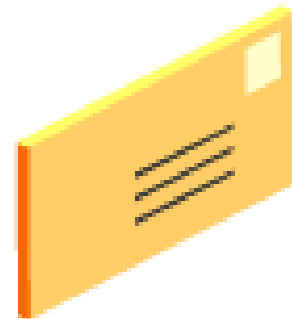
Road Map

- Oracle WebLogic Server JMS administration
 - JMS overview
 - JMS server and modules
 - Types of JMS destinations
- Configuring JMS objects
- Durable subscribers and persistent messaging
- Monitoring JMS



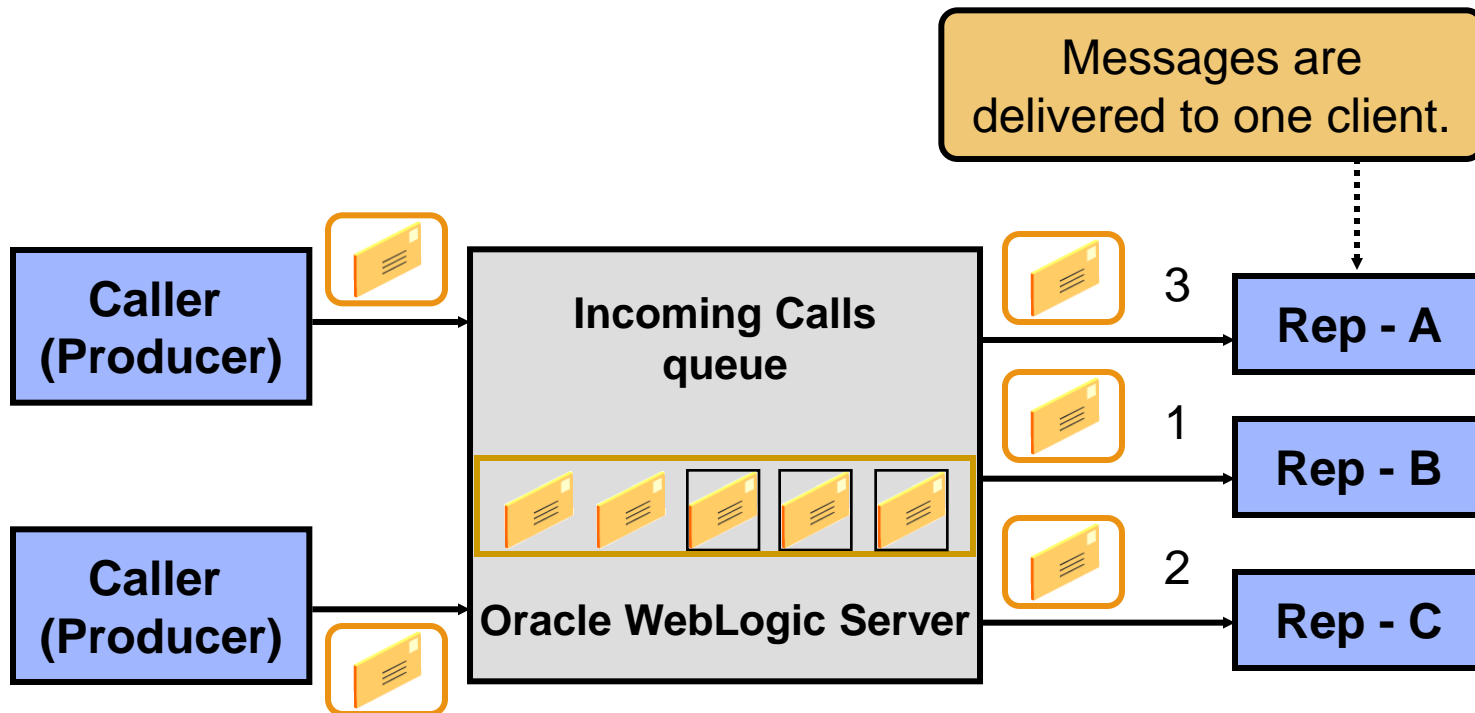
Message-Oriented Middleware

- The message-oriented architecture enables asynchronous and cross-platform integration of applications.
- Message-oriented middleware refers to an infrastructure that supports messaging.
- Typical message-oriented middleware architectures define the following elements:
 - Message structure
 - The way to send and receive messages
 - Scaling guidelines



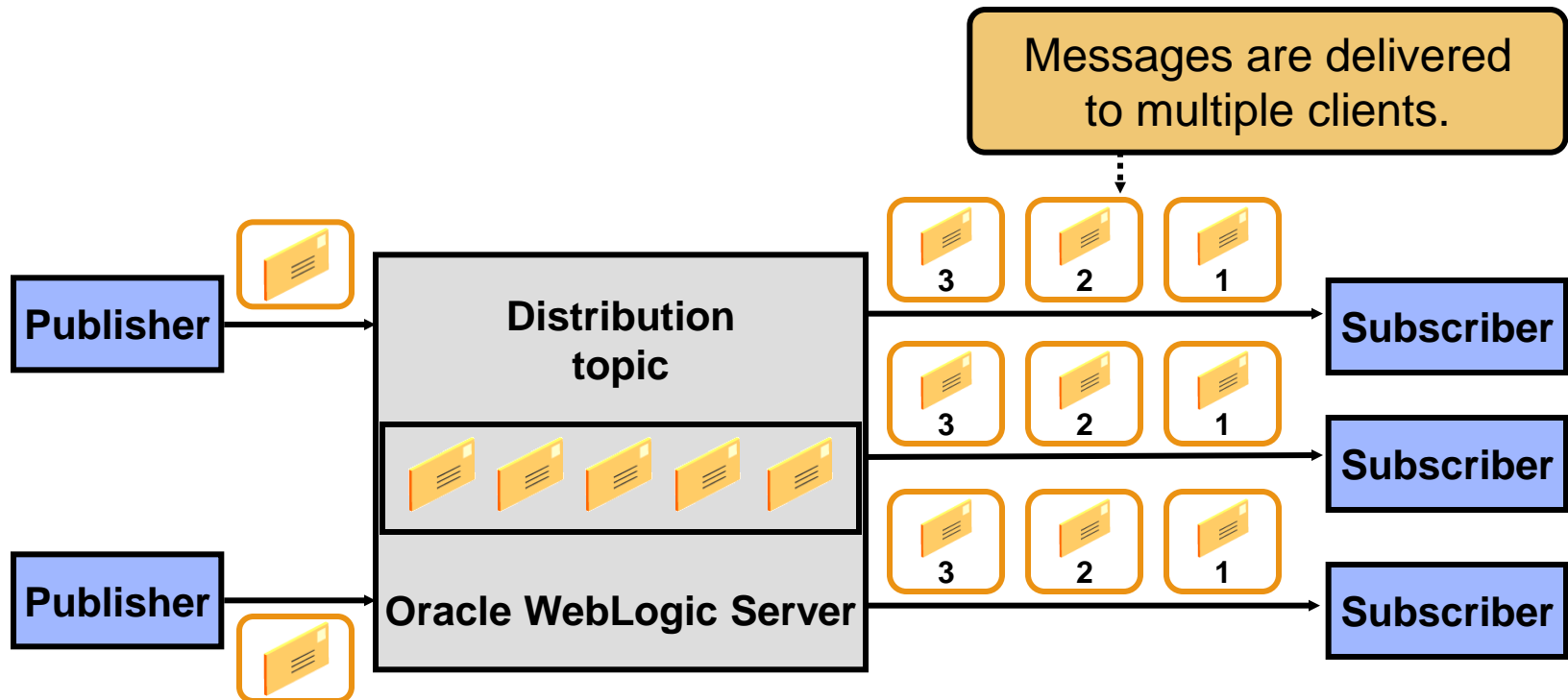
Point-To-Point Queue

Many message producers can serialize messages to multiple receivers in a queue.



Publish/Subscribe Topics

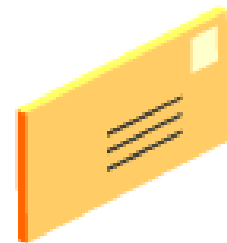
Publishing and subscribing to a topic decouples producers from consumers.



