Module 8



Setting Up JMS (Java Message Service) Applications

At the end of this module, you will be able to:

- ✓ Understand how WebLogic Server JMS is implemented
- ✓ Configure JMS administered objects using the administration console
- ✓ Configure persistent messages
- ✓ Use the WLS administration console to monitor JMS

Road Map



1. WebLogic Server JMS Administration

- Messaging Fundamentals
- Point-to-Point (PTP) and Publish-Subscribe (Pub/sub) domains
- Configuring JMS Objects
- Fine-Tuning WLS JMS
- 2. Configuring Persistent Messaging
- 3. Monitoring JMS in WLS

Message-Oriented Middleware

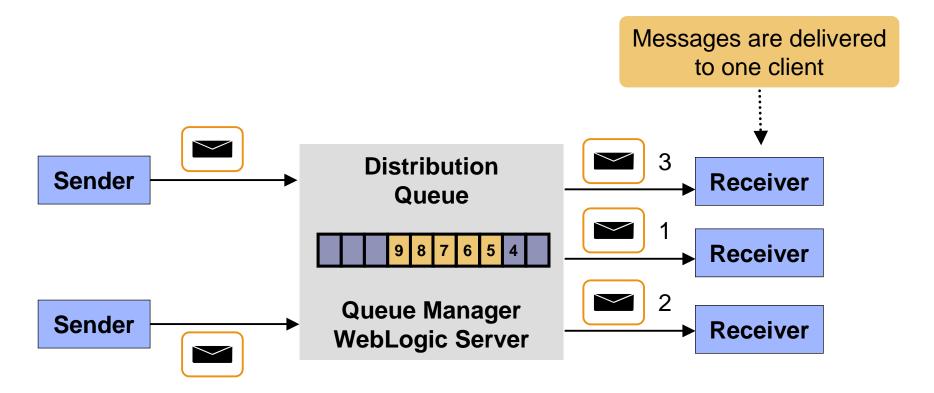


- ► *Message-oriented middleware* refers to an infrastructure that supports messaging.
- ► Typical message-oriented middleware architectures define these elements:
 - Message structure
 - The way to send and receive messages
 - Scaling guidelines

Point-to-Point (PTP) Queue



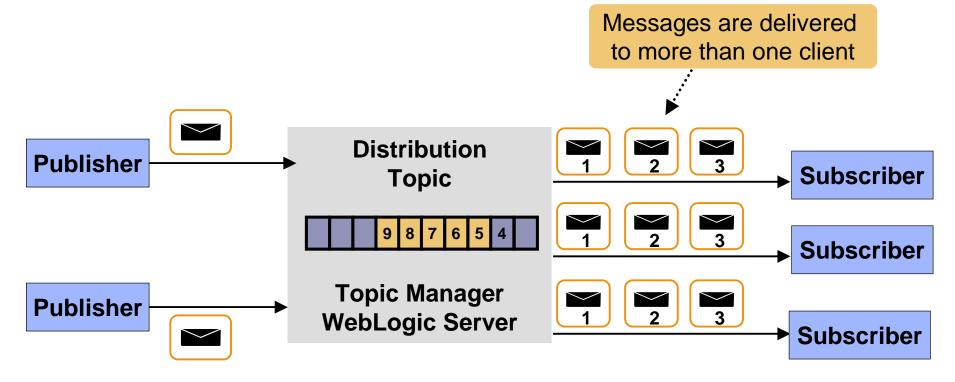
Many producers can *serialize* messages to multiple receivers in a *queue*.



Publish-Subscribe Topics



▶ Publishing and subscribing to a *topic* decouples producers from consumers.



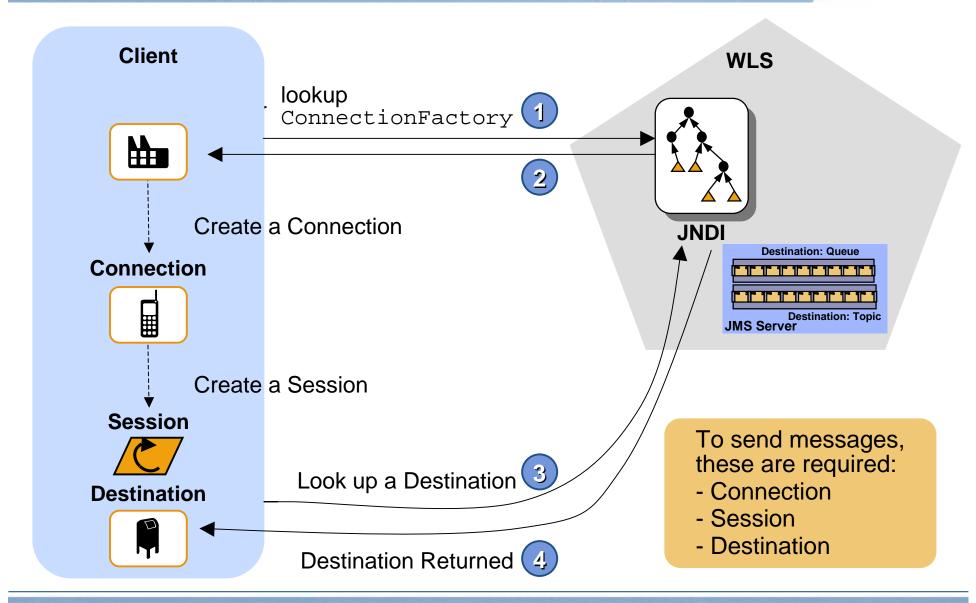
WebLogic Server JMS Features



- ► WebLogic Server JMS supports:
 - PTP and Pub/sub domains
 - Guaranteed and transactional message delivery
 - Durable subscribers
 - Distributed destinations
 - Recovery from failed servers

