

# Oracle® Cloud

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



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Primary Author: Oracle Corporation

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# Preface

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



## Note:

The use of this adapter may differ depending on the features you have, or whether your instance was provisioned using Standard or Enterprise edition. These differences are noted throughout this guide.

## Topics:

- [Audience](#)
- [Documentation Accessibility](#)
- [Diversity and Inclusion](#)
- [Related Resources](#)
- [Conventions](#)

## Audience

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

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We are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

## 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
<b>boldface</b>	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
<code>monospace</code>	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) Adapter

Review the following conceptual topics to learn about the Oracle Advanced Queuing (AQ) 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 \(AQ\) Adapter Capabilities](#)
- [Oracle Advanced Queuing \(AQ\) Adapter Restrictions](#)
- [What Application Version Is Supported?](#)
- [Workflow to Create and Add an Oracle Advanced Queuing \(AQ\) Adapter Connection to an Integration](#)

## Oracle Advanced Queuing (AQ) Adapter Capabilities

The Oracle Advanced Queuing (AQ) Adapter enables you to integrate Oracle AQ in an on-premises Oracle database, Oracle Autonomous Transaction Processing (ATP) database, Oracle Autonomous Data Warehouse (ADW) database, and Oracle Database Classic Cloud Service (DBaaS) database through the on-premises connectivity agent.

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

- Supports the dequeue operation. The dequeue operation polls for incoming messages on a queue.
- Supports opaque and XML schema as message types.
- Supports queues of the Oracle Business Event System type. See [Route Business Event Data to an Oracle Advanced Queue](#).
- Supports raw and object queues.
- Supports the enqueueing of messages in the outbound (invoke) direction.
- Supports processing payloads up to 10 MB in size. The Oracle Advanced Queuing (AQ) Adapter does not consume messages greater than the 10 MB threshold size. It is recommended that you configure **max\_retries** at the AQ level so that the message is eventually moved to the Exception Queue.

### Note:

In Java, Unicode characters are represented as 2 bytes.

- Supports the Oracle Wallet security policy to connect with the Oracle Autonomous Transaction Processing instance, Oracle Autonomous Data Warehouse instance, and Oracle Database Classic Cloud Service instance over SSL.

The Oracle Advanced Queuing (AQ) Adapter is one of many predefined adapters included with Oracle Integration. You can configure the Oracle Advanced Queuing (AQ) Adapter as a trigger or invoke connection in an integration in Oracle Integration.

## Oracle Advanced Queuing (AQ) Adapter Restrictions

Note the following Oracle Advanced Queuing (AQ) Adapter restrictions.

- The Oracle Advanced Queuing (AQ) Adapter supports processing payloads up to 10 MB in size. The Oracle Advanced Queuing (AQ) Adapter does not consume messages greater than the 10 MB threshold size. It is recommended that you configure **max\_retries** at the AQ level so that the message is eventually moved to the Exception Queue.
- The Oracle Advanced Queuing (AQ) Adapter can only be used with the on-premises connectivity agent.

### Note:

There are overall service limits for Oracle Integration. A service limit is the quota or allowance set on a resource. See [Service Limits](#).

## 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) 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.

Step	Description	More Information
1	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.	<a href="#">Create an Oracle Advanced Queuing (AQ) Adapter Connection</a>
2	Create the integration. When you do this, you add trigger and invoke connections to the integration.	Create Integrations and <a href="#">Add the Oracle Advanced Queuing (AQ) Adapter Connection to an Integration</a>
3	Map data between the trigger connection data structure and the invoke connection data structure.	Map Data in <i>Using Integrations in Oracle Integration</i> 3



<b>Step</b>	<b>Description</b>	<b>More Information</b>
4	(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 <i>Using Integrations in Oracle Integration 3</i>
5	Activate the integration.	Manage Integrations in <i>Using Integrations in Oracle Integration 3</i>
6	Monitor the integration on the dashboard.	Monitor Integrations in <i>Using Integrations in Oracle Integration 3</i>
7	Track payload fields in messages during runtime.	Assign Business Identifiers for Tracking Fields in Messages and Manage Business Identifiers for Tracking Fields in Messages in <i>Using Integrations in Oracle Integration 3</i>
8	Manage errors at the integration level, connection level, or specific integration instance level.	Manage Errors in <i>Using Integrations in Oracle Integration 3</i>

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# 2

## Create an Oracle Advanced Queuing (AQ) 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](#)
- [Create a Connection](#)

## Prerequisites for Creating a Connection

You must satisfy the following prerequisites to create a connection with the Oracle Advanced Queuing (AQ) Adapter:

### Prerequisites to Use the Username Password Token Security Policy

- Associate the database schema with the business event system queue type. This is because Oracle Advanced Queueing (AQ) supports only the business event system queue.
- 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.