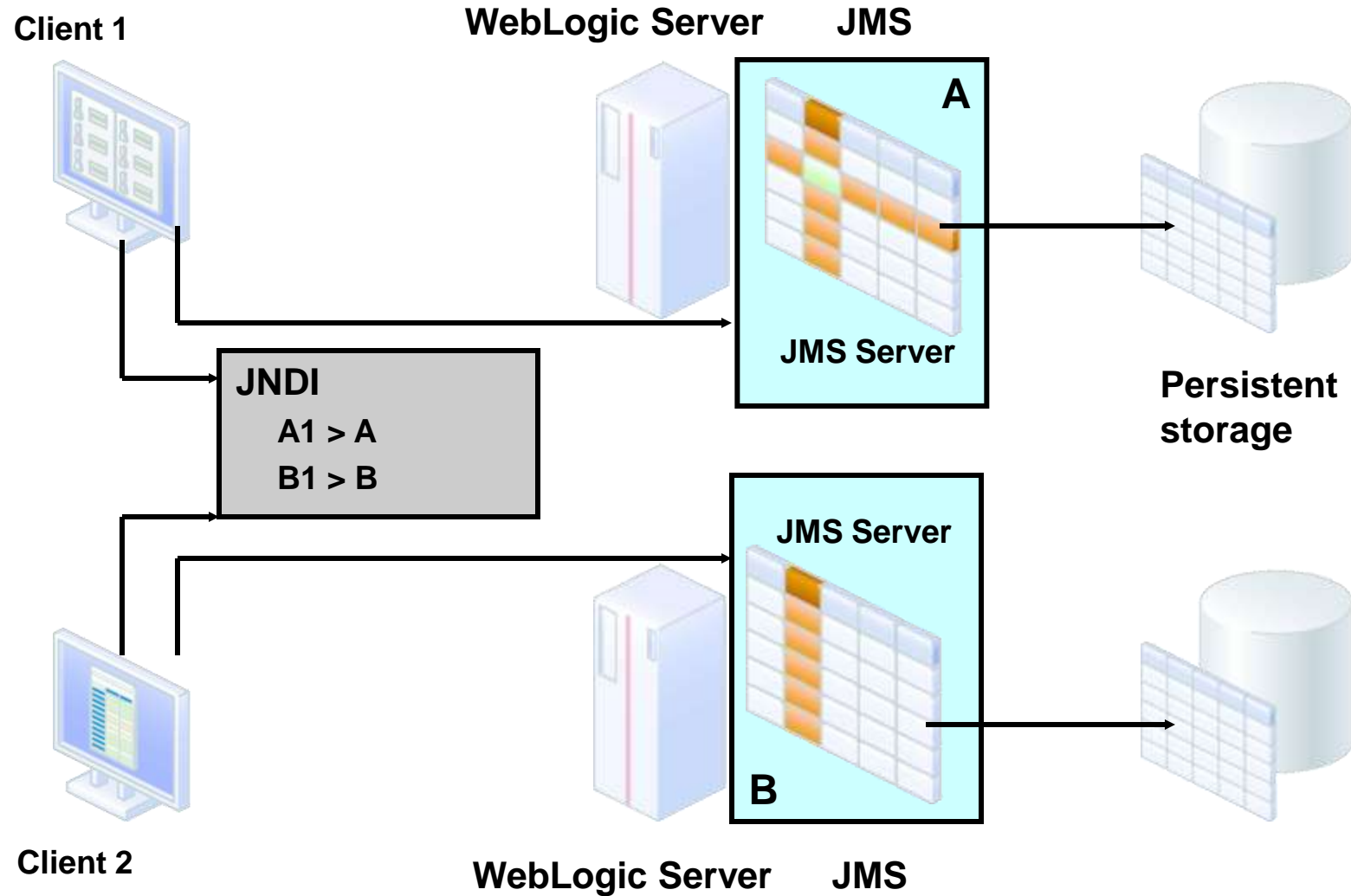
Oracle WebLogic Server JMS Features

Oracle WebLogic Server JMS supports:

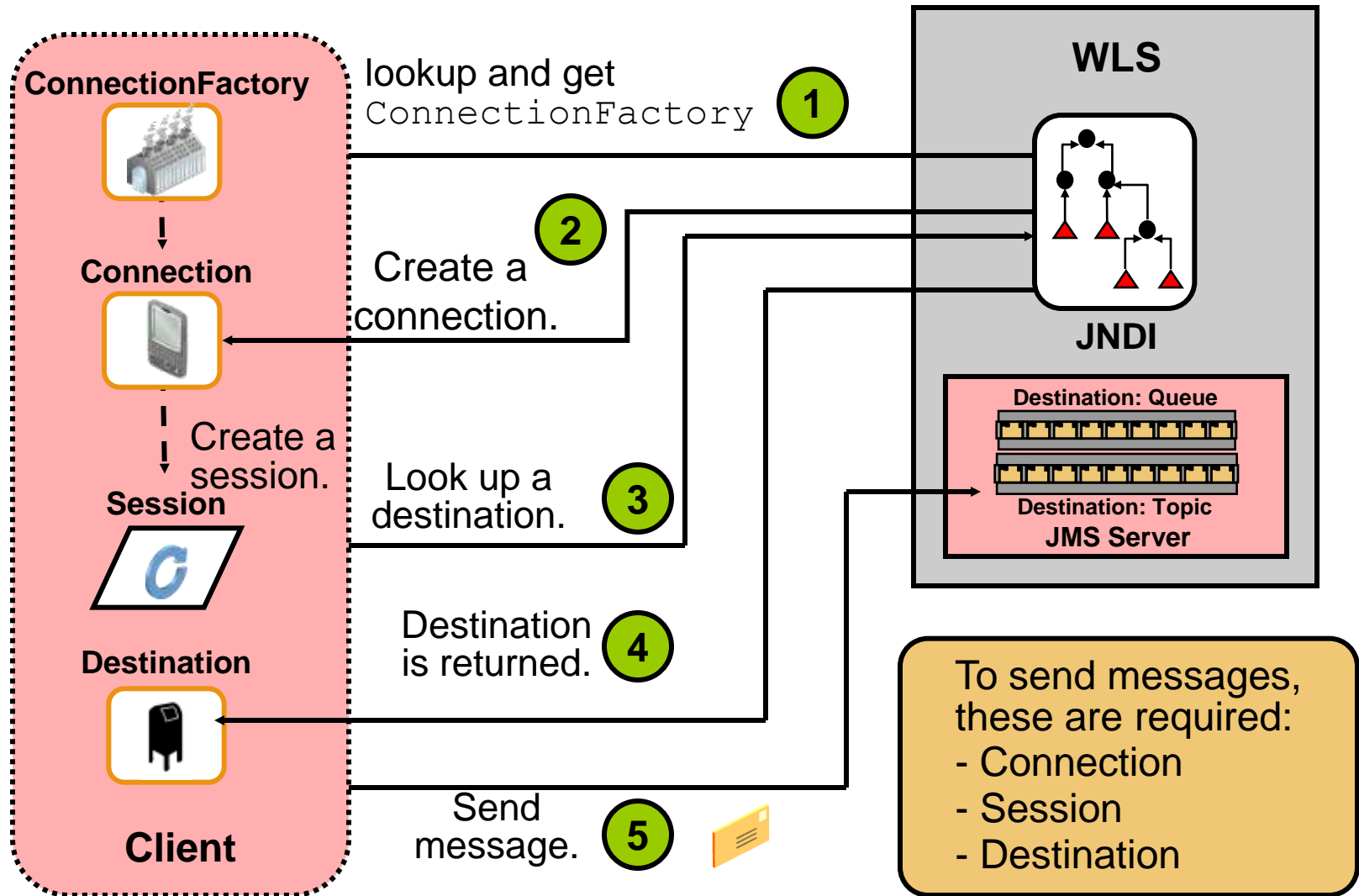
- Both the point-to-point and Publish/Subscribe JMS models
- Acknowledgement-based guaranteed delivery
- Transactional message delivery
- Durable subscribers
- Distributed destinations
- Recovery from failed servers