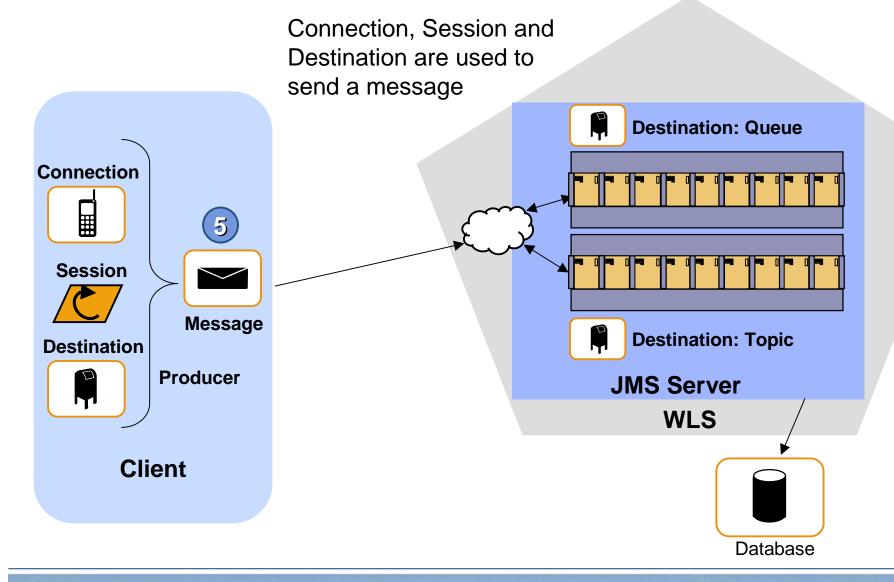
JMS Architecture: Connecting





JMS Architecture: Sending Messages

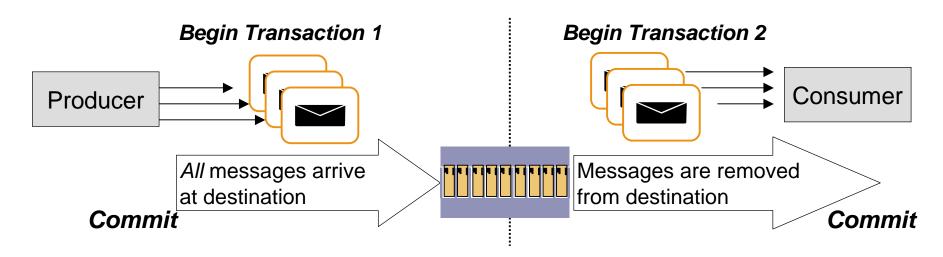




Transacted Messaging



- ▶ A JMS client can use JTA to participate in a distributed transaction.
- ► Alternatively, a JMS client can demarcate transactions local to the JMS Session, through a transacted session.
- ▶ Participation in a transaction is optional.



Administrative Tasks

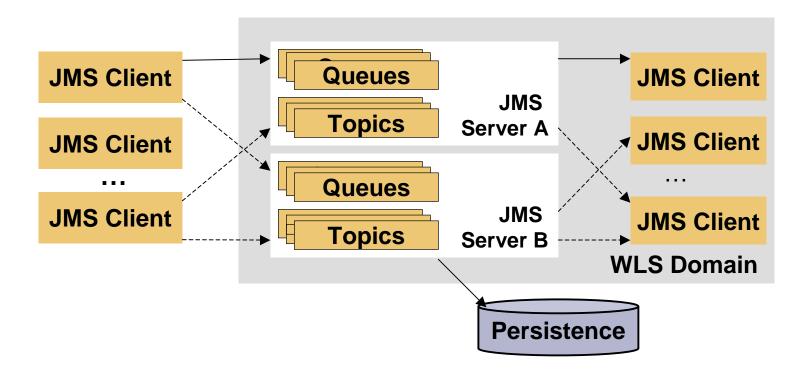


- ► Administrative tasks include these:
 - Creating and monitoring JMS Servers
 - Creating connection factories
 - Creating and monitoring destinations
 - Creating JMS stores
 - Configuring thresholds and quotas
 - Configuring durable subscriptions
 - Managing JMS service fail-over

WLS JMS Server



- ▶ In WLS, the messaging service is implemented through a JMS Server.
- ► A JMS Server receives and distributes messages.



