Oracle® Cloud

Using the Oracle Advanced Queuing (AQ) JMS Adapter with Oracle Integration 3

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About This Content

This guide describes how to configure this adapter as a connection in an integration in Oracle Integration.

Audience

This guide is intended for developers who want to use this adapter in integrations in Oracle Integration.

Documentation Accessibility

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Related Resources

See these Oracle resources:

- Oracle Cloud at `http://cloud.oracle.com`
- *Using Integrations in Oracle Integration 3*
- *Using the Oracle Mapper with Oracle Integration 3*
- Oracle Integration documentation on the Oracle Help Center.

Conventions

The following text conventions are used in this document.

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

1

Understand the Oracle Advanced Queuing (AQ) JMS Adapter

Review the following topics to learn about the Oracle Advanced Queuing (AQ) JMS Adapter and how to use it as a connection in integrations in Oracle Integration. A typical workflow of adapter and integration tasks is also provided.

Topics:

Oracle Advanced Queuing (AQ) JMS Adapter Capabilities

The Oracle Advanced Queuing (AQ) JMS (Java Messaging Service) Adapter enables you to integrate Oracle Advanced Queuing (AQ) in an on-premises application as well as cloud applications in an Oracle Database, Oracle Autonomous Transaction Processing (ATP) Database, Oracle Autonomous Data Warehouse (ADW) Database, and Oracle Database Classic Cloud Service (DBaaS) Database.

The Oracle Advanced Queuing (AQ) JMS Adapter provides the following capabilities:

- Allows messages to be enqueued in queues/topics.
- Allows messages to be dequeued from queues/topics.
- Supports messages of type text and byte.
- Allows you to specify a message structure for performing enqueue/dequeue operations. The supported message formats are:
  - Sample JSON
  - XML schema document/archive
  - Avro schema document
  - Sample XML document
- Allows you to define the order in which to consume messages from a queue or topic.
- Allows a message to be persistent/non-persistent.
- Allows you to define the time for which a message can stay on the channel (queue/topic) for consumption.
- Supports a durable subscriber using a topic.
- Allows a subscriber to filter the message by using a message selector.
- Allows you to choose the frequency at which to poll/consume messages.
- Supports connecting to the Oracle Database using a Single Client Access Name (SCAN).

- Supports the Username Password Token and Oracle Wallet security policies.

The Oracle Advanced Queuing (AQ) JMS Adapter is one of many predefined adapters included with Oracle Integration. See the Adapters page in the Oracle Help Center.

What Application Version Is Supported?

For information about which application version is supported by this adapter, see the Connectivity Certification Matrix.

Workflow to Create and Add an Oracle Advanced Queuing (AQ) JMS Adapter Connection to an Integration

You follow a very simple workflow to create a connection with an adapter and include the connection in an integration in Oracle Integration.

This table lists the workflow steps for both adapter tasks and overall integration tasks, and provides links to instructions for each step.

Step	Description	More Information
1	Decide where to work	• Work in a project (see why working with projects is preferred in *Using Integrations in Oracle Integration 3*). • Work outside a project.
2	Create the adapter connections for the applications you want to integrate. The connections can be reused in multiple integrations and are typically created by the administrator.	Create an Oracle Advanced Queuing (AQ) JMS Adapter Connection
3	Create the integration. When you do this, you add trigger (source) and invoke (target) connections to the integration.	Understand Integration Creation and Best Practices in *Using Integrations in Oracle Integration 3* and Add the Oracle Advanced Queuing (AQ) JMS Adapter Connection to an Integration
4	Map data between the trigger connection data structure and the invoke connection data structure.	Map Data in *Using Integrations in Oracle Integration 3*
5	(Optional) Create lookups that map the different values used by those applications to identify the same type of object (such as gender codes or country codes).	Manage Lookups in *Using Integrations in Oracle Integration 3*
6	Activate the integration.	Activate an Integration in *Using Integrations in Oracle Integration 3*
7	Monitor the integration on the dashboard.	Monitor Integrations During Runtime in *Using Integrations in Oracle Integration 3*
8	Track payload fields in messages during runtime.	Assign Business Identifiers for Tracking Fields in Messages and Track Integration Instances in *Using Integrations in Oracle Integration 3*
9	Manage errors at the integration level, connection level, or specific integration instance level.	Manage Errors in *Using Integrations in Oracle Integration 3*

2

Create an Oracle Advanced Queuing (AQ) JMS Adapter Connection

A connection is based on an adapter. You define connections to the specific cloud applications that you want to integrate.

