Oracle® Cloud
Using Oracle Integration Cloud Service
Release 16.4
E55390-23

December 2016
This guide describes how to create, activate, monitor, and manage integrations in Oracle Integration Cloud Service.
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Preface

Using Oracle Integration Cloud Service describes how to use Oracle Integration Cloud Service to integrate your applications.

Topics:

• Audience
• Related Resources
• Conventions

Audience

Using Oracle Integration Cloud Service is intended for users who want to create, activate, and monitor application integrations.

Related Resources

For more information, see these Oracle resources:

• Oracle Cloud
  http://cloud.oracle.com
• Using the Oracle Mapper
• Using the Adobe eSign Adapter
• Using the Advanced Queuing (AQ) Adapter
• Using the Concur Adapter
• Using the DB2 Adapter
• Using the DocuSign Adapter
• Using the Evernote Adapter
• Using the Eventbrite Adapter
• Using the Facebook Adapter
• Using the File Adapter
• Using the FTP Adapter
• Using the Gmail Adapter
• Using the Google Calendar Adapter
• Using the Google Task Adapter
• Using the JD Edwards EnterpriseOne Adapter
• Using the JMS Adapter
• Using the LinkedIn Adapter
• Using the MailChimp Adapter
• Using the Microsoft Email Adapter
• Using the Microsoft Contact Adapter
• Using the Microsoft Calendar Adapter
• Using the Microsoft SQL Server Adapter
• Using the MySQL Adapter
• Using the Oracle Commerce Cloud Adapter
• Using the Oracle Database Adapter
• Using Oracle E-Business Suite Adapter
• Using the Oracle Field Service Adapter
• Using the Oracle Responsys Adapter
• Using the Oracle Siebel Adapter
• Using the Oracle Utilities Adapter
• Using the SAP Adapter
• Using the SAP Ariba Adapter
• Using the SurveyMonkey Adapter
• Using the Twilio Adapter
• Using the Twitter Adapter

Conventions

The following text conventions are used in this document:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Meaning</th>
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<tbody>
<tr>
<td><strong>boldface</strong></td>
<td>Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.</td>
</tr>
<tr>
<td><em>italic</em></td>
<td>Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.</td>
</tr>
<tr>
<td>Convention</td>
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<td>------------</td>
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</tr>
<tr>
<td>monospace</td>
<td>Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.</td>
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Getting Started with Integration Cloud Service

Review the following topics to learn about how Integration Cloud Service works. These topics provide information about Integration Cloud Service concepts and components to help you get started with creating your own integrations.

Topics

• About Integration Cloud Service
• Integration Cloud Service Concepts
• About Monitoring
• About Error Management
• About Business Identifiers for Tracking Fields in Messages
• Starting Integration Cloud Service
• Navigating Integration Cloud Service
• About Oracle Integration Cloud Service Roles and User Accounts

About Oracle Integration Cloud Service

Oracle Integration Cloud Service is a complete, secure, but lightweight integration solution that enables you to connect your applications in the cloud. It simplifies connectivity between your applications and connects both your applications that live in the cloud and your applications that still live on premises. Oracle Integration Cloud Service provides secure, enterprise-grade connectivity regardless of the applications you are connecting or where they reside.

Oracle Integration Cloud Service provides native connectivity to Oracle Software as a Service (SaaS) applications, such as Oracle Sales Cloud, Oracle RightNow Cloud, and so on. Oracle Integration Cloud Service adapters simplify connectivity by handling the underlying complexities of connecting to applications using industry-wide best practices. You only need to create a connection that provides minimal connectivity information for each system. Oracle Integration Cloud Service lookups map the different codes or terms used by the applications you are integrating to describe similar items (such as country or gender codes). Finally, the visual data mapper enables you to quickly create direct mappings between the trigger and invoke data structures. From the mapper, you can also access lookup tables and use standard XPath functions to map data between your applications.