Create a JMS Server



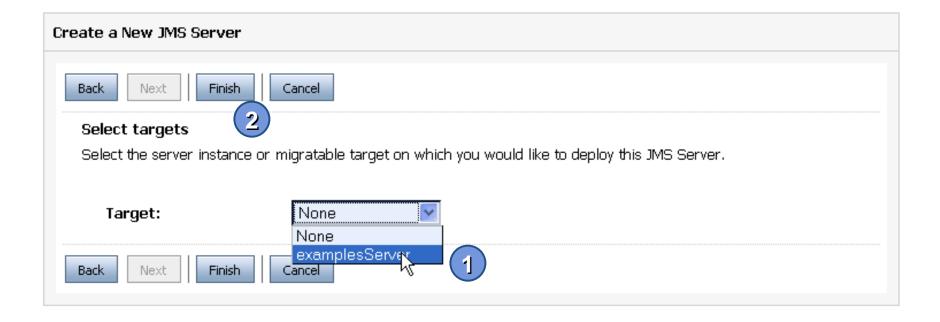






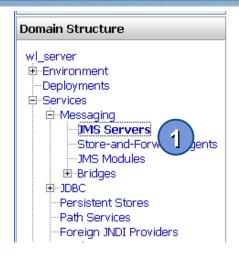
Target a JMS Server





Configure a JMS Server







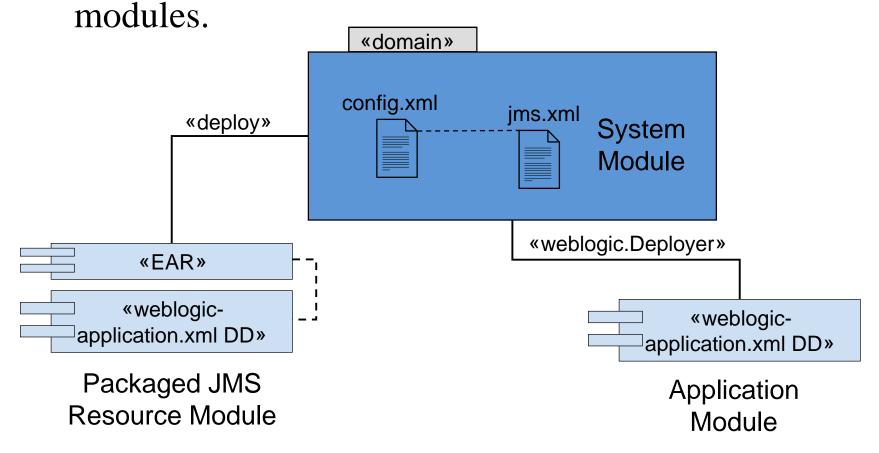




JMS Resources



► JMS resources are managed as system modules, application modules, or packaged JDBC resource



Modular JMS Resource Configuration and Deployment...



- ► JMS configurations in WebLogic Server are stored as modules
 - Defined by an XML file that conforms to the weblogicjmsmd.xsd schema
 - Similar to standard J2EE modules
- An administrator can create and manage JMS modules as:
 - Global system resources
 - Global standalone modules
 - Modules packaged with an enterprise application

...Modular JMS Resource Configuration and Deployment



- ► An advantage of modular deployment is simplified migration 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

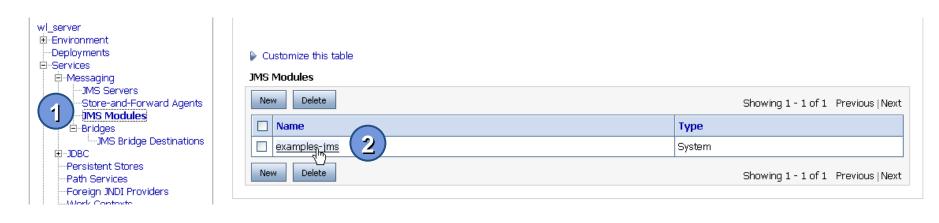
Connection Factory



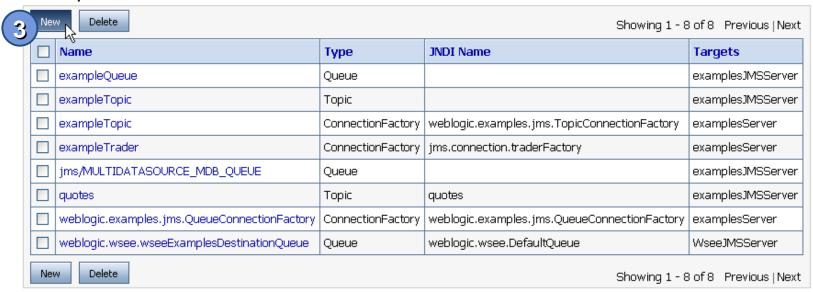
- ► A connection factory:
 - Encapsulates connection configuration information
 - Is used to create pre-configured connections
 - Is stored in JNDI
 - Can be targeted to servers or clusters
- ▶ WLS provides a default connection factory that is bound in JNDI to weblogic.jms.ConnectionFactory.
- ▶ When a new configuration is required, a new connection factory can be created.

Create a Connection Factory...