Topics:

Prerequisites for Creating a Connection

You must satisfy the following prerequisites to create a connection with the Oracle Advanced Queuing (AQ) JMS Adapter. These prerequisites are required for both the Username Password Token and Oracle Wallet security policies.

- Know the Oracle Advanced Queueing (AQ) server host name or IP address and the port number.
- Know the Oracle system identifier (SID) or service name for the Oracle Advanced Queueing (AQ) server.
- Know the user name and password for the Oracle Advanced Queueing (AQ) server.

If you want to use the Oracle Wallet security policy, you need to perform these additional steps:

- Ensure that you download the Oracle wallet if you need to connect with the Oracle Autonomous Transaction Processing instance and Oracle Autonomous Data Warehouse instance. See Download the Client Credentials Wallet in *Using the Oracle Autonomous Data Warehouse Adapter with Oracle Integration 3*.
- Ensure that you create the Oracle wallet if you need to connect with the Oracle Database Cloud Service Adapter. You must satisfy the following requirements to create the Oracle wallet:
  - The Oracle Database Classic Cloud Service instance is accessible through a public IP address.
  - The Oracle Database Classic Cloud Service should be SSL-enabled along with the necessary wallet configuration. See the Oracle Database documentation for configuring secure sockets layer authentication for your respective database version. For example, for Release 18, see Configuring User Authentication with Secure Sockets Layer in *Oracle Database Security Guide*.
  - Once SSL is configured, the following files are available under the wallet directory:
    * `cwallet.sso`
    * `ewallet.p12`
  - Follow these steps to create a wallet archive file:

1. Generate the truststore and keystore using `orapki`:

   ```
   orapki wallet pkcs12_to_jks - wallet wallet_directory / ewallet.p12
   - pwd password_provided_during_wallet_creation - jksKeyStoreLoc
   wallet_directory / keystore.jks - jksKeyStorepwd password -
   jksTrustStoreLoc wallet_directory / truststore.jks -
   jksTrustStorepwd password
   ```

2. Create a ZIP file containing `cwallet.sso`, `ewallet.p12`, `keystore.jks`, and `truststore.jks`, including the `tnsnames.ora` file found in the `$ORACLE_HOME/network/admin/` directory.

- Ensure that you have the Oracle Wallet password.

Create a Connection

Before you can build an integration, you must create the connections to the applications with which you want to share data.

> **Note**
>
> You can also create a connection in the integration canvas. See Define Inbound Triggers, Outbound Invokes, and Actions.

To create a connection in Oracle Integration:

1. Decide where to start:
   - Work in a project (see why working with projects is preferred).
     a. In the navigation pane, click **Projects**.
     b. Select the project name.
     c. Click **Integrations**.
     d. In the **Connections** section, click **Add** if no connections currently exist or **+** if connections already exist. The Create connection panel opens.
   - Work outside a project.
     a. In the navigation pane, click **Design**, then **Connections**.
     b. Click **Create**. The Create connection panel opens.
2. Select the adapter to use for this connection. To find the adapter, scroll through the list, or enter a partial or full name in the **Search** field.
3. Enter the information that describes this connection.

Element	Description
Name	Enter a meaningful name to help others find your connection when they begin to create their own integrations.
Identifier	Automatically displays the name in capital letters that you entered in the **Name** field. If you modify the identifier name, don't include blank spaces (for example, `SALES OPPORTUNITY`).