Once you integrate your applications and activate the integrations to the runtime environment, the dashboard displays information about the running integrations so you can monitor the status and processing statistics for each integration. The
dashboard measures and tracks the performance of your transactions by capturing and reporting key information, such as throughput, the number of messages processed successfully, and the number of messages that failed processing. You can also manage business identifiers that track fields in messages and manage errors by integrations, connections, or specific integration instances.

**About Integration Cloud Service Concepts**

The following topics describe each of the components required to create an end-to-end integration. Each integration includes connections and mappings. You can also include lookups, which are reusable mappings for the different codes and terms used in your applications to describe the same item. You can also group integrations into packages.

**Topics**

- Integration Cloud Service Connections
- Integration Cloud Service Integrations
- About Mappings
- About Integration Cloud Service Enrichments
- Integration Cloud Service Lookups
- About Integration Cloud Service Packages
- About Agents and Integrations Between On-Premises Applications and Oracle Integration Cloud Service

**About Oracle Integration Cloud Service Connections**

Connections define information about the instances of each configuration you are integrating. Oracle Integration Cloud Service includes a set of predefined adapters, which are the types of applications on which you can base your connections, such as Oracle Sales Cloud, Oracle Eloqua Cloud, Oracle RightNow Cloud, and others. A connection is based on an adapter. A connection includes the additional information required by the adapter to communicate with a specific instance of an application (this can be referred to as metadata or as connection details). For example, to create a connection to a specific RightNow Cloud application instance, you must select the Oracle RightNow adapter and then specify the WSDL URL, security policy, and security credentials to connect to it.

**Video**

**Connection Creation**

You can create a connection based on any of the following adapters to which you are subscribed.

<table>
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<td>Concur Adapter</td>
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<td>REST Adapter</td>
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Integration Cloud Service Messaging

Integration Cloud Service Messaging enables you to publish messages to and subscribe to messages from Integration Cloud Service.

You may have business use cases in which you need to synchronize objects between applications. For example:

- Create an object in one application that causes the object to be created in other applications. For example, create a new account in Oracle Sales Cloud Adapter, which causes the creation of an Oracle RightNow organization and an Oracle Eloqua account.

- Enable multiple applications to subscribe to Integration Cloud Service and register for updates.

- Add or remove subscribers without impacting other subscribers or producers.

Integration Cloud Service Messaging addresses these business requirements through the creation of two types of integrations: one for publishing to Integration Cloud Service and one for subscribing to Integration Cloud Service.

- You create an integration that enables you to publish messages to Integration Cloud Service by selecting the **Publish to ICS** option in the Create Integration — Select a Pattern dialog. In this integration:
  - Integration Cloud Service is added as an invoke and is automatically configured.
  - You configure a trigger (source) adapter (for example, Oracle RightNow, Oracle Sales Cloud, or another).
  - The message to pass to Integration Cloud Service is opaque, so no request mapper support is provided.
  - No trigger (source) enrichment mapper support is provided.
  - Multiple publishers targeting a single message destination is not supported.

**Note:** Modifying the publisher after creating the subscribers can potentially impact the subscribers. For example, if you change the published object, any existing subscriber mappings are impacted.
• You create an integration that enables you to subscribe to messages from Integration Cloud Service by selecting the **Subscribe to ICS** option in the Create Integration — Select a Pattern dialog. In this integration:
  
  – Integration Cloud Service is added as a trigger (source).
  
  – You are prompted to select the published integration to which to subscribe.

  
  – You configure an invoke adapter to subscribe to and receive messages from Integration Cloud Service.
  
  – Response mapper support is provided between the published object and the subscriber’s application object.
  
  – Trigger (source) enrichment mapper support is provided.

For more information, see Creating an Integration to Publish Messages to Integration Cloud Service and Creating an Integration to Subscribe to Integration Cloud Service.