### Prerequisites to Use the Oracle Wallet Security Policy

- Associate the database schema with the business event system queue type. This is because Oracle Advanced Queueing (AQ) supports only the business event system queue.
- Know the Oracle system service name for the Oracle Advanced Queueing (AQ) server.
- Know the user name and password for the Oracle Advanced Queueing (AQ) server.
- 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.

- 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 Secure Sockets Layer Authentication for Administrative Users](#) in the *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.

To create a connection in Oracle Integration:

1. In the navigation pane, click **Design**, then **Connections**.
2. Click **Create**.

### Note:

You can also create a connection in the integration canvas. See [Define Inbound Triggers and Outbound Invokes](#).

3. In the Create connection panel, 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.
4. Enter the information that describes this connection.

Element	Description
<b>Name</b>	Enter a meaningful name to help others find your connection when they begin to create their own integrations.
<b>Identifier</b>	Automatically displays the name in capital letters that you entered in the <b>Name</b> field. If you modify the identifier name, don't include blank spaces (for example, SALES OPPORTUNITY).
<b>Role</b>	<p>Select the role (direction) in which to use this connection (trigger, invoke, or both). Only the roles supported by the adapter are displayed for selection. 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.</p> <p>For example, assume you configure a connection for the Oracle Service Cloud (RightNow) Adapter as only an <b>invoke</b>. Dragging the adapter to a <b>trigger</b> section in the integration produces an error.</p>
<b>Keywords</b>	Enter optional keywords (tags). You can search on the connection keywords on the Connections page.
<b>Description</b>	Enter an optional description of the connection.
<b>Share with other projects</b>	<p><b>Note:</b> This field only appears if you are creating a connection in a project.</p> <p>Select to make this connection publicly available in other projects. Connection sharing eliminates the need to create and maintain separate connections in different projects.</p> <p>When you configure an adapter connection in a different project, the <b>Use a shared connection</b> 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.</p>

5. Click **Create**.

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

## Configure Connection Properties

Use this procedure to configure the connection properties for the Oracle Advanced Queuing (AQ) Adapter.

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

2. Provide the connection properties based on the security policy you want to configure for your connection:
  - To configure the **Username Password Token** security policy:
    - a. In the **Host** field, enter the host name for the Oracle Advanced Queueing (AQ) server.
    - b. In the **Port** field, enter the Oracle Advanced Queueing (AQ) server communications port number.
    - c. 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.
  - To configure the **Oracle Wallet** security policy:
    - a. In the **Service Name** field, enter the logical representation of a service used for client connections. It is recommended that you use the low profile as the database service name.

 **Note:**

- To configure the Oracle Wallet security policy, the service name must be the same as the one in the `tnsnames.ora` file in the wallet. However, if you receive an error when testing the connection, it may be because the name is too long. See *Service Name Specified on the Connections Page is Too Long* in *Using the Oracle Autonomous Transaction Processing Adapter with Oracle Integration 3*.
- The host and port values are not required to configure the Oracle Wallet security policy.
- For the Username Password Token security policy, either enter an SID or service name value to configure the supported security policy. Do not specify values in both the **SID** and **Service Name** fields.
- Connectivity with the Oracle Autonomous Transaction Processing instance and Oracle Autonomous Data Warehouse instance is not supported with the Username Password Token security policy.

## Configure Connection Security

Use this procedure to configure security for your Oracle Advanced Queueing (AQ) Adapter connection.

1. Go to the **Security** section.
2. Select the security policy.
3. If you select **Username Password Token**:
  - a. In the **Username** field, enter the user name for the Oracle Advanced Queueing (AQ) server account. See [Prerequisites to Use the Username Password Token Security Policy](#).

- b. In the **Password** field, enter the password for the Oracle Advanced Queuing (AQ) server account. See [Prerequisites to Use the Username Password Token Security Policy](#).
4. If you select **Oracle Wallet**:
- a. In the **Wallet** field, select the check box, and click **Upload** to upload the wallet file. See [Prerequisites to Use the Oracle Wallet Security Policy](#).

 **Note:**

The supported file format for the wallet file is `.zip`.

- b. In the **Wallet Password** field, enter the wallet password.
- c. In the **Database Service Username** field, enter the database username to connect to the Oracle Advanced Queuing (AQ) server account.
- d. In the **Database Service Password** field, enter the database password to connect to the Oracle Advanced Queuing (AQ) server account.

 **Note:**

The database service username is *not* the same as the database service name that you specified in the **Properties** section.

## 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

Select the option for accessing your endpoint.