Oracle WLS JMS Architecture

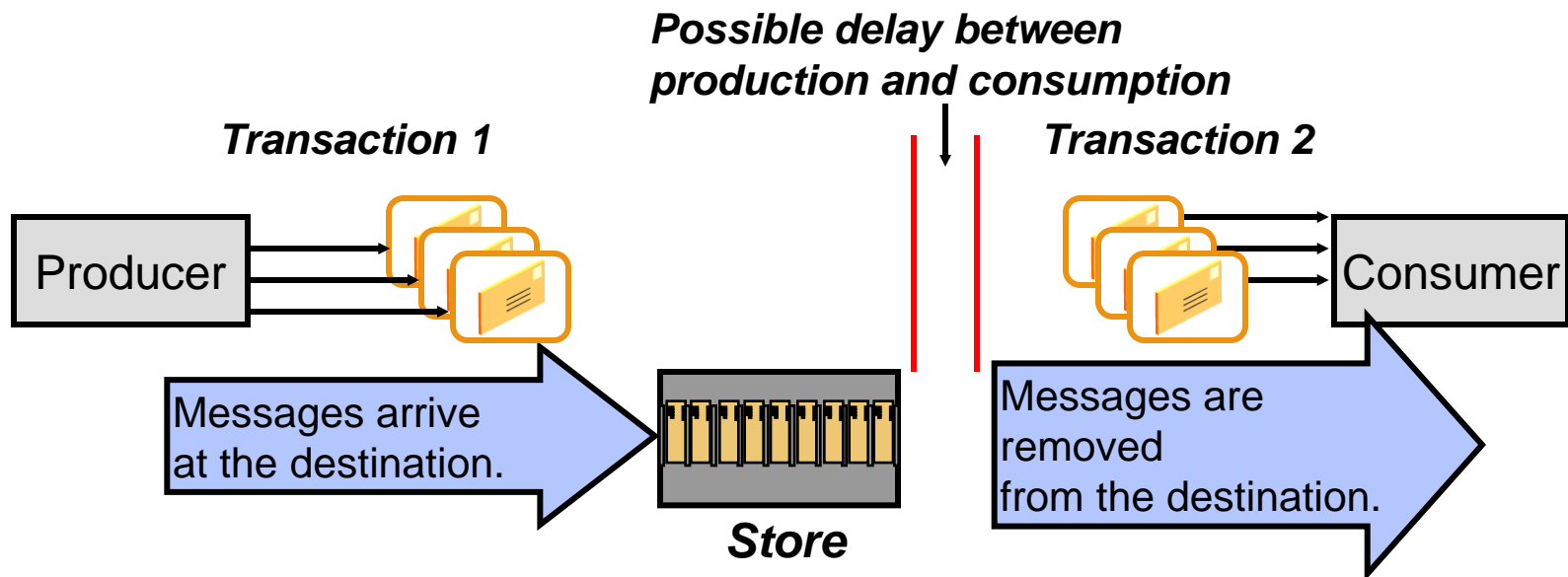


Typical JMS Messaging Process



Transacted Messaging

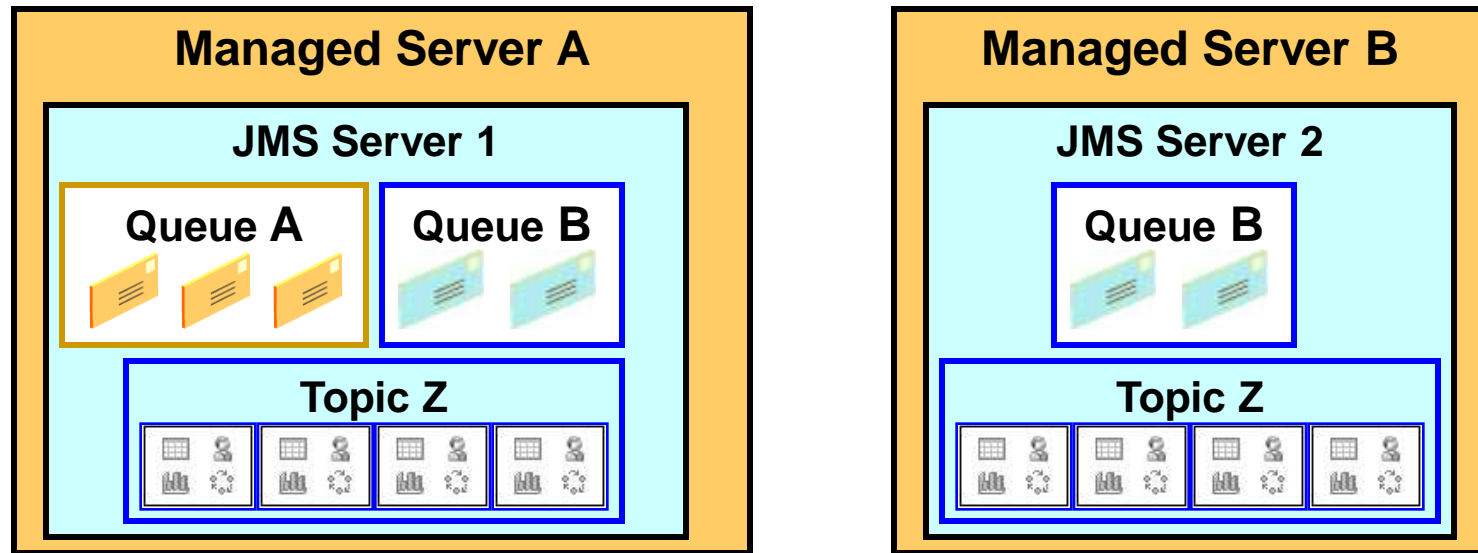
- A JMS client can use Java Transaction API (JTA) to participate in a distributed transaction.
- Alternatively, a JMS client can demarcate transactions that are local to the JMS session through a transacted session.
- Participation in a transaction is optional.



JMS Administrative Tasks

- Creating and monitoring JMS servers
- Creating connection factories
- Creating and monitoring destinations
- Creating JMS stores
- Configuring paging thresholds and quotas
- Configuring durable subscriptions
- Managing JMS service failover

Oracle WLS JMS Implementation



Resource definitions: In JMS modules

JMS Module A

SubDeployment 1:

Queue A: Target (JMS Server1)

SubDeployment 2:

Queue B: Target (JMS Server 1 and JMS Server 2)

SubDeployment 3:

Topic Z: Target (JMS Server 1 and JMS Server 2)