Element	Description
Role	Select the role (direction) in which to use this connection. **Note**: *Only* the roles supported by the adapter you selected are displayed for selection. Some adapters support all role combinations (trigger, invoke, or trigger and invoke). Other adapters support fewer role combinations. When you select a role, only the connection properties and security policies appropriate to that role are displayed on the Connections page. If you select an adapter that supports both invoke and trigger, but select only one of those roles, you'll get an error when you try to drag the adapter into the section you didn't select. For example, assume you configure a connection for the Oracle Service Cloud (RightNow) Adapter as only an **invoke**. Dragging the adapter to a **trigger** section in the integration produces an error.
Keywords	Enter optional keywords (tags). You can search on the connection keywords on the Connections page.
Description	Enter an optional description of the connection.
Share with other projects	**Note**: This field only appears if you are creating a connection in a project. Select to make this connection publicly available in other projects. Connection sharing eliminates the need to create and maintain separate connections in different projects. When you configure an adapter connection in a different project, the **Use a shared connection** field is displayed at the top of the Connections page. If the connection you are configuring matches the same type and role as the publicly available connection, you can select that connection to reference (inherit) its resources. See Add and Share a Connection Across a Project.

4. Click **Create**.

   Your connection is created. You're now ready to configure the connection properties, security policies, and (for some connections) access type.

5. Follow the steps to configure a connection.
   The connection property and connection security values are specific to each adapter. Your connection may also require configuration with an access type such as a private endpoint or an agent group.

6. Test the connection.

Configure Connection Properties

Enter connection information so your application can process requests.

1. Go to the **Properties** section.

2. In the **Host** field, enter the host name for the Oracle Advanced Queueing (AQ) server.
3. In the **Port** field, enter the Oracle Advanced Queueing (AQ) server communications port number.
4. In the **SID** field, enter the Oracle system identifier (SID) for the Oracle Advanced Queueing (AQ) server. Alternatively, enter the logical representation of a service used for client connections in the **Service Name** field.

Configure Connection Security

Configure security for your Oracle Advanced Queuing (AQ) JMS Adapter connection.

1. Go to the **Security** section.
2. The **Security Policy** list, select the security policy:
   - **Username Password Token**
   - **Oracle Wallet**
3. If you select the **Username Password Token** security policy:
   a. In the **Username** field, enter the user name that you obtained after performing the prerequisite steps. See Prerequisites for Creating a Connection.
   b. In the **Password** field, enter the password that you obtained after performing the prerequisite steps. See Prerequisites for Creating a Connection.
4. If you select the **Oracle Wallet Security Policy**:
   a. In the **Wallet** field, click to upload the wallet file. See Prerequisites for Creating a Connection.

> **Note**
>
> The supported file format for the wallet file is `.zip`.

   b. In the **Wallet Password** field, enter the wallet password that you obtained after performing the prerequisite steps. See Prerequisites for Creating a Connection.
   c. In the **Username** field, enter the user name that you obtained after performing the prerequisite steps. See Prerequisites for Creating a Connection.
   d. In the **Password** field, enter the password that you obtained after performing the prerequisite steps. See Prerequisites for Creating a Connection.

Configure the Endpoint Access Type

Configure access to your endpoint. Depending on the capabilities of the adapter you are configuring, options may appear to configure access to the public internet, to a private endpoint, or to an on-premises service hosted behind a fire wall.

- Select the Endpoint Access Type
- Ensure Private Endpoint Configuration is Successful

Select the Endpoint Access Type

1. Go to the **Access type** section.
2. Select the option for accessing your endpoint.

Option	This Option Appears If Your Adapter Supports ...
Public gateway	Connections to endpoints using the public internet.
Private endpoint	Connections to endpoints using a private virtual cloud network (VCN). **Note**: To connect to private endpoints, you must complete prerequisite tasks in the Oracle Cloud Console. Failure to do so results in errors when testing the connection. See Connect to Private Resources in *Provisioning and Administering Oracle Integration 3* and Troubleshoot Private Endpoints in *Using Integrations in Oracle Integration 3*.
Connectivity agent	Connections to on-premises endpoints through the connectivity agent. a. Click **Associate agent group**. The Associate agent group panel appears. b. Select the agent group, and click **Use**. To configure an agent group, you must download and install the on-premises connectivity agent. See Download and Run the Connectivity Agent Installer and About Creating Hybrid Integrations Using Oracle Integration in *Using Integrations in Oracle Integration 3*.

Ensure Private Endpoint Configuration is Successful

- To connect to private endpoints, you must complete prerequisite tasks in the Oracle Cloud Console. Failure to do so results in errors when testing the connection. See Connect to Private Resources in *Provisioning and Administering Oracle Integration 3*.
- When configuring an adapter on the Connections page to connect to endpoints using a private network, specify the fully-qualified domain name (FQDN) and *not* the IP address. If you enter an IP address, validation fails when you click **Test**.