Option	This Option Appears If Your Adapter Supports ...
<b>Connectivity agent</b>	<p>Connections to on-premises endpoints through the connectivity agent.</p> <ol style="list-style-type: none"> <li>1. Click <b>Associate agent group</b>. The Associate agent group panel appears.</li> <li>2. Select the agent group, and click <b>Use</b>.</li> </ol> <p>To configure an agent group, you must download and install the on-premises connectivity agent. See <a href="#">Download and Run the Connectivity Agent Installer</a> and <a href="#">About Creating Hybrid Integrations Using Oracle Integration in <i>Using Integrations in Oracle Integration 3</i></a>.</p>

## 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.
Uses a WSDL	A dialog prompts you to select the type of connection testing to perform: <ul style="list-style-type: none"><li>• <b>Validate and Test:</b> 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.</li><li>• <b>Test:</b> Connects to the WSDL URL and performs a syntax check on the WSDL. No requests are sent to the operations exposed in the WSDL.</li></ul>

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) Adapter Connection to an Integration

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

These topics describe the wizard pages that guide you through configuration of the Oracle Advanced Queuing (AQ) Adapter as a trigger and invoke in an integration.

### Topics:

- [Basic Info Page](#)
- [Dequeue Operations or Enqueue Operations Page](#)
- [Summary Page](#)

## Basic Info Page

You can enter a name and description on the Basic Info page of each adapter in your integration.

Element	Description
<b>What do you want to call your endpoint?</b>	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: <ul style="list-style-type: none"><li>• No blank spaces (for example, My Inbound Connection)</li><li>• No special characters (for example, #;83&amp; or righ(t)now4) except underscores and hyphens</li><li>• No multibyte characters</li></ul>
<b>What does this endpoint do?</b>	Enter an optional description of the connection's responsibilities. For example:  <code>This connection receives an inbound request to synchronize account information with the cloud application.</code>

## Dequeue Operations or Enqueue Operations Page

Enter the Oracle Advanced Queuing (AQ) Adapter trigger dequeue operation properties or invoke enqueue operation properties for your integration. For dequeue operations, you can select the database schema and queue name. For enqueue operations, you can select to use an existing schema or no schema (message is sent in opaque format).

The database schema must be associated with the raw, object, or business event system queue type.



Table 3-1 Trigger Dequeue Operations

Element	Description
<b>Select Queue Type</b>	<p>Identifies the queue type for the dequeue operation.</p> <ul style="list-style-type: none"> <li>• <b>All:</b> Displays all types.</li> <li>• <b>Raw:</b> Select to provide a schema or check an opaque schema for raw queues.</li> <li>• <b>Object:</b> If the database to which to connect includes a queue created from an object type (abstract data type (ADT)), this type is available for selection. This selection enables you to receive the entire ADT object or a single field within the object as the payload.</li> <li>• <b>Business Event System:</b> A queue is recognized as a business event system if the object type is <b>WF_EVENT_T</b> and the payload field is <b>EVENT_DATA</b>.</li> </ul>
<b>Select Database Schema</b>	Selects the database schema for the dequeue operation.
<b>Select Queue Name</b>	Identifies the queue name for the dequeue operation.
<b>Consumer Name</b>	<p>Identifies the consumer name for the dequeue operation. The consumer for a queue is automatically generated using the current timestamp (for example, ICSCONSUMER_160407122433433). Therefore, when you drag and drop the Oracle Advanced Queuing (AQ) Adapter into the integration canvas and invoke the Adapter Endpoint Configuration wizard, a new consumer is generated. If you later re-edit the endpoint in the Adapter Endpoint Configuration wizard, the consumer name is preserved.</p>
<b>Correlation Identifier</b>	<p>Specify an optional correlation value between 1 and 30 characters in length. This value is agreed upon between the enqueueing sender and the dequeuing receiver. This enables you to be selective about the messages to dequeue. Only messages with this correlation value are dequeued and processed. If you do not enter a value, all messages in the queue are dequeued and processed.</p>
<b>Do you want to define a schema for this endpoint</b>	Indicates if a schema is defined for the endpoint.
<b>Select an Existing Schema from the File System</b>	<ul style="list-style-type: none"> <li>• <b>Select Other File</b> Selects the schema file for the endpoint.</li> <li>• <b>Selected File Name</b> Identifies the name of the schema file selected for the endpoint.</li> <li>• <b>Select the Schema Element</b> Selects the schema element for the dequeue operation.</li> </ul>
<b>Select Business Payload Type</b>	<ul style="list-style-type: none"> <li>• <b>Whole Object WRAPPER_TYPE:</b> Select to base the payload on the entire object.</li> <li>• <b>Field Within Object:</b> Select to base the payload on a single field within the object. You are then prompted to: <ul style="list-style-type: none"> <li>– Browse for the field that contains the payload.</li> <li>– Specify the message schema definition.</li> </ul> </li> </ul>