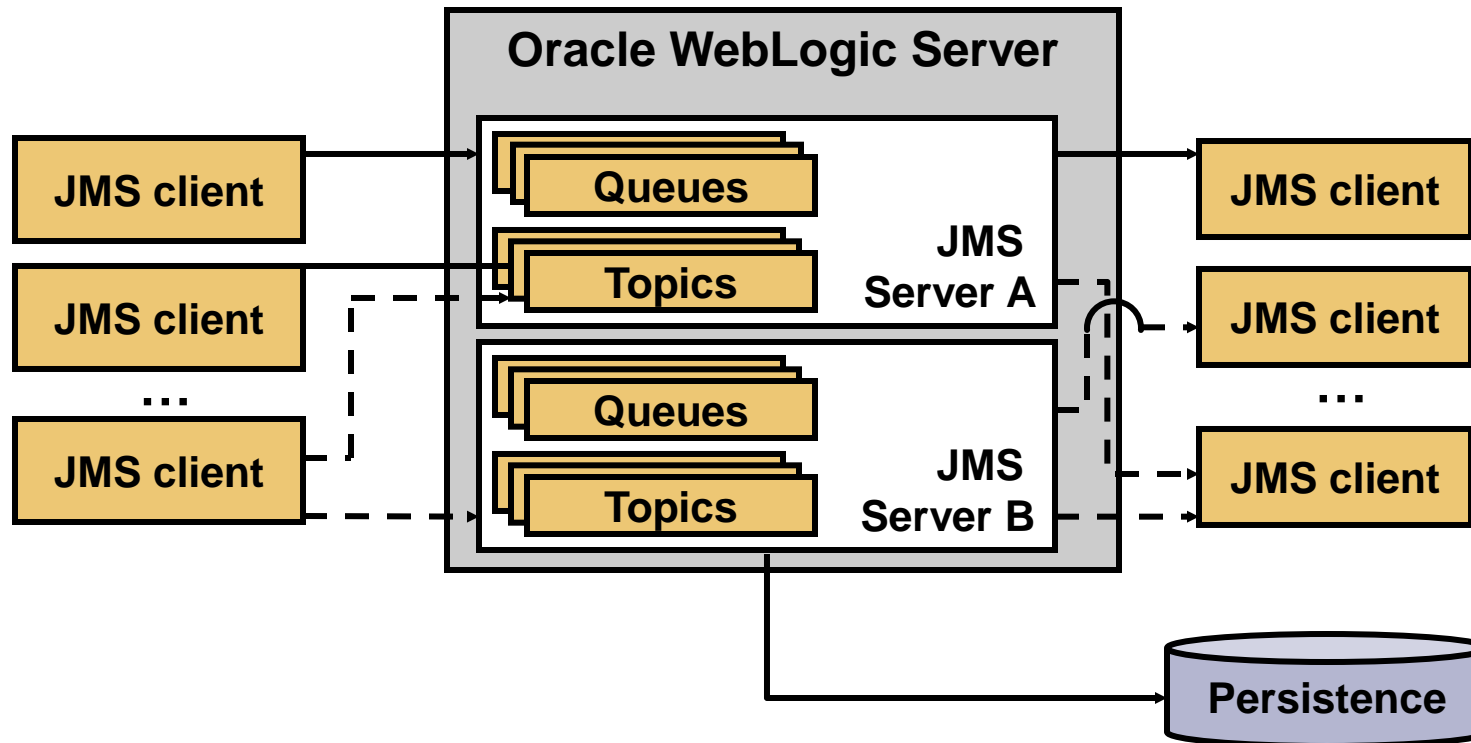
Road Map

- Oracle WebLogic Server JMS administration
- Configuring JMS objects
 - Configuring JMS servers
 - Configuring JMS modules and subdeployments
 - Configuring connection factories
 - Configuring destinations
- Durable subscribers and persistent messaging
- Monitoring JMS



Oracle WLS JMS Server

- In Oracle WLS, the messaging service is implemented through a JMS server.
- A JMS server receives and distributes messages.



Creating a JMS Server

Change Center

View changes and restarts

No pending changes exist. Click the Release Configuration button to allow others to edit the domain.

Lock & Edit

Release Configuration

Domain Structure

- MedRecDomain
 - Environment
 - Deployments
 - Services
 - Messaging
 - JMS Servers**
 - Store-and-Forward Agents
 - JMS Modules
 - Path Services
 - Bridges
 - JDBC
 - Persistent Stores
 - Foreign JNDI Providers

Summary of JMS Servers

JMS servers act as management containers for the queues and topics in JMS modules that are targeted to the JMS server.

This page summarizes the JMS servers that have been created in the current WebLogic Server domain.

Create a New JMS Server

Back Next Finish Cancel

JMS Server Properties

The following properties will be used to identify your new JMS Server.

* Indicates required fields

What would you like to name your new JMS Server?

* Name: HR-JMS-Server

Specify persistent store for the new JMS Server.

Persistent Store: (none) Create a New Store

Back Next Finish Cancel

Configuring a JMS Server

Summary of JMS Servers

JMS servers act as management containers for the queues and topics in JMS modules that are targeted.

This page summarizes the JMS servers that have been created.

[Customize this table](#)

JMS Servers(Filtered - More Columns Exist)

<input type="checkbox"/>	Name	
<input type="checkbox"/>	HRJMSServer	
<input type="checkbox"/>	MedRecJMSServer_auto_1	
<input type="checkbox"/>	MedRecJMSServer_auto_2	

Settings for HRJMSServer

Configuration | Logging | Targets | Monitoring | Control | Notes

General | Thresholds and Quotas | Session Pools

JMS servers act as management containers for the queues and topics in JMS modules for its destinations is to maintain information on what persistent store is used for any maintain the states of durable subscribers created on the destinations.

Use this page to define the general configuration parameters for this JMS server.

Name: HRJMSServer

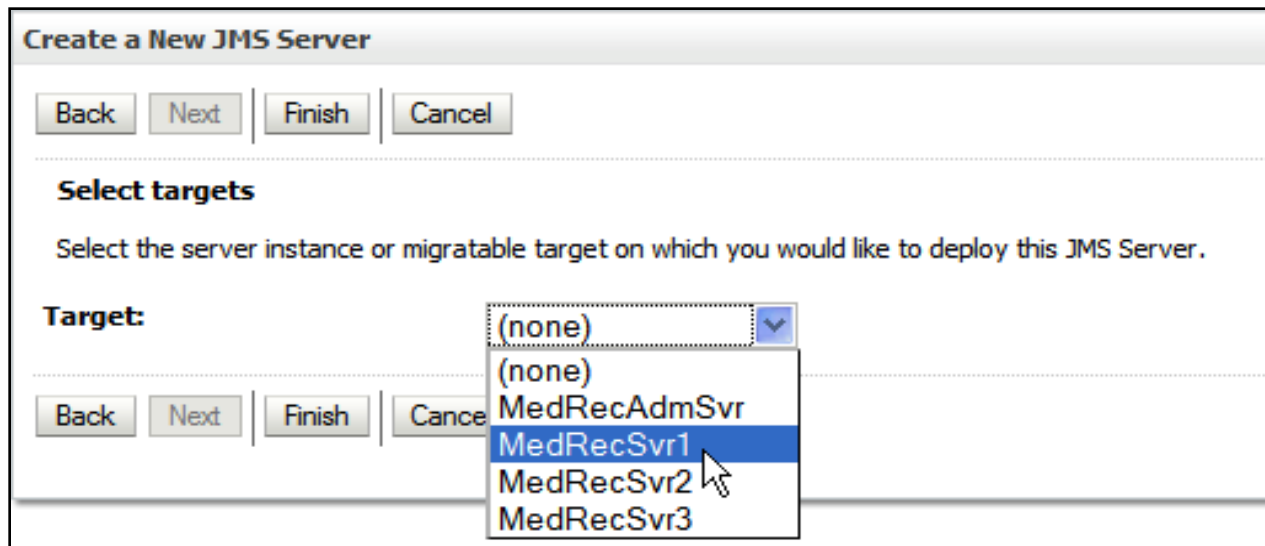
Persistent Store: (none)

Paging Directory:

Message Buffer Size: -1

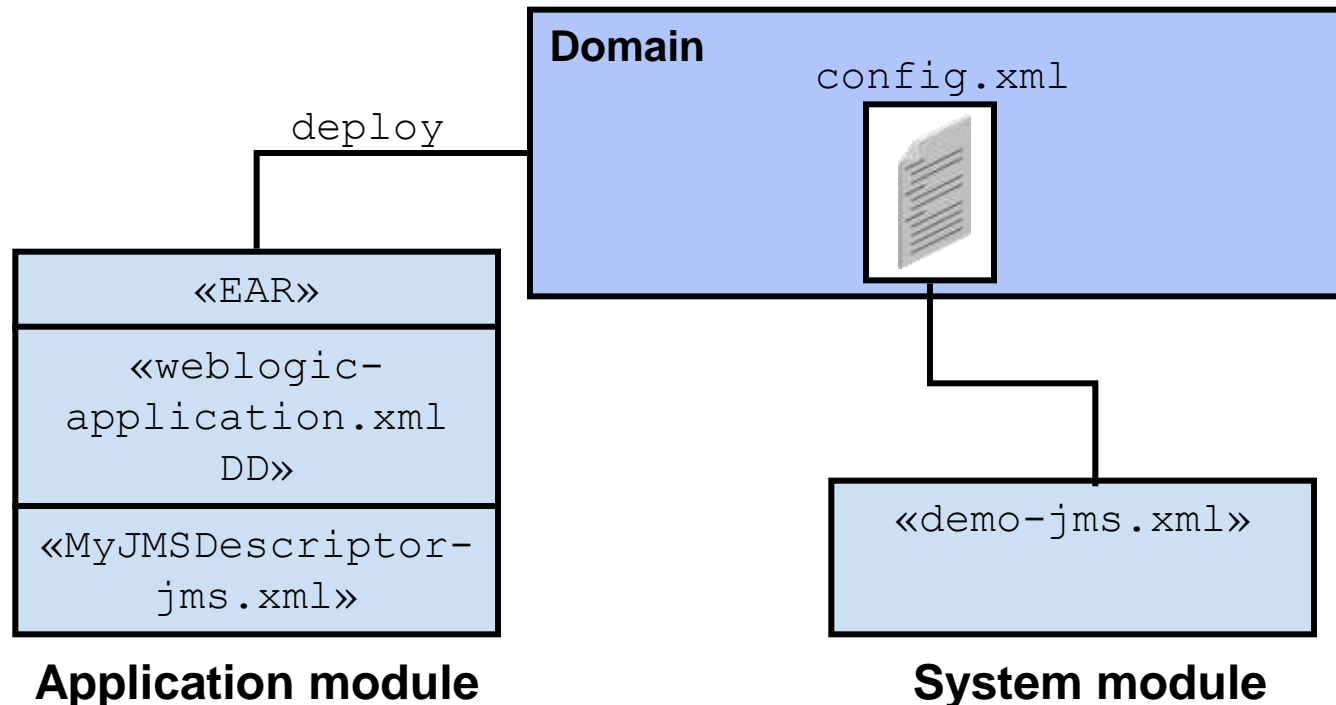
Targeting a JMS Server to a Managed Server