Test the Connection

Test your connection to ensure that it's configured successfully.

1. In the page title bar, click **Test**. What happens next depends on whether your adapter connection uses a Web Services Description Language (WSDL) file. Only some adapter connections use WSDLs.

If Your Connection...	Then...
Doesn't use a WSDL	The test starts automatically and validates the inputs you provided for the connection.

If Your Connection...	Then...
Uses a WSDL	A dialog prompts you to select the type of connection testing to perform: • **Validate and Test**: Performs a full validation of the WSDL, including processing of the imported schemas and WSDLs. Complete validation can take several minutes depending on the number of imported schemas and WSDLs. No requests are sent to the operations exposed in the WSDL. • **Test**: Connects to the WSDL URL and performs a syntax check on the WSDL. No requests are sent to the operations exposed in the WSDL.

2. Wait for a message about the results of the connection test.
   - If the test was successful, then the connection is configured properly.
   - If the test failed, then edit the configuration details you entered. Check for typos and verify URLs and credentials. Continue to test until the connection is successful.
3. When complete, click **Save**.

3

Add the Oracle Advanced Queuing (AQ) JMS Adapter Connection to an Integration

When you drag the Oracle Advanced Queuing (AQ) JMS Adapter into the trigger or invoke area of an integration, the Adapter Endpoint Configuration Wizard is invoked. This wizard guides you through configuration of the Oracle Advanced Queuing (AQ) JMS Adapter endpoint properties.

The following sections describe the wizard pages that guide you through configuration of the Oracle Advanced Queuing (AQ) JMS Adapter as a trigger or an invoke in an integration.

Topics:

Basic Info Page

Specify a name, description, business object, and action type on the Basic Info page of each invoke connection in your integration.

Element	Description
What do you want to call your endpoint?	Provide a meaningful name so that others can understand the responsibilities of this connection. You can include English alphabetic characters, numbers, underscores, and hyphens in the name. You can't include the following characters: • No blank spaces (for example, `My Inbound Connection`) • No special characters (for example, `#;83&` or `righ(t)now4`) except underscores and hyphens • No multibyte characters
What does this endpoint do?	Enter an optional description of the connection's responsibilities.
Destination Type	Select the destination type: • **Queue (Single Recipient Queue)** • **Topic (Multiple Recipient Queue)**

Trigger Dequeue Configurations Page

Select the database schema, topic, and subscriber to perform the dequeue operation.

Element	Description
Select Database Schema	Select the database schema for the dequeue operation.
Select Queue Name / Topic Name	Select the queue name/topic name for the dequeue operation.
Durable Subscriber (Is displayed only if you selected **Topic** on the Basic Info page and selected **Use only one agent at a time** when creating the agent group. See Create an Agent Group in *Using Integrations in Oracle Integration 3*.)	Select **Yes** or **No**.
Warning! Is displayed if you performed the following tasks: • Selected **Topic** on the Basic Info page • Selected **Public Gateway**, **Private Endpoint**, and **Connectivity Agent** for the access types when configuring the connection • Associated the **Connectivity Agent** selection with an agent group in which **Use only one agent at a time** is not selected	Only a durable subscription is available for this configuration. For a nondurable subscription, select **Use only one agent at a time** when creating the agent group that you associate with the connectivity agent.
Subscription Name Is displayed only if you performed the following tasks: • Selected **Topic** on the Basic Info page. • Selected **Use only one agent at a time** when creating the agent group and **Yes** for **Durable Subscriber**. • Did not select **Use only one agent at a time** when creating the agent group.	Enter the durable subscriber ID.
Message Selector	Select the pattern to use. After selecting a pattern, you can manually edit the value, if necessary. The pattern filters messages based on header and property information. The message selector rule is a boolean expression. If the expression is true, the message is consumed. If the expression is false, the message is rejected.
Polling frequency	Specify the value for the frequency (in seconds) at which to fetch records. The minimum value is `10` seconds and the maximum value is `300` seconds.
Do you want to specify the structure of the payload ? (Is displayed only if you selected **Text Message** as the **Message Type**.)	Select **Yes** to provide a payload structure. Otherwise, select **No**.