Table 3-2 Invoke Enqueue Operations

Element	Description
<b>Select Queue Type</b>	Identifies the queue type for the enqueue operation. <ul style="list-style-type: none"> <li>• <b>All:</b> Displays all types.</li> <li>• <b>Raw:</b> Select to provide a schema or check an opaque schema for raw queues.</li> <li>• <b>Object:</b> If the database to which to connect includes a queue created from an object (ADT) type, this type is available for selection. This selection enables you to receive the entire ADT object or a single field within the object as the payload.</li> <li>• <b>Business Event System:</b> A queue is recognized as a business event system if the object type is <b>WF_EVENT_T</b> and the payload field is <b>EVENT_DATA</b>.</li> </ul>
<b>Select Database Schema</b>	Selects the database schema for the enqueue operation.
<b>Select Queue Name</b>	Identifies the queue name for the enqueue operation.
<b>Correlation Identifier</b>	Specify an optional correlation value between 1 and 30 characters in length. This value is agreed upon between the enqueueing sender and the dequeueing receiver. This enables you to be selective about the messages to enqueue. Only messages with this correlation value are dequeued and processed. If you do not enter a value, all messages in the queue are dequeued and processed.
<b>Do you want to define a schema for this endpoint</b>	Indicates if a schema is defined for the endpoint.
<b>Select an Existing Schema from the File System</b>	<ul style="list-style-type: none"> <li>• <b>Select Other File</b> Selects the schema file for the endpoint.</li> <li>• <b>Selected File Name</b> Identifies the name of the schema file selected for the endpoint.</li> <li>• <b>Select the Schema Element</b> Selects the schema element for the dequeue operation.</li> </ul>
<b>Select Business Payload Type</b>	<ul style="list-style-type: none"> <li>• <b>Whole Object WRAPPER_TYPE:</b> Select to base the payload on the entire object.</li> <li>• <b>Field Within Object:</b> Select to base the payload on a single field within the object. You are then prompted to: <ul style="list-style-type: none"> <li>– Browse for the field that contains the payload.</li> <li>– Specify the message schema definition.</li> </ul> </li> </ul>

## Summary Page

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

Element	Description
<b>Summary</b>	<p>Displays a summary of the configuration values you defined on previous pages of the wizard.</p> <p>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.</p> <p>To return to a previous page to update any values, click the appropriate tab in the left panel or click <b>Go back</b>.</p> <p>To cancel your configuration details, click <b>Cancel</b>.</p>

# 4

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

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

### Topics:

- [Route Business Event Data to an Oracle Advanced Queue](#)

## Route Business Event Data to an Oracle Advanced Queue

This use case describes how the data for an on-premises application's two business events (the on-premises applications can be Oracle Siebel, Oracle E-Business Suite, and so on) can be routed to their respective AQs. The Oracle Advanced Queuing (AQ) Adapter consumes these messages in Oracle Integration.



### Note:

This use case is provided for explanation purposes. Your actual use case and setup may differ.

On-premises application's database (Oracle database) configuration setup requirements:

1. Ensure that the database user has the necessary privileges on the AQ packages (for this example, HR user).
2. Create an object type in the database.

```
CREATE TYPE WF_EVENT_T AS OBJECT (  
    EVENT_DATA CLOB  
);
```

This is a one time activity to define the object type for the business event system queues.

3. For this example, two queues (ACCOUNT\_Q and CONTACT\_Q) are used where two application events messages are available. Create these necessary queues and queues tables. The queues table payload type should be the WF\_EVENT\_T type created in Step 2. The following sample scripts are provided (for this example, the HR user is used).

```
EXECUTE dbms_aqadm.create_queue_table(queue_table =>  
'ACCOUNT_Q_TAB',multiple_consumers => true,queue_payload_type =>  
'HR.WF_EVENT_T');
```

```
EXECUTE dbms_aqadm.create_queue(queue_name=>'ACCOUNT_Q',queue_table =>  
'ACCOUNT_Q_TAB',retention_time => 86400);
```

```
EXECUTE dbms_aqadm.start_queue('ACCOUNT_Q');

EXECUTE dbms_aqadm.create_queue_table(queue_table =>
'CONTACT_Q_TAB',multiple_consumers => true,queue_payload_type =>
'HR.WF_EVENT_T');

EXECUTE dbms_aqadm.create_queue(queue_name=>
'CONTACT_Q',queue_table => 'CONTACT_Q_TAB',retention_time => 86400);

EXECUTE dbms_aqadm.start_queue('CONTACT_Q');
```

#### Integration-related configurations:

1. Build two integrations using the Oracle Advanced Queuing (AQ) Adapter as a trigger. Each integration consumes messages from the respective queues. While configuring the Oracle Advanced Queuing (AQ) Adapter, XML schema can also be defined for each queue to define the payload structure.
2. Perform mappings for each integration based on the defined XML schema for the payload structure.