- By appropriately selecting managed servers, you can target where the JMS queue or topic will be managed.
- The JMS server is associated with only one WebLogic Server instance.
- If you want a JMS server on each server in a cluster, you must configure a JMS server for each server.



JMS Modules

- JMS resources can be configured either as system modules or as application modules.
- As an administrator, you normally configure system modules.



Modular JMS Resource Configuration and Deployment

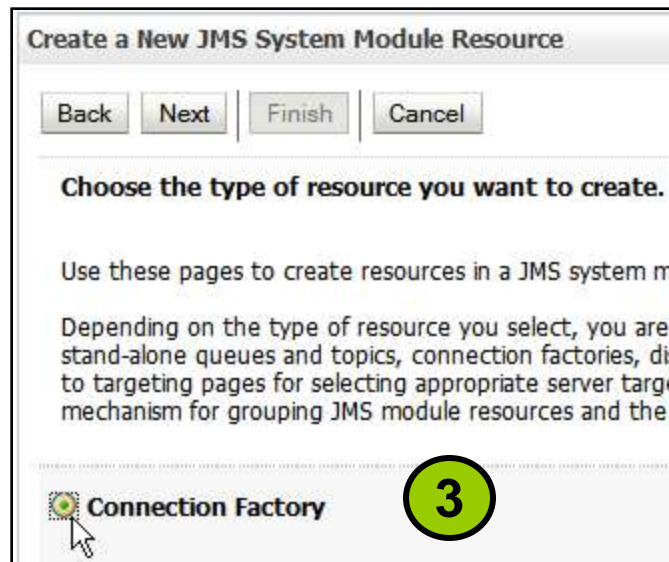
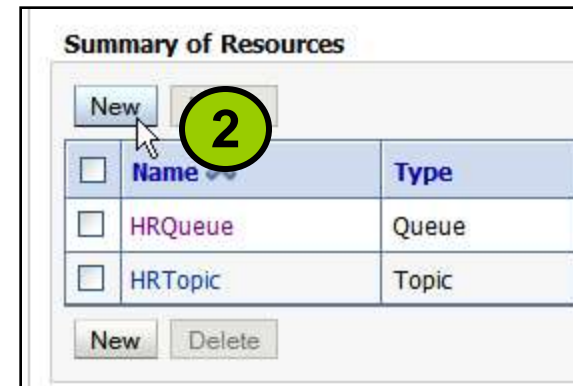
- Modular deployment simplifies the task of migrating JMS resources between environments, such as:
 - From development to integration
 - From system test to production
- You can migrate your application and the required JMS configuration:
 - Without opening an EAR file
 - Without extensive manual JMS reconfiguration

Connection Factories

- JMS connection factories are used to set default client connection parameters, including:
 - Message priority
 - Message time-to-live (TTL)
 - Message persistence
 - Transactional behavior
 - Acknowledgement policy
 - Flow control
- WLS provides a default client connection factory that:
 - Uses WebLogic's default connection settings
 - Is located on the server JNDI tree at `weblogic.jms.ConnectionFactory`



Creating a Connection Factory



Configuring a Connection Factory

Settings for HR_Conn_Fact

Configuration

Subdeployment

Notes

General

Default Delivery

Client

Transactions

Flow Control

Load Balance

Save

Use this page to define the default delivery configuration parameters for this JMS connection time to live, etc.

Default Priority:

4

Default Time-to-Live:

0

Default Time-to-Deliver:

0

Default Delivery Mode:

Persistent

Default Redelivery Delay:

0

Default Compression Threshold:

2147483647

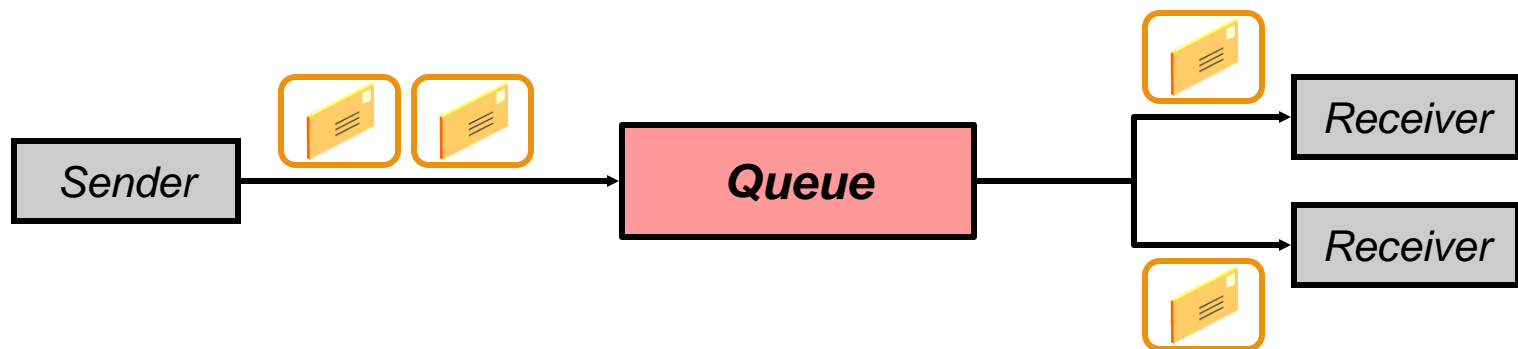
Destination

- A destination is a lightweight object that is stored in JNDI.
- It is the target on a JMS server for sending messages and the location from where messages will be consumed.
- The JMS destination types are:
 - Queue (for the point-to-point model)
 - Topic ((for the Publish/Subscribe model)

Queue Destinations

In JMS point-to-point messaging, note the following:

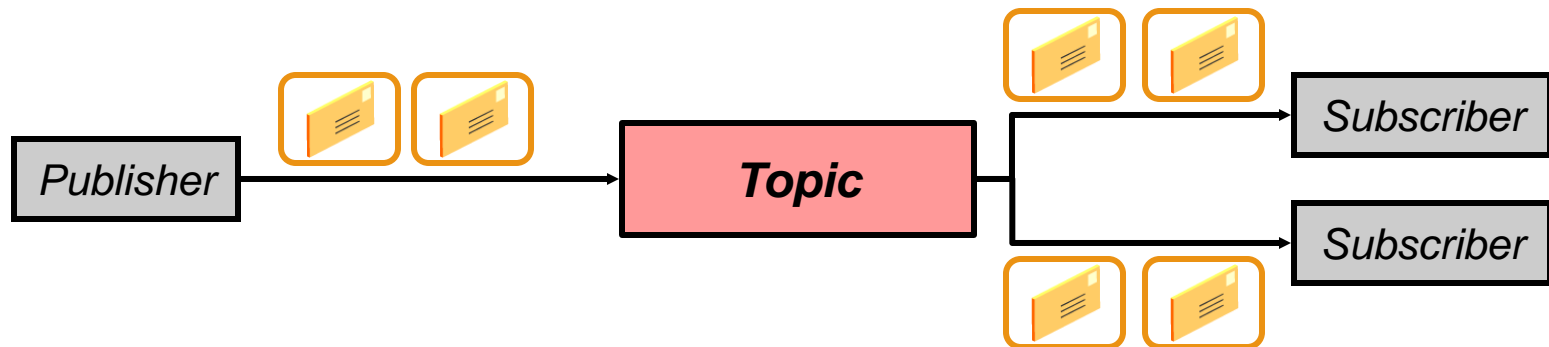
- Clients communicate with a queue destination.
- Messages are distributed to consumers in a serial fashion (first in, first out).
- Each message is delivered only to a single consumer.