For information about configuring the connectivity agent, see Plan the Connectivity Agent Setup in *Using Integrations in Oracle Integration 3*.

Invoke Enqueue Configuration Page

Select the database, queue, and message format to perform the enqueue operation.

Element	Description
Select Database Schema	Select the database schema for the enqueue operation.
Select Queue Name / Topic Name	Select the queue name/topic name for the enqueue operation.
Message Type (Is displayed only if you select queues of type **AQ$_JMS_MESSAGE**.)	Select the message body type: • **Text Message**: Sends a message containing a `java.lang.String`. This message type transports text-based messages, including those with XML/JSON content. • **Bytes Message**: Sends a message containing a stream of uninterpreted bytes. This message type is for client encoding of existing message formats.
Delivery Mode	Specify the delivery mode. Two values are available: **Persistent** and **Nonpersistent**.
Message Priority (0-9)	Select the order in which to deliver messages: • **0** identifies the highest priority. • **9** identifies the lowest priority.
Time to live (Seconds)	Enter the duration (in seconds) for which you want your message to be available in the queue/topic for consumption.
Do you want to specify the structure of the payload ? (Is displayed only if you select **Text Message** as the **Message Type**.)	Select **Yes** to provide a payload structure. Otherwise, select **No**.

Message Structure Page

Select the enqueued message structure to use.

Element	Description
How would you like to specify the message structure?	Select the message structure to use from the list: • **Sample JSON Document** • **XML Schema (XSD) Document/Archive** • **Avro Schema (AVSC) Document** • **Sample XML Document** **Note:** • Drag and drop a message structure specified for the selected payload type. • Upon selecting **XML Schema (XSD) Document/Archive** as the message structure, the archive supports drag-and-drop functionality for ZIP files. All XSD schemas within the ZIP file appear in the **Schema Element** field as selectable options in a dropdown list.

Element	Description
Schema File	Displays the name of the sample XML/JSON file/ Avro schema/XSD file.
Schema Element	Displays the root element of the sample XML/JSON file/Avro schema/XSD file.

> **Note**
>
> This page appears only if you selected **Text Message** as the **Message Type** and you specified the payload structure on the previous wizard page. See Invoke Enqueue Configuration Page and Trigger Dequeue Configurations Page.

Headers Page

Select the standard headers to use or add a customized one.

Element	Description
JMS Standard Headers	Begin typing the name to filter the display of standard headers.
Available Headers	Select the standard headers to use from the list: • **Correlation ID** • **Delivery Mode** • **Type** • **Priority** • **Expiration** **Note**: If you are configuring the adapter as a trigger, you may find the following additional standard headers in the above list: • **MessageID** • **Redelivered** • **Timestamp**
Selected Headers	Displays the selected headers.
Custom JMS Header	Click **Add** and enter your custom JMS header, if required.

Summary Page

You can review the specified adapter configuration values on the Summary page.

Element	Description
Summary	Displays a summary of the configuration values you defined on previous pages of the wizard. The information that is displayed can vary by adapter. For some adapters, the selected business objects and operation name are displayed. For adapters for which a generated XSD file is provided, click the XSD link to view a read-only version of the file. To return to a previous page to update any values, click the appropriate tab in the left panel or click **Go back**. To cancel your configuration details, click **Cancel**.

4

Implement Common Patterns Using the Oracle Advanced Queuing (AQ) JMS Adapter

You can use the Oracle Advanced Queuing (AQ) JMS Adapter to implement the following common pattern.

Topics:

Create Customer Accounts in Shopify Using the Oracle Advanced Queuing (AQ) JMS Adapter

The Oracle Advanced Queuing (AQ) JMS Adapter enables message-based integrations using Oracle Advanced Queuing. A message with customer account data is published to an AQ JMS queue, which is then subscribed to by another integration using the Oracle Advanced Queuing (AQ) JMS Adapter (as a trigger) to create a customer account in the Shopify application.

This use case demonstrates how to use the Oracle Advanced Queuing (AQ) JMS Adapter in subscribe mode to receive customer data and integrate with Shopify for customer creation.

The following adapters and operations are used:

- Subscribe operation (Oracle Advanced Queuing (AQ) JMS Adapter trigger connection): Subscribes to an AQ JMS queue to receive the customer data message.
- Create Customer (Shopify Adapter invoke connection): Sends the received customer data to Shopify to create a new customer account.