**About Oracle Integration Cloud Service Integrations**

Integrations are the main ingredient of Oracle Integration Cloud Service. An integration includes at least a trigger (source) connection (for requests sent to Oracle Integration Cloud Service) and invoke (target) connection (for requests sent from Oracle Integration Cloud Service to the target) and the field mapping between those two connections.

When you create your integrations, you build on the connections you already created by defining how to process the data for the trigger (source) and invoke (target) connections. This can include defining the type of operations to perform on the data, the business objects and fields against which to perform those operations, required schemas, and so on. To make this easier, the most complex configuration tasks are handled by Oracle Integration Cloud Service. Once your trigger (source) and invoke
(target) connections are configured, the mappers between the two are enabled so you can define how the information is transferred between the trigger (source) and invoke (target) data structures for both the request and response messages.

Video

Related Topics
See the following sections for additional information.

- For more information about triggers (sources) and invokes (targets), see Adding a Source Connection and Adding a Target Connection.
- For information about creating a connection, see Creating a Connection.

About Mappings
One of the key tasks to any integration is defining how data is transferred, or mapped, between two applications.

In most cases, the messages you want to transfer between the applications in an integration have different data structures. A visual mapper enables you to map fields between applications by dragging source fields onto target fields. When you open the mapper for a request or response message in an integration, the data structures are automatically populated with the information pulled from the source and target connections. You can expand and the load data structure levels on demand to display additional levels. There is no limit on the levels of display.

The maps you create are called transformation maps, and use the eXtensible Stylesheet Language (XSL) to describe the data mappings, which lets you perform complex data manipulation and transformation. A standard set of XPath functions are provided for you to define how data is modified when moving from one application to another. A specialized function is also provided for you to reference lookups directly from the mapper.
The mapper supports both qualified and unqualified schemas (that is, schemas without `elementFormDefault="qualified"`). Elements and attributes with and without namespace prefixes are also supported.

Substitution groups in schemas are supported. You can see all the substitutable elements in a base element in the mapper, and select the one to use.

Elements and attributes for which mapping is required are identified by a blue asterisk (*) to the left of their names. To display only required fields, click the Filter icon, select Required Fields, and click Apply.

You can also place your cursor over elements and attributes to display specific schema details such as the data type, if mapping is required, and so on. When you place your cursor over some elements and attributes, additional custom annotations can also be displayed. These annotations are currently only available with the Oracle Sales Cloud Adapter. The Oracle Sales Cloud Adapter obtains this information from the applications and annotates it in the integration WSDL. This information is then read and made visible as annotations in the mapper (for example, title and description). This information can help you better understand what data is being mapped.
Mapping Request Data Between Applications

Once you create an integration and have the trigger (source) and invoke (target) in place, you can define how data is mapped between the two data structures.

The mapper appears with the source data structure on the left and the target data structure on the right:

1. Map request data between the source data structure and target data structure.
2. On the toolbar, click Save.

When returning from the mapper, the map icon changes color to indicate it is complete. Once you create a mapping in an integration, you can return to the mapping and make any necessary changes to how you mapped your data.

For procedural instructions about mapping request data between applications, see Mapping Data of Using the Oracle Mapper.

Mapping Response Data Between Applications

If your integration pattern contains a response, you can map the response.

1. Map response data between the source data structure and target data structure.
2. On the toolbar, click Save.

When returning from the mapper, the map icon changes color to indicate it is complete.

Once you create a mapping in an integration, you can return to the mapping and make any necessary changes to how you mapped your data.

For procedural instructions about mapping response data between applications, see Mapping Data of Using the Oracle Mapper.

About Mapping Multiple Sources to a Target

When mapping data between source and target data structures, some integration scenarios enable you to map the fields of multiple source structures to the fields of a single target structure.