Topic Destinations

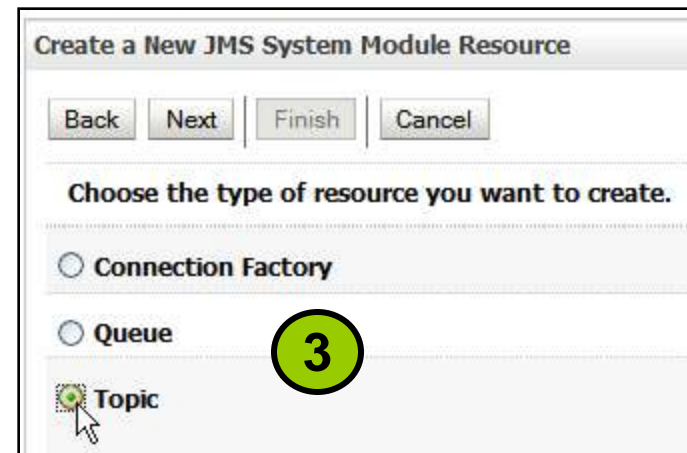
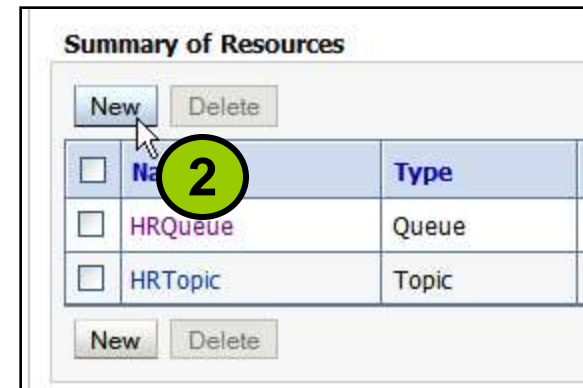
In JMS Publish/Subscribe messaging, the following is true:

- Clients communicate with a topic destination.
- Messages are broadcast to all subscribers.
- A message can be saved until at least one subscriber has consumed it (“durable”).



Creating a Destination (Topic)

- The steps to create a topic are shown here.
- Steps to create a queue are also similar.



Creating a Destination (Topic)

Create a New JMS System Module Resource

Back Next Finish Cancel

JMS Destination Properties

* Name: HRTopic1

JNDI Name: hrtopic1

Template: None

Back Next Finish Cancel

Create a New JMS System Module Resource

Back Next Finish Cancel

Select the subdeployment you want to use. If you select (none), no targeting will occur.

Subdeployments: (none) Create a New Subdeployment

What targets do you want to: HRSubDeployment?

Targets :

Back Next Finish Cancel

Threshold, Quota, and Paging

- Thresholds and Quotas enable you to control the size and number of message flow through JMS Servers.
- A threshold is a limit that triggers flow control, and logged warnings.
- A quota is a limit defined for the JMS-administered objects; it includes the following values:
 - The maximum number of bytes that can be stored
 - The maximum number of messages that can be stored
- The Message Paging feature enables automatic clearing of virtual memory especially for non-persistent messages.
- You can specify an appropriate folder structure for writing paged-out messages.

Configuring Thresholds and Quotas

Settings for HRJMSServer

Configuration Logging Targets Monitoring Control Notes

General **Thresholds and Quotas** Session Pools

— Thresholds —

Bytes Threshold High:

Bytes Threshold Low:

Messages Threshold High:

Messages Threshold Low:

— Quotas —

Bytes Maximum:

Messages Maximum:

Blocking Send Policy: ▼

Maximum Message Size:

Road Map

- Oracle WebLogic Server JMS administration
- Configuring JMS objects
- Durable subscribers and persistent messaging
 - Durable subscribers
 - Configuring durable subscribers
 - Persistent and nonpersistent messages
 - Persistent backing stores using the Console
- Monitoring JMS

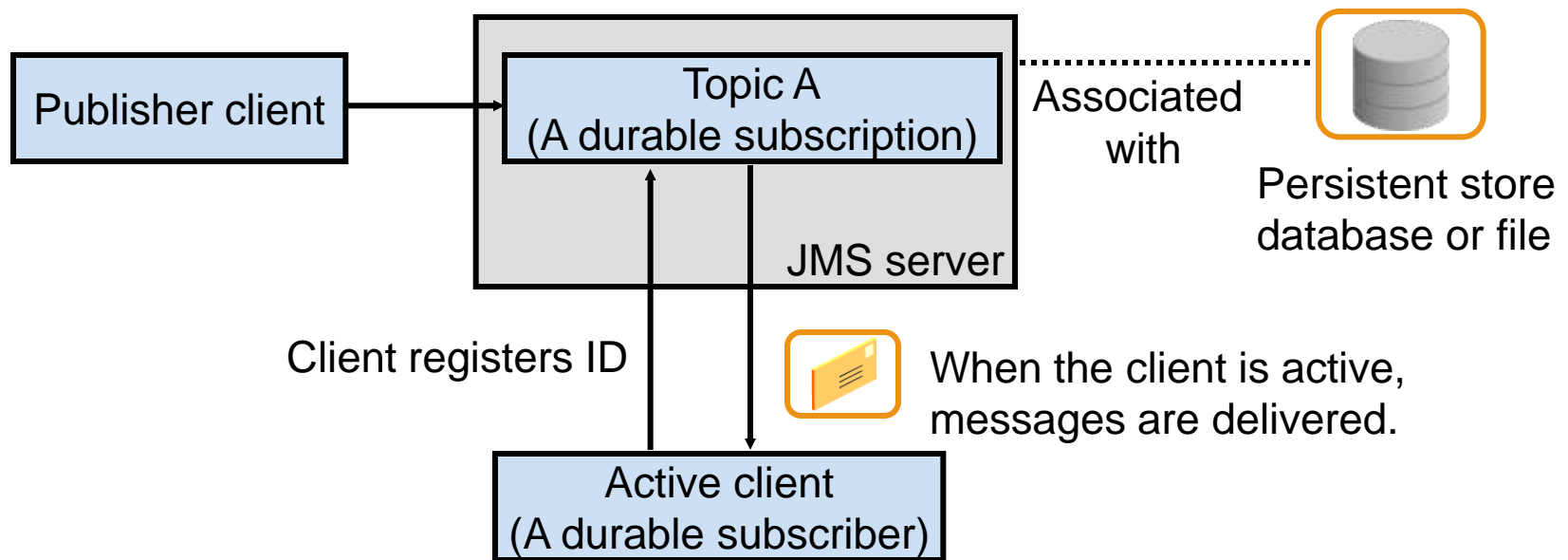


Durable Subscribers and Subscriptions

- Durable subscribers register durable subscriptions for guaranteed message delivery even if the subscribers are inactive.
- A subscriber is considered active if the Java object that represents it exists.
- By default, subscribers are nondurable.
- Administrators:
 - Specify where the messages are persisted
 - Configure persistent connection factories and destinations

How a Durable Subscription Works

- Durable subscription is effective only when the client is inactive during the time that the message is published.
- When the client becomes active again, its ID is used to retrieve and redeliver messages.