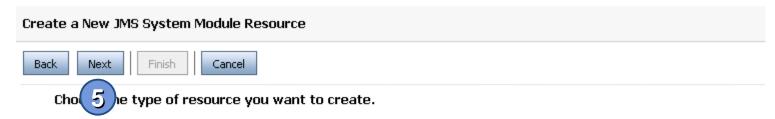


Summary of Resources



... Create a Connection Factory...





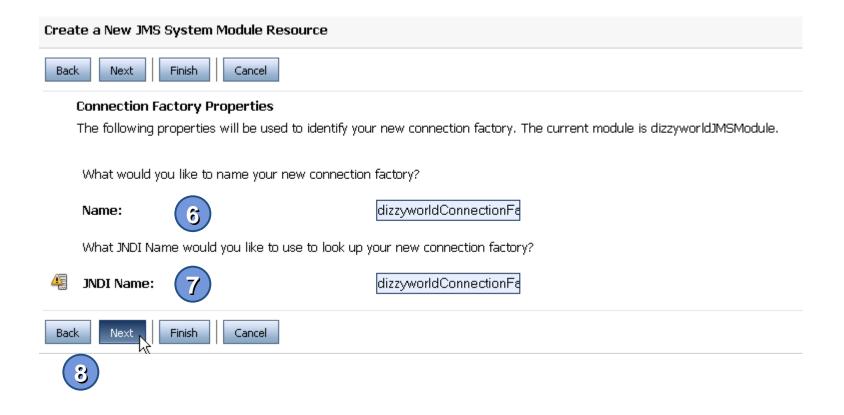
Use these pages to create resources in a JMS system module, such as queues, topics, templates, and connection factories.

Depending on the type of resource you select, you are prompted to enter basic information for creating the resource. For tar topics, foreign servers, and JMS SAF destinations, you can also proceed to targeting pages for selecting appropriate server to mechanism for grouping JMS module resources and the members to server resources.



... Create a Connection Factory...





... Create a Connection Factory...



Create a New JMS System Module Resource
Back Next Finish Advanced Targeting Cancel
The following properties will be used to target your new JMS system module resource
Use this page to view and accept the default targets where this JMS resource will be targeted. The default targets are based on Advanced Targeting to use the subdeployment mechanism for targeting this resource.
The following JMS module targets will be used as the default targets for your new JMS system module resource. If the module
Targets: Servers ✓ dizzy1
Back Next Finish Advanced Targeting Cancel

... Create a Connection Factory

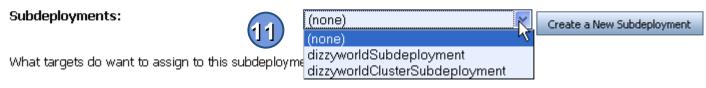


Create a New JMS System Module Resource Back Next Finish Cancel

The following properties will be used to target your new JMS system module resource

Use this page to select a subdeployment to assign this system module resource. A subdeployment is a mechanism by which I can create a new subdeployment by clicking the **Create a New Subdeployment** button. You can also reconfigure subdeployment

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



Targets:

Configure Connection Factory: Default Delivery



Configuration	Subdeployment	Notes					
General [Default Delivery	Client Transact	tions Flow Control	Load	Balance	Security	
Save							
Use this page to define the default delivery configuration parameters for this JMS connection factory, such as the default delivery							
Default	Priority:		4		The defa	ult priority used for me	ssages when a priorit
Default	Time-to-Live:		0			imum length of time, in es that the message ha	
Default	Time-to-Deliver:		0		The delay	y time, in milliseconds,	between when a mes
Default	Delivery Mode:		Persistent	~	The defa	ult delivery mode used	for messages when a
Default	Compression Thr	eshold:	2147483647			ber of bytes for the ser by the JMS message pr	
Send Tir	meout:		10			imum length of time, in age being sent. <mark>More I</mark> r	
🚑 Default	Unit-of-Order fo	r Producer:	None	~		ult Unit-of-Order name en among multiple reci	
4 User-ge	enerated Unit-of-	Order Name:			Specifies	the Unit-of-Order nam	e when the Default Ur

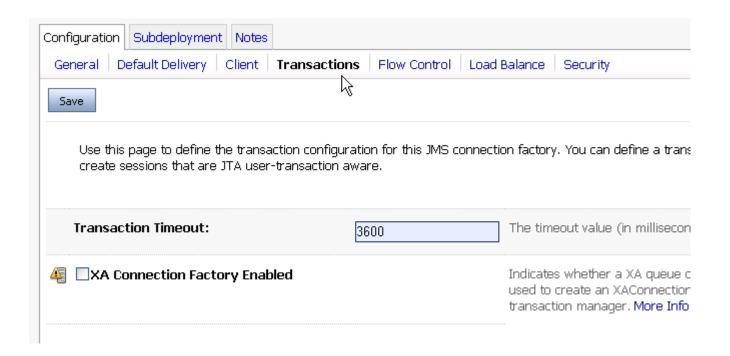
Configure Connection Factory: Client



Configuration Subdeployment Notes		
General Default Delivery Client T	Transactions Flow Control Lo	pad Balance Security
Save		
Use this page to define the client cor	nfiguration parameters for this JN	/IS connection factory, such as client id for dur
Client ID for Durable Subscribers:	:	An optional client ID for a durable su one JMS client from using a connecti
☑Allow Close() Within onMessag	je()	Specifies whether the connection fac More Info
Client Acknowledge Policy:	All 💌	Acknowledge policy for non-transact acknowledges all unacknowledged m unacknowledged messages up to, ar
Maximum Messages per Session:	10	The maximum number of messages Synchronous Prefetch Mode is enabl server access. More Info
Prefetch Mode for Synchronous Consumer:	Disabled	Specifies whether a synchronous cor Info
Multicast Overrun Policy:	Keep Old 💌	The policy to use when the number of discarded. More Info