Integration scenarios that include multiple source structure capabilities include the following:

- Integrations in which message enrichment points have been added (for example, a request message enrichment point, a response message enrichment point, or both points). For example, within the context of the following inbound trigger connection to outbound invoke connection, request mappings and request enrichment mappings are both defined.
Clicking the **Request Mapping** icon shows that there are two sources available for mapping in the **Source** section. The **process** structure is the primary source. The **$RequestEnrichmentApplicationObject** structure is the secondary source. Secondary sources are treated as variables and identified by the $ added to the front. The fields of both sources can be mapped to the fields of the target.

- Integration responses with a response mapping between a trigger connection and an invoke connection. For example, within the context of the invoke connection’s response back to the trigger connection, there are response mappings.

Clicking the **Response Mapping** icon shows the two sources available for mapping in the **Source** section. The **GetResponse** structure is the primary source. The **$SourceApplicationObject** structure is the secondary source (note the $). The fields of both sources can be mapped to the fields of the target.

For more information, see Mapping Multiple Sources to a Target of *Using the Oracle Mapper*. 
About Integration Cloud Service Enrichments

You may have business use cases in which you need to enhance data by calling another service before sending data to an invoke service or before sending data back to a requestor. To address this business requirement, you can optionally add enrichment data sources to the request part, the response part, or both parts of an integration. Enrichments participate in the overall integration flow and can be used in the request and/or response payloads between the trigger and invoke services. Enrichments subscribe to a synchronous request and response message pattern.

Enrichments enable you to:

- Add additional information. For example, your business use case may require you to:
  - Add a stock price
  - Increase on-site quantities of a product
  - Estimate local currency
- Convert data, such as mapping data between account numbers. The ability to map data between the request/response payload and the enrichment source application is a key feature of enrichments.

For information about using enrichments, see Adding Request and Response Enrichments.

About Integration Cloud Service Lookups

Use lookups in your integrations to create reusable tables that map the different terms used to describe the same item across your applications.

A lookup associates values used by one application for a specific item to the values used by other applications for the same item. For example, one application uses a specific set of codes to describe countries, while another application uses a different set of codes to describe the same countries. Lookups can be used for items such as mapping gender codes, nationality codes, currency codes—any type of information that your applications must share with each other but that they represent differently. You may have several lookups for one integration, depending on the number of fields that require mapping. Lookups are also reusable, and can be used by multiple integrations. Lookups are based on a static definition, meaning you create and populate them during design time, and are not changed by runtime activities. These tables are used for looking up values only.

**Lookup Function**

Integration Cloud Service provides a lookupValue function that you can call in the mapper to specify when to reference a lookup table. Use this function to look up values at runtime based on information in incoming messages. This way, your integration knows how to map data coming in from one application to data being sent to another application.
For more information, see Referencing Lookups of *Using the Oracle Mapper*.

**Video**

### About Integration Cloud Service Packages

You can group one or more integrations into a single structure called a package. Packages enable you to easily import and export a group of integrations to and from Integration Cloud Service. You can import packages from the Oracle Marketplace. These packages consist of a series of prebuilt integrations provided by Oracle. You can also import and export packages that consist of integrations that you or other users created. Packages are optional, meaning that integrations do not need to be part of packages. However, for a package to exist, it must include at least one integration. Packages cannot be locked to exclude other users of your Integration Cloud Service instance.

Packages are displayed on the Packages page in Integration Cloud Service. From this page, you can view, delete, import, and export packages. You create packages when you create an integration in the Create Integration dialog. You can also update an integration's package in the Update Integration dialog.

For more information, see *Managing Packages* and *Creating an Integration*.

**Video**

### About Agents and Integrations Between On-Premises Applications and Oracle Integration Cloud Service

Oracle Integration Cloud Service provides an agent framework that enables you to create integrations and exchange messages between on-premises applications and Oracle Integration Cloud Service. Message payloads of up to 5 MB are supported.
through the use of compression, which may bring the payload down to 512 KB in size. The on-premises agent provides multithreading support, which allows for multiple executors to perform downstream message processing.