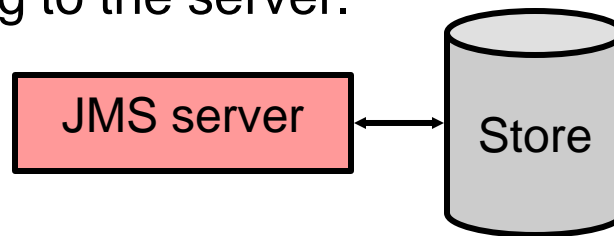


Configuring a Durable Subscription

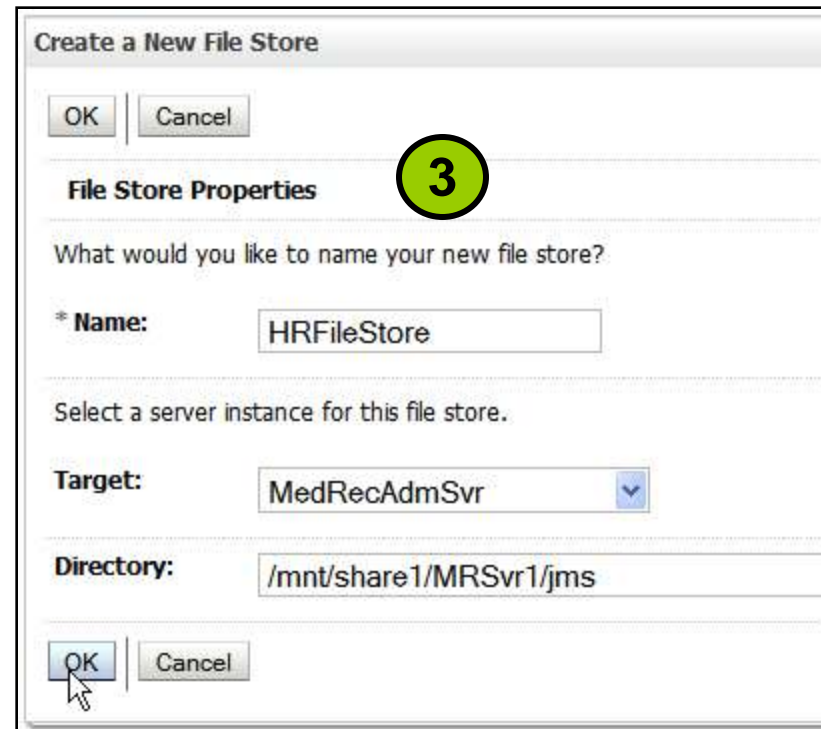
- To configure durable subscriptions, an administrator must:
 - Create and configure a JMS store
 - Configure connection factories or destinations as persistent
 - Associate the JMS store with the JMS server
- The JMS store can be configured to use either of the following:
 - A file store
 - A JDBC Store (a connection pool)

Persistent Messaging

- A persistent store is a physical repository for storing persistent JMS messages.
- WebLogic JMS writes persistent messages to a disk-based file or JDBC-accessible database.
- WebLogic supports guaranteed messaging using persistent stores:
 - In-progress messages can be delivered despite server restart.
 - Topic subscribers can consume missed messages despite reconnecting to the server.

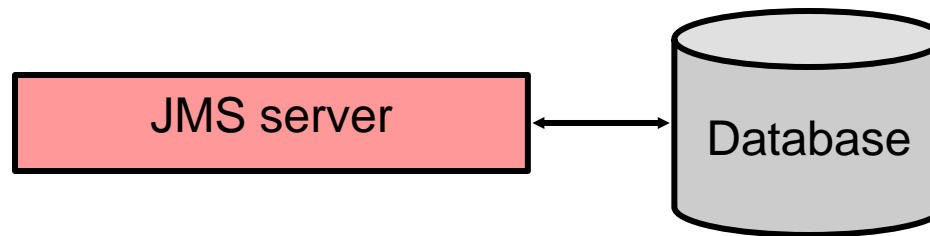


Creating a JMS Store

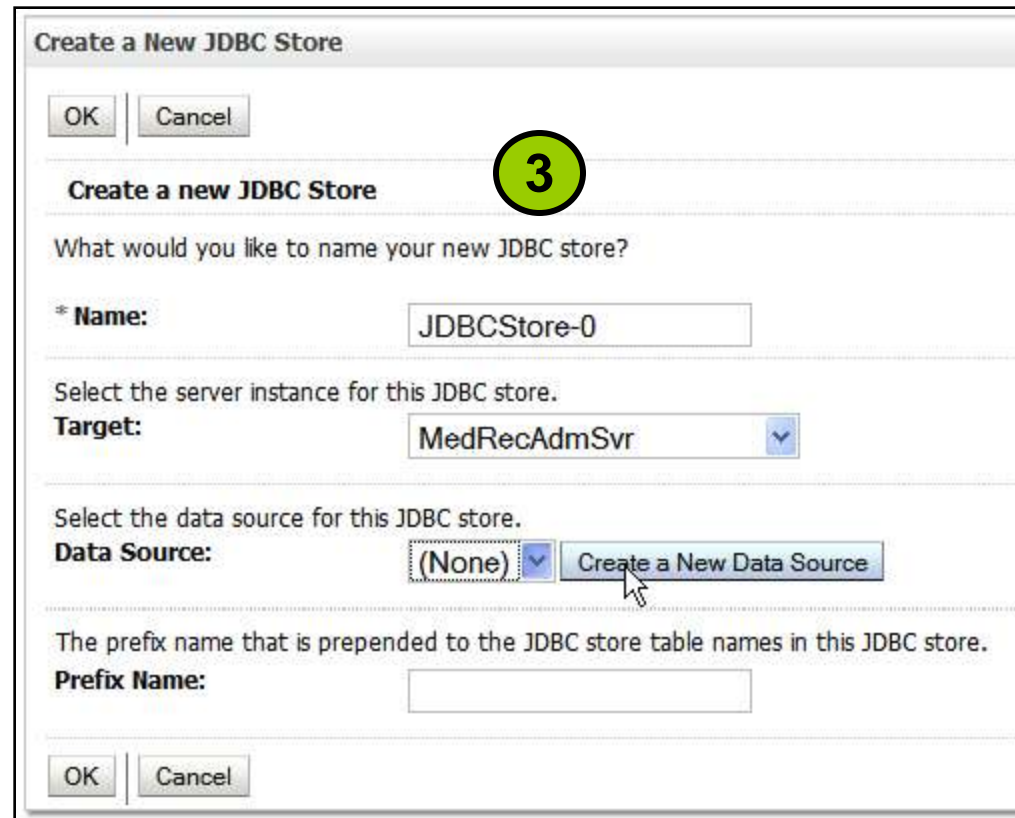
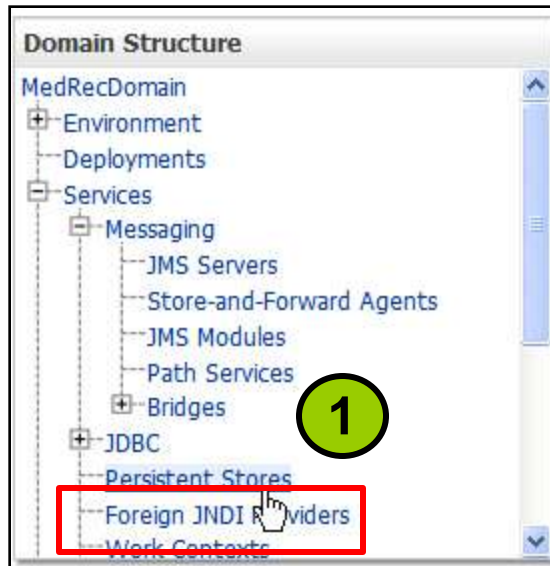


Creating a JDBC Store for JMS

- You can create a persistent store to a database using JDBC Store.
- To configure JMS JDBC persistence, perform the following:
 - Create a JDBC DataSource.
 - Create a JDBC Store and refer to the JDBC DataSource.
 - Refer to the JMS store from the JMS server configuration.
- The required infrastructure (tables and so on) is created automatically using Data Definition Language (DDL).