Configure Connection Factory: Transactions





Configure Connection Factory: Flow Control



Configuration Subdeployment Notes				
General Default Delivery Client	Transactions	Flow Control	Load Balance	Security
Save		ß		
Flow control allows you to enable a JMS server or destination to slow down message producers when it deteri messages thresholds, it instructs producers to limit their message flow (messages per second). Use this page allows to define the flow control configuration for this JMS connection factory.				
Flow Maximum:	E	500		ximum number of message: er be allowed to go faster th
Flow Minimum:	E	i0		nimum number of messages er's flow limit. That is, WebL
Flow Interval:	Ε	;0		ustment period of time, in s versa. More Info
Flow Steps:	[1	0	versa. S	mber of steps used when a p Specifically, the Flow Interva o). More Info
☑Flow Control Enabled				s whether a producer creat ver or a destination reaches

Destination



- ▶ A *destination* is a lightweight object stored in JNDI.
- ▶ It is the target on a JMS Server for sending or receiving messages.
- ► The JMS destination types are:
 - Queue
 - Topic

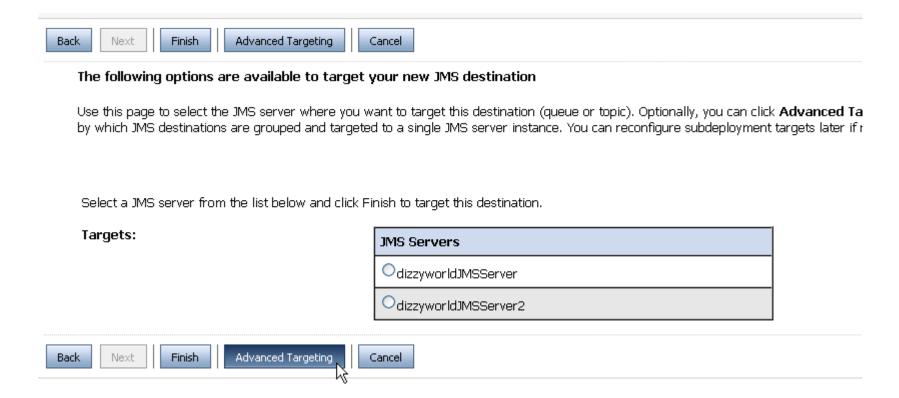
Create a Queue Destination...



Create a New JMS System Module Resource					
Back Next Finish Cancel					
JMS Destination Properties					
The following properties will be used to identify your new Queue. The current module is dizzyworldJMSModule.					
Name:	dizzyworldQueue				
JNDI Name:	dizzyworldQueue				
Template:	None 🕶				
Back Next Finish Cancel					

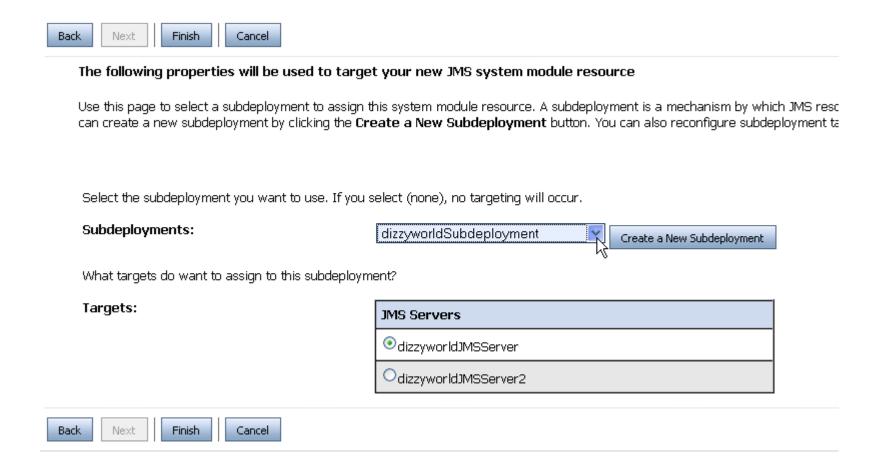
... Create a Queue Destination...