This type of integration enables you to:

- Access SOAP endpoints
- Access non-SOAP endpoints (such as Oracle E-Business Suite and Oracle Siebel)
- Send requests from a cloud application (for example, send a Create Service Order request from an Oracle RightNow Cloud application) to an on-premises E-Business Suite application

The agent framework consists of the following components:

- **SAAS agent:** This agent is installed and runs in Oracle Integration Cloud Service and supports communication with on-premises applications. There is one SAAS agent per Oracle Integration Cloud Service environment.

- **On-premises agent:** This agent is installed and runs in an on-premises environment on the same network as internal systems such as Oracle E-Business Suite, Oracle Siebel, Oracle Database, and others. You download the on-premises agent installer from the Agents page in Oracle Integration Cloud Service to your on-premises environment for installation. Multiple agents can run on a single host. There can be multiple host systems, each running one or more agents, in a cloud/on-premises topology. The on-premises agent does not permit any explicit inbound connections. All connections are established from the on-premises environment to Oracle Integration Cloud Service. This functionality means that:
  
  - No ports are opened on the on-premises system for communication.
  - All communications is secured using SSL.
  - The on-premises agent registers with Oracle Integration Cloud Service over SSL using the provided Oracle Integration Cloud Service credentials.
  - The on-premises agent checks for work by making outbound requests through the firewall.
  - The on-premises agent can use a proxy to access the internet (the same proxy as other internal applications and browsers use).
  - The on-premises agent connections are configured by the agent retrieving the configuration details from Oracle Integration Cloud Service.
  - The on-premises agent processes requests by pulling messages from Oracle Integration Cloud Service across SSL.
  - The on-premises agent posts responses by pushing messages to Oracle Integration Cloud Service across SSL.
  - All communication is initiated by the on-premises agent.
  - No private SOAP-based web services are exposed.
  - No existing J2EE container is required to deploy the on-premises agent.

- **Oracle Messaging Cloud Service:** This service handles message exchange between Oracle Integration Cloud Service and on-premises environments.
- Outbound adapters: The following adapters can be configured as invoke connections in an integration to support communication with endpoint applications:
  - File
  - Microsoft SQL Server
  - MySQL Database
  - Oracle Database
  - Oracle E-Business Suite
  - REST
  - SAP
  - Siebel
  - SOAP

- Inbound adapters: The following adapters can be configured as trigger connections in an integration:
  - File
  - Microsoft SQL Server
  - Oracle Database
  - Oracle E-Business Suite
  - SAP
  - Siebel

**Workflow for Using the On-Premises Agent**

You follow this workflow to use the on-premises agent.

<table>
<thead>
<tr>
<th>Task</th>
<th>Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create an agent group.</td>
<td>Creating an Agent Group</td>
</tr>
<tr>
<td>Download and run the on-premises agent installer on your host. During installation setup, you associate the on-premises agent with the agent group.</td>
<td>Downloading and Running the On-Premises Agent Installer</td>
</tr>
<tr>
<td>Create an adapter connection in Oracle Integration Cloud Service and associate the connection with the agent group.</td>
<td>Creating a Connection with an Agent Group</td>
</tr>
<tr>
<td>Design an integration that uses this connection.</td>
<td>Creating an Integration</td>
</tr>
<tr>
<td>Activate the integration.</td>
<td>Activating an Integration</td>
</tr>
</tbody>
</table>
For more information, see Managing Agent Groups and the On-Premises Agent and Monitoring Agents.

Video

About Monitoring

The Integration Cloud Service dashboard displays information about the current state of all your running integrations.

The dashboard gives you a quick view into the performance metrics for all of your active integrations. The graph includes the total number of messages processed, the average processing time, the number of messages with errors, and the success rate. The Integrations tab lists metrics for each running integration, and you can view a graph of the metrics for each integration in the list. The dashboard also provides a view of recent activity for running integrations and the ability to download all activities.