Creating a JMS JDBC Store



Assigning a Store to a JMS Server

The screenshot displays the Oracle JMS Server configuration interface. On the left, the 'Domain Structure' tree shows the hierarchy: MedRecDomain > Environment > Deployments > Services > Messaging > JMS Servers. The 'JMS Servers' node is highlighted with a red rectangle and a green circle with the number 1. On the right, the 'Settings for HRJMSServer' panel is shown. It has tabs for Configuration, Logging, Targets, Monitoring, Control, and Notes. The 'Configuration' tab is active, and the 'General' sub-tab is selected. A 'Save' button is present. Below the tabs, there is a text area explaining that JMS servers act as management containers for queues and topics, and that their primary purpose is to maintain information on what persistent store is used to maintain the states of durable subscribers. Below this, the 'Name' field is set to 'HRJMSServer'. The 'Persistent Store' field is set to '(none)', and a dropdown menu is open, showing the option 'HRFS' selected with a green circle and the number 2. At the top left, a message states: 'Pending changes exist. They must be activated to take effect.' with buttons for 'Activate Changes' and 'Undo All Changes'.

Pending changes exist. They must be activated to take effect.

Activate Changes

Undo All Changes

Domain Structure

- MedRecDomain
 - Environment
 - Deployments
 - Services
 - Messaging
 - JMS Servers**
 - Store-and-Forward Agents
 - JMS Modules
 - Path Services
 - Bridges
 - JDBC
 - Persistent Stores
 - Foreign JNDI Providers
 - Work Contexts

Settings for HRJMSServer

Configuration | Logging | Targets | Monitoring | Control | Notes

General | Thresholds and Quotas | Session Pools

Save

JMS servers act as management containers for the queues and topics in JMS. The primary purpose for its destinations is to maintain information on what persistent store is used to maintain the states of durable subscribers created on the destinations.

Use this page to define the general configuration parameters for this JMS Server.

Name: HRJMSServer

Persistent Store: (none) (none) **HRFS**

Persistent Connection Factory

Settings for HRCF

Configuration

Subdeployment

Notes

General

Default Delivery

Client

Transactions

Flow Control

Load Balance

Security

Save

Use this page to define the default delivery configuration parameters for this JMS connection factory, time to live, etc.

Default Priority:

4

Default Time-to-Live:

0

Default Time-to-Deliver:

0

Default Delivery Mode:

Persistent

Default Redelivery Delay:

0

Default Compression Threshold:

2147483647

Send Timeout:

10

Configuring Destination Overrides

Priority Override:	<input type="text" value="-1"/>
Time-to-Live Override:	<input type="text" value="-1"/>
Time-to-Deliver Override:	<input type="text" value="-1"/>
Delivery Mode Override:	<input type="text" value="No-Delivery"/>

Road Map

- Oracle WebLogic Server JMS administration
- Configuring JMS objects
- Durable subscribers and persistent messaging
- **Monitoring JMS**
 - Monitoring JMS servers
 - Monitoring JMS modules



Monitoring JMS Servers


Statistics are provided for the following JMS objects:

- JMS servers
- Connections
- Destinations

[Customize this table](#)

Statistics(Filtered - More Columns Exist)

Showing 1 to 1 of 1 Previous | Next

<input type="checkbox"/>	Name 	Messages Current	Messages High	Bytes Current	Session Pools Current
<input type="checkbox"/>	PayrollJMSServer	3	3	36	0

Monitoring and Managing Destinations

Settings for examplesServer.jms

Configuration Logging Targets **Monitoring** Control Notes

Monitoring **Active Destinations** Active Transactions Active Connections Active Session Pools

This page allows you to view active destinations targeted to this JMS server.

[Customize this table](#)

Destinations

Production Consumption Insertion

Showing 1 - 4 of 4 Previous | Next

<input type="checkbox"/>	Name	Messages Current	Messages Pending	Messages High	Messages Received	Messages Threshold	DestinationType	State	Production Paused	Insertion Paused	Consumption Paused
<input type="checkbox"/>	examples-jms/exampleQueue	0	0	0	0	0	0	advertised_in_local_jndi	false	false	false
<input type="checkbox"/>	examples-jms/exampleTopic	0	0	0	0	0	0	advertised_in_local_jndi	false	false	false
<input type="checkbox"/>	examples-jms/jms/MULTIDATASOURCE_MDB_QUEUE	0	0	0	0	0	0	advertised_in_local_jndi	false	false	false
<input type="checkbox"/>	examples-jms/quotes	0	0	0	0	0	0	advertised_in_cluster_jndi	false	false	false

Production Consumption Insertion

Showing 1 - 4 of 4 Previous | Next

You can suspend or resume message production and consumption.

Monitoring Queues

- In the Administration console, navigate to Services > Messaging > JMS Modules.
- In the JMS Modules table, click the JMS module you have created.
- In the Summary of Resources table, click the link to your queue, and then click the Monitoring tab.
- The Messages High and Messages Total columns show nonzero values indicating that messages have been received.

Destinations(Filtered - More Columns Exist)						
<input type="button" value="Show Messages"/>		Showing 1 to 1 of 1 Previous Next				
<input type="checkbox"/>	Name ^	Consumers Current	Consumers High	Consumers Total	Messages High	Messages Total
<input type="checkbox"/>	dizzyworldModule!dizzyworldQueue	0	0	0	1	1
<input type="button" value="Show Messages"/>		Showing 1 to 1 of 1 Previous Next				

Viewing Active Queues and Topics

In the Administration Console, navigate to the JMS Modules and click the Active Destinations tab.

Settings for examplesServer.jms

Configuration Logging Targets Monitoring Control Notes

Monitoring **Active Destinations** Active Transactions Active Connections Active Session Pools

This page allows you to view active destinations targeted to this JMS server.

[Customize this table](#)

Destinations

Production Consumption Insertion

<input type="checkbox"/>	Name	Messages Current	Messages Pending	Messages High	Messages Received	Messages Threshold	DestinationType	State	Production Paused	Insertion Paused	Consumption Paused
<input type="checkbox"/>	examples-jms!exampleQueue	0	0	0	0	0	0	advertised_in_local_jndi	false	false	false
<input type="checkbox"/>	examples-jms!exampleTopic	0	0	0	0	0	0	advertised_in_local_jndi	false	false	false
<input type="checkbox"/>	examples-jms!jms/MULTIDATASOURCE_MDB_QUEUE	0	0	0	0	0	0	advertised_in_local_jndi	false	false	false
<input type="checkbox"/>	examples-jms!quotes	0	0	0	0	0	0	advertised_in_cluster_jndi	false	false	false

Production Consumption Insertion

Showing 1 - 4 of 4 Previous | Next

Managing Messages in a Queue

- You can enable messages to be viewed in the Administration Console.
- After they are enabled, you can view and manage the messages in a queue using the Administration Console.

Settings for HRQueue

Configuration **Monitoring** Cont...

A JMS destination identifies a queue...

This page summarizes the active JM...

[Customize this table](#)

Destinations(Filtered - More Colu...

[Show Messages](#)

<input checked="" type="checkbox"/>	Name ^	Messages Current	Messages Pending	Messages Total	Consumers Current
<input checked="" type="checkbox"/>	HRModule!HRQueue	2	0	0	0

[Show Messages](#)

Customize this table

JMS Messages(Filtered - More Columns Exist)

New Delete ▾ Move ▾ Import Export ▾

<input type="checkbox"/>	ID ^	CorrId	Time Stamp
<input type="checkbox"/>	ID:<28135.1238368149351.0>		Sun Mar 29 19:09:09 EDT 2009
<input type="checkbox"/>	ID:<28135.1238368149351.0>		Sun Mar 29 19:09:09 EDT 2009

New Delete ▾ Move ▾ Import Export ▾

Quiz

Which are the correct messaging model and JMS destination type associations?

1. Queue: Publish/Subscribe
2. Queue: Point-to-Point
3. Topic: Publish/Subscribe
4. Topic: Point-to-Point

Quiz

Which are the available resource types within an Oracle WebLogic Server JMS module?

1. Connection factory
2. Queue
3. Topic
4. Server
5. Store

Summary

In this lesson, you should have learned how to:

- Describe how Oracle WebLogic Server JMS is implemented
- Configure JMS server
- Configure connection factories
- Configure queues and topics
- Configure persistent messages
- Monitor JMS resources and messages

Practice Overview:

Configuring JMS Resources

This practice covers the following topics:

- Configuring JMS resources such as:
 - JMS server, JMS module, queue, and topic
- Posting messages to the queue and topic
- Monitoring a queue in the Administration Console