... Create a Queue Destination





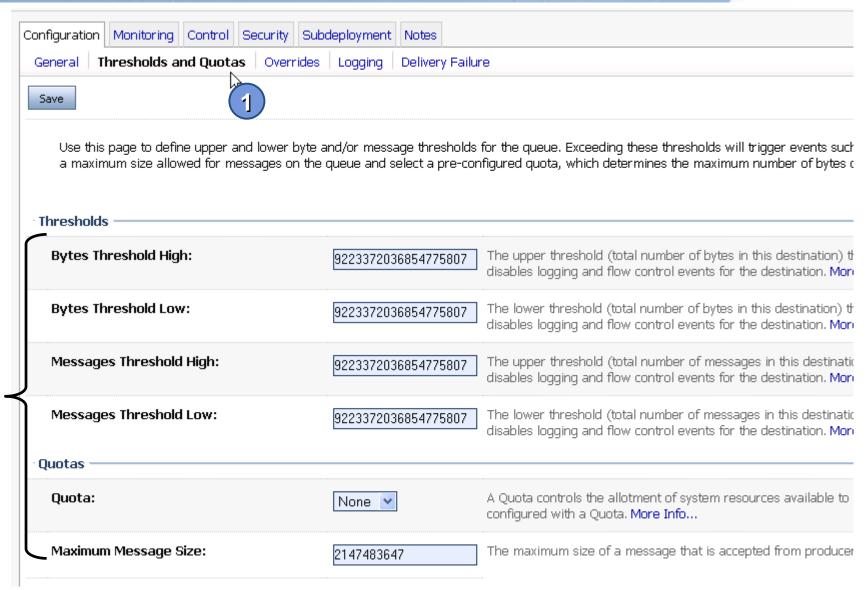
Threshold and Quota



- ► A *threshold* and a *quota* can be set for Server and Destination objects.
- ► A quota is a limit defined for JMS administered objects; it includes these values:
 - The maximum number of bytes that can be stored
 - The maximum number of messages that can be stored
- ► A threshold is a limit that triggers message paging, flow control, and logged warnings, using:
 - Upper and lower values for the number of bytes
 - Upper and lower values for the number of messages

Configuring Thresholds and Quotas





Section Review



In this section, we learned how to:

- ✓ Identify message-oriented middleware domains (PTP, publish and subscribe)
- ✓ Understand WLS JMS messaging for the PTP and publish and subscribe domains
- ✓ Administer JMS from the console
- ✓ Fine-tune WLS JMS with thresholds and quotas



Road Map



1. WebLogic Server JMS Administration

2. Configuring Persistent Messaging

- Persistent and Non-Persistent Messages
- Persistent Backing Stores Using the Console
- Durable Subscriptions
- Durable Subscriptions Using the Console
- 3. Monitoring JMS in WLS

Durable Subscribers and Subscriptions



- ▶ Durable subscribers register durable subscriptions to guarantee message delivery even if subscribers are *inactive*.
- ► A subscriber is considered *active* if the Java object that represents it exists.
- ▶ By default, subscribers are non-durable.
- ► Administrators configure:
 - Where messages are persisted
 - Persistent connection factories and destinations

When to Use Persistent Messaging

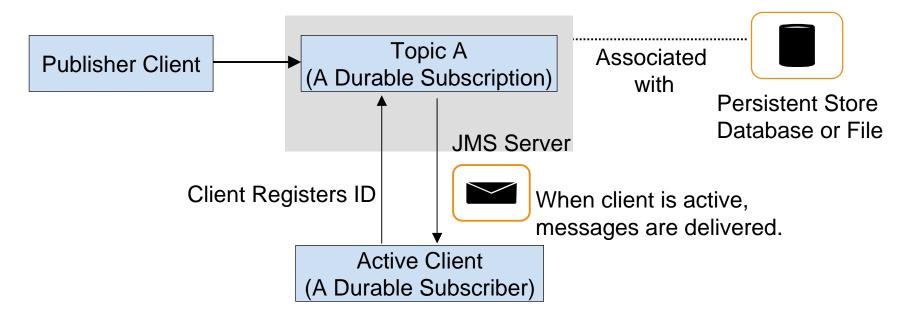


- ▶ Persistent messaging permits messages in memory to be written out to a persistent store.
- ► Configure persistent messaging if:
 - Development requires durable subscriptions (use durable subscribers in the application)
 - You require that in-progress messages persist across server restarts

How a Durable Subscription Works



▶ If a subscriber client is active, messages are delivered normally:



▶ When the client becomes active again, its ID is used to retrieve and redeliver messages.

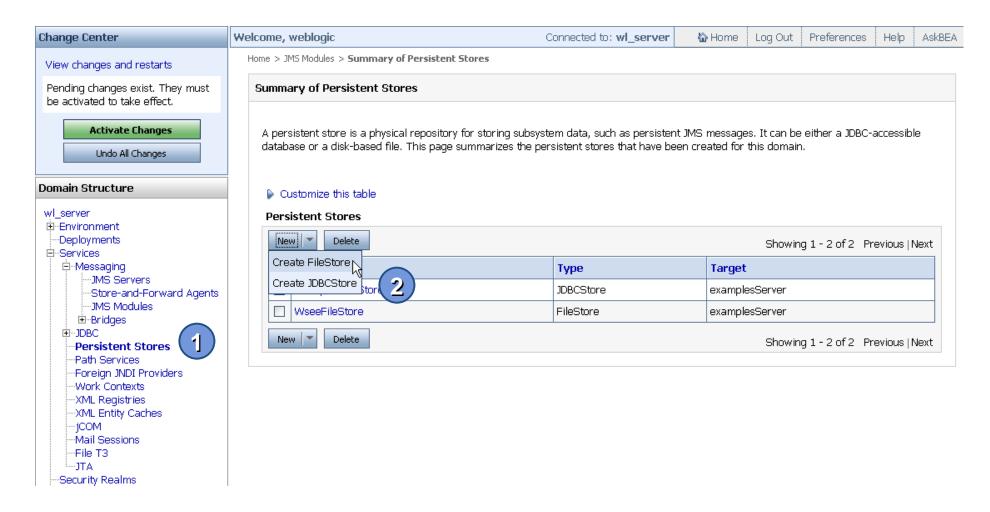
Configure a Durable Subscription



- ► 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:
 - A file store
 - A JDBC store (a connection pool)

Create a JMS File Store...