Video

About Error Management

You can manage integration errors from the Errors pages in Integration Cloud Service. The Errors pages display information about individual integration instances and group the errors by integrations and connections over a specified time period.

You can perform the following tasks from the Errors page and its subpages:

- Search for and display errors by integration name or the total error count over a specific time period
- Resubmit errors
- Discard (remove) errors by integration name
- Display errors by connection name over a specific time period
- Discard errors by connection name
- Display errors by integration instance identifier, error location, or time of occurrence over a specific time period
- View the instance in which errors occurred
- View the error message
• View and discard errors by instance ID
• View the audit trail and message payload of a failed integration instance
• View the business identifiers of a failed integration instance

**Integration Failure Scenarios**

Integrations can fail for the following reasons:

• A call to a target system fails because the target system is down (for a short or long time period).

• A source-to-target transformation or target-to-source transformation fails because of faulty XSL coding, an invalid lookup call, or other system issue.

• A target system call results in a business failure for the following possible reasons:
  – Incorrect target application configuration
  – Invalid lookup data
  – Invalid business data

• A call to a trigger system (with a response message) fails because the trigger system is down.

• An enrichment step fails.

• A publish/subscribe scenario fails.

• Any other Integration Cloud Service system failure.

For more information about error management, see Managing Errors.

**About Business Identifiers for Tracking Fields in Messages**

Business identifiers enable you to track payload fields in messages during runtime. You define up to three business identifiers on payload fields during design time. You designate one field as the primary business identifier field, which enables message fields to be tracked during runtime.

During runtime, the Tracking page displays information about the status of business identifiers and their values in your integrations.
If you have defined business identifiers in integrations that have failed, you can view details on the Errors page.

For more information, see Assigning Business Identifiers for Tracking Fields in Messages, Managing Business Identifiers for Tracking Fields in Messages, and Managing Errors.

Starting Integration Cloud Service

To get started with Integration Cloud Service, you must have a user account already set up. You access Integration Cloud Service through a web browser.

You receive your user account when you subscribe to Integration Cloud Service.

To access Integration Cloud Service:

1. In a web browser, enter the following URL, where hostname is the name of the host you received in your email after provisioning Oracle Integration Cloud Service, and port_number is the port number on which the server is listening (by default, 7001):

   https://hostname:port_number/ics

2. On the login page, enter your user name and password.

The first page to appear is the home page, which illustrates the typical development workflow and provides links both to the functions of Integration Cloud Service and to sources of additional information about each function.

**Note:** If your instance is down for maintenance (for example, your instance is being upgraded to a newer release), the following message is displayed:

ICS is in maintenance mode. Try again later.
Navigating Integration Cloud Service

Integration Cloud Service provides multiple ways to access the different features you use to create and monitor your integrations.

From the Integration Cloud Service main menu, you can access the home page, the designer portal, and the dashboard.

Navigating from the Home Page

The first page you see when you log in to Integration Cloud Service is the home page. This page provides links to more information and demonstrations for each feature. You can also access the Connections page, the Integrations page, the Dashboard page, the Lookups page, and the Packages page from the home page. To return to the home page from any other Integration Cloud Service page, click Home in the main menu.

Navigating from the Designer Portal

The designer portal provides links to the primary development features of Integration Cloud Service—integrations, connections, lookups, packages, agents, and adapters. To access the designer portal from any other Integration Cloud Service page, click Designer in the main menu.

Designer Portal

- Integrations: Connect two cloud applications, and define how they interact with each other.
- Connections: Define connections to the cloud and on-premise applications you want to integrate.
- Lookups: Map the different values used by your applications to describe the same things, like country or state codes.
- Packages: Group related integrations into a single package to make them easy to import and export. You create a package when you create an integration.
- Agents: Connect to on-premise applications.
- Adapters: Adapter helps to connect to your application.
**Navigating from the Designer Menu**

The main Connections, Integrations, Lookups, and Packages pages list the resources you create and also include a menu that gives you access to the other development features. The menu also provides options to filter the current list of resources by their status.