This implementation pattern provides an overview of the steps.

Integration to Subscribe and Create a Shopify Customer

1. Create the Oracle Advanced Queuing (AQ) JMS Adapter trigger connection for subscribing.
2. Create the Shopify Adapter invoke connection.
3. Create an application integration in Oracle Integration.
4. Drag the Oracle Advanced Queuing (AQ) JMS Adapter into the integration as a trigger connection.
5. Configure the Oracle Advanced Queuing (AQ) JMS Adapter subscribing endpoint:
    a. On the Basic Info page, provide an endpoint name.
    b. Select the queue and specify the queue name to which the message was published.
    c. Define the expected message format (for example, JSON with customer data).
6. Drag the Shopify Adapter into the integration as an invoke connection.
7. Configure the Shopify Adapter create customer endpoint:

a. On the Basic Info page, provide an endpoint name.

b. Select the operation to create a customer account.

8. In the mapper, perform the required mappings from the AQ JMS message to the Shopify customer input.

9. Activate the integration.

Outcome

When a message with customer data is published to the AQ JMS queue, this integration subscribes to the message, extracts the customer information, and creates a new customer account in the Shopify application.

5

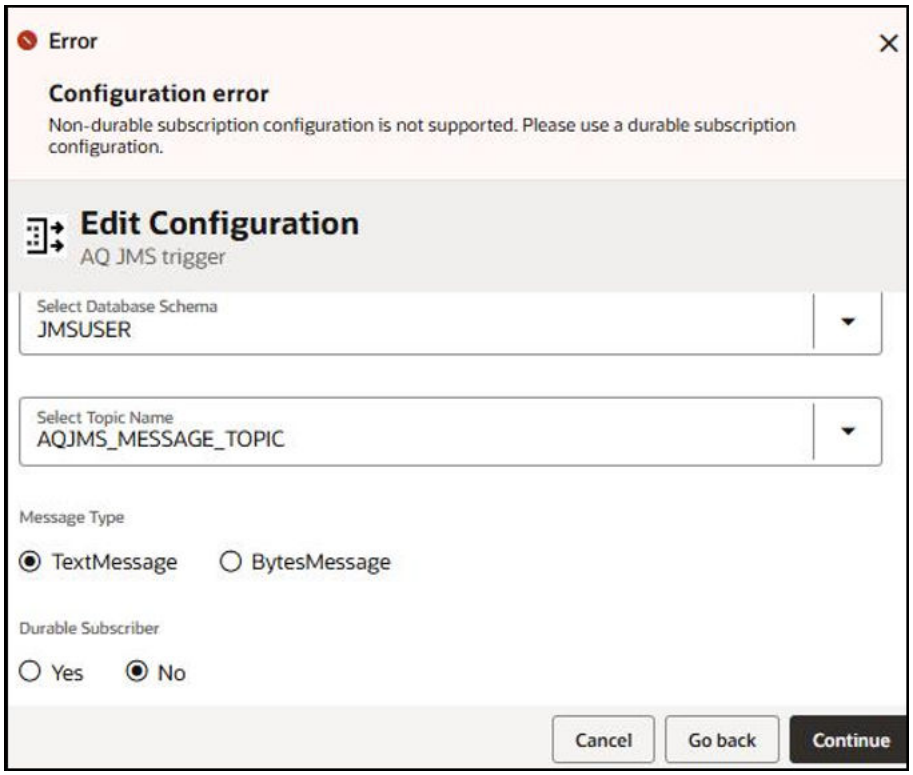
Troubleshoot the Oracle Advanced Queuing (AQ) JMS Adapter

Review the following topics to learn about troubleshooting issues with the Oracle Advanced Queuing (AQ) JMS Adapter.

Topics:

Configuration Error: Non-durable subscription configuration is not supported

You encounter the following error if you configured your subscriber as non-durable.



Solution: A simple resolution is to select **Yes** for the **Durable Subscriber** option on the Trigger Dequeue Configurations page. The Oracle Advanced Queuing (AQ) JMS Adapter no longer supports nondurable subscribers even though the option is visible on the Adapter Endpoint Configuration Wizard page. This issue is currently being addressed.