... Create a JMS File Store



Create a New File Store	
Back Next Finish Cancel	
File Store Properties	
The following properties will be used to identify you	ur new file store.
What would you like to name your new file store?	
Name:	dizzyworldFileStore
Select a server instance for this file store.	
Target:	dizzy1 💌
The pathname to the directory on the file system v	where the file store is kept. This directory must exist on your system, so be sure to create it before
Directory:	c:\JMSServerRepository
Back Next Finist Cancel	

Create a JMS JDBC Store...



- ► To configure JMS JDBC persistence:
 - Create a JDBC DataSource.
 - Create a JMS 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.

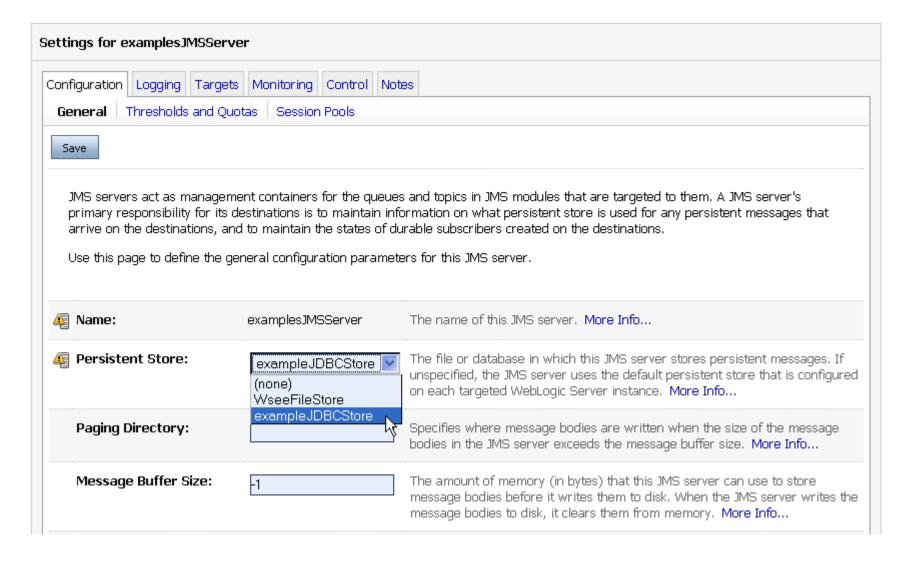
... Create a JMS JDBC Store



Back Next Finish Cancel				
Create a new JDBC Store The following properties will be used to identify your new JDBC store.				
What would you like to name your new JDBC store?				
Name:	dizzyworldJDBCStore			
Select the server instance for this JDBC store.				
Target:	dizzy1			
Select the data source for this JDBC store.				
Data Source:	dizzyworldDS Create a New Data Source			
The prefix name that is prepended to the JDBC store table names in this JDBC store.				
Prefix Name:	dizzy			
Back Next Finish Cancel				

Assign a Store to a JMS Server





Persistent Connection Factory



Configuration Subdeployment Notes		
General Default Delivery Client Transac	tions Flow Control Load	d Balance Security
Save		
Use this page to define the default delivery co	onfiguration parameters for t	this JMS connection factory, such as
Default Priority:	4	The default priority used for mess
Default Time-to-Live:	0	The maximum length of time, in r O indicates that the message has
Default Time-to-Deliver:	0	The delay time, in milliseconds, b
Default Delivery Mode:	Persistent Persistent	The default delivery mode used fo
Default Compression Threshold:	Non-Persistent टासरसठउठसर	The number of bytes for the seria received by the JMS message pro
Send Timeout:	10	The maximum length of time, in r the message being sent. More Inf
Default Unit-of-Order for Producer:	None	The default Unit-of-Order name fo order, even among multiple recip

Configure a Persistent Destination



Configuration Monitoring Control Security Su	bdeployment Notes	
General Thresholds and Quotas Overrides	Logging Delivery Failur	е
Save		
Destinations can override some of the setting	s (such as priority) that a m	essage producer includes with its messages. Use this p
Priority Override:	-1	The priority assigned to all messages that arrive at the specifies that the destination will not override the Priority
Time-to-Live Override:	-1	The time-to-live assigned to all messages that arrive value (-1) specifies that this setting will not override
Time-to-Deliver Override:	-1	The default delay, either in milliseconds or as a scheregardless of the delivery time specified by the producer a schedule. More Info
Delivery Mode Override:	Persistent No-Delivery Persistent Non-Persistent	The delivery mode assigned to all messages that arri

Section Review



In this section, we learned how to:

- ✓ Distinguish between persistent and non-persistent messages
- ✓ Configure persistent backing stores using the console
- Manage durable subscriptions



Road Map



- 1. WebLogic Server JMS Administration
- 2. Configuring Persistent Messaging
- 3. Monitoring JMS in WLS
 - Using the Administration Console to Track JMS Statistics

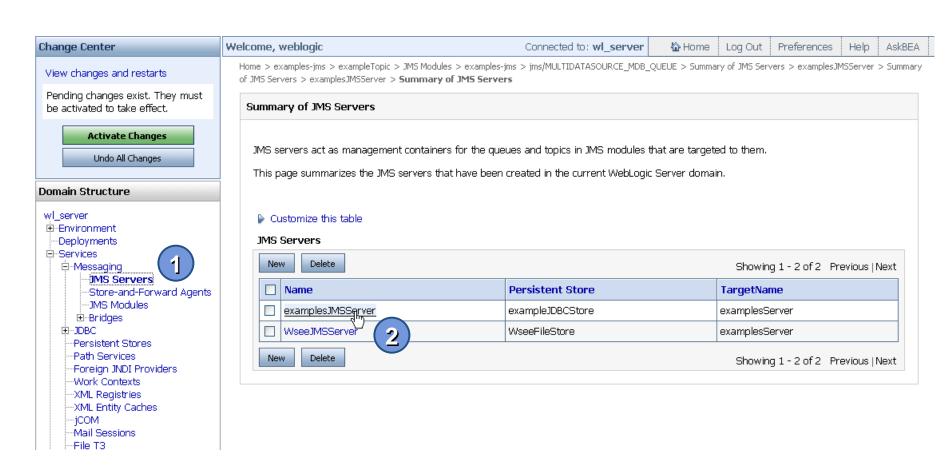
Statistics for JMS Objects



- ▶ Statistics are provided for the following JMS objects:
 - JMS servers
 - Connections
 - Destinations

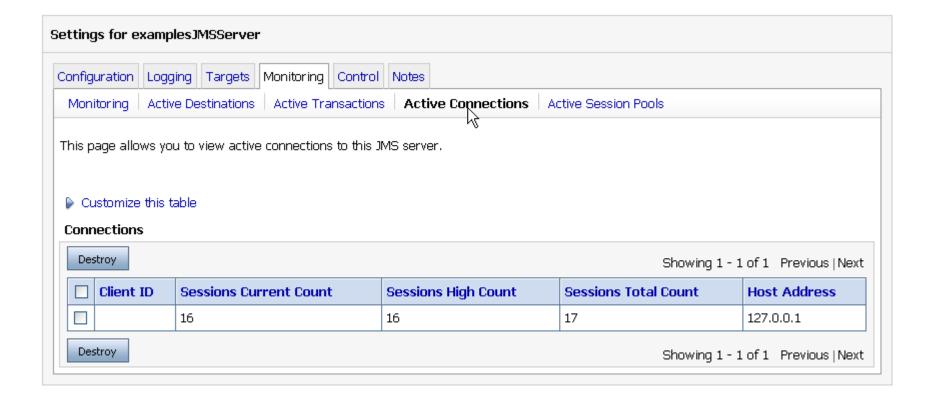
Monitor JMS Servers...





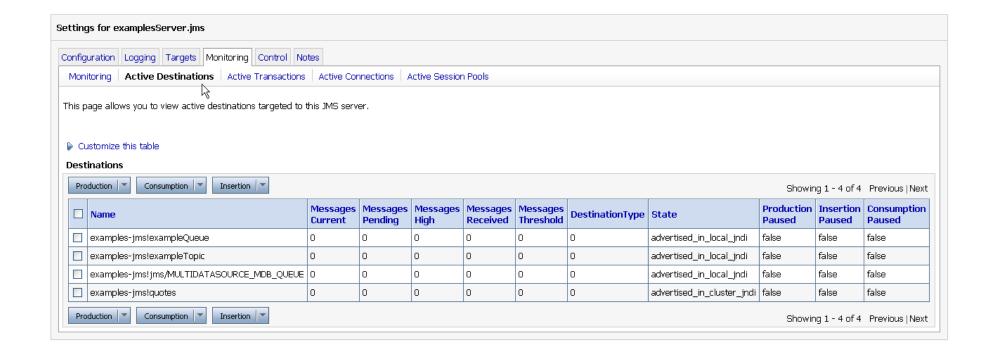
... Monitor JMS Servers





Monitor Destinations





Section Review



In this section, we learned how to:

✓ Use the administration console to display JMS statistics



Exercise



Configuring JMS Servers and Destinations

- ▶ For details on the exercise, refer to the Lab Guide.
- ▶ If questions arise, ask the instructor.
- ▶ The instructor will determine the stop time.



Module Review



In this section, we learned how to:

- ✓ Understand messaging concepts
- ✓ Understand WebLogic Server's JMS support
- ✓ Configure JMS servers, queues, and topics
- ✓ Monitor JMS servers, queues, and topics