**About Oracle Integration Cloud Service Roles and User Accounts**

Oracle Integration Cloud Service uses roles to control access to tasks and resources. A role assigned to a user gives certain privileges to the user.

In addition to the roles and privileges described in Oracle Cloud User Roles and Privileges in Getting Started with Oracle Cloud, the following role is created for Oracle Integration Cloud Service: Identity Administrator.

The identity administrator can create more users by creating accounts and assigning roles to users. For information about how to add user accounts in Oracle Cloud, see Adding Users and Assigning Roles in Getting Started with Oracle Cloud.

When you create an Oracle Integration Cloud Service user, you can assign that user the following roles:

<table>
<thead>
<tr>
<th>Role</th>
<th>Privileges Provided By This Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle Integration Cloud Service Users Role</td>
<td>Enables you to access all parts of Oracle Integration Cloud Service to perform the following tasks:</td>
</tr>
<tr>
<td></td>
<td>• Create, deploy, and monitor integrations.</td>
</tr>
<tr>
<td></td>
<td>• Upload security certificates.</td>
</tr>
<tr>
<td></td>
<td>You can assign this role to developers.</td>
</tr>
<tr>
<td>Oracle Integration Cloud Service Monitors Role</td>
<td>Enables you to access Oracle Integration Cloud Service to monitor integrations. Only the Monitoring Dashboard is available with this user role. Note the following restrictions with this role:</td>
</tr>
<tr>
<td></td>
<td>• If you click the Integrations, Connections, Lookups, Packages, or Agents icons on the home page, a User is not authorized to perform this action message is displayed.</td>
</tr>
<tr>
<td></td>
<td>• The Administration tab in the upper right corner that enables you to upload security certificates is not visible.</td>
</tr>
<tr>
<td>Oracle Integration Cloud Service Runtime Role</td>
<td>Enables you to access runtime services. This role is assigned to a user and uses SOAP/REST to communicate with services at runtime. This role only has privileges to execute a flow. With this user, you can pass the user name and password for this user to invoke SOAP/REST APIs. A user with this role can log in, but cannot perform any actions in Oracle Integration Cloud Service, and receives a User is not authorized to perform this action message on the home page.</td>
</tr>
<tr>
<td>Oracle Integration Cloud Service Administrators Role</td>
<td>This role is only available to users that have downloaded and installed the on-premises version of Oracle Integration Cloud Service. For information, see Using On-Premises Integration Cloud Service.</td>
</tr>
</tbody>
</table>

---

About Oracle Integration Cloud Service Roles and User Accounts
## Developing Integration Cloud Services

You develop integrations using a simple but robust set of components, including connections to the applications you are integrating, data mappings, and lookups that map similar objects across the applications with which you share data.

### Topics

- Typical Workflow for Creating Integration Cloud Services
- Creating Connections
- Creating Integrations
- Mapping Integration Cloud Service Data
- Creating Lookups
- Creating the lookupValue Function
- Importing Map Files
- Importing and Exporting Components
- Assigning Business Identifiers for Tracking Messages
- Managing Packages
- Managing Agent Groups and the On-Premises Agent

### Typical Workflow for Creating Integration Cloud Services

You follow a very simple workflow to develop integrations in Integration Cloud Service. The only prerequisites for creating an integration are that the application connections you need are in place and that any lookups you want to use to map information between applications are created.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>More Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Create the connections for the applications you want to integrate. The connections can be reused in multiple integrations and are typically created by the administrator.</td>
<td>Creating a Connection</td>
</tr>
<tr>
<td>Step</td>
<td>Description</td>
<td>More Information</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>2</td>
<td>(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).</td>
<td>Creating a Lookup</td>
</tr>
</tbody>
</table>
| 3    | Create the integration. When you do this, you add trigger and invoke connections, and then map the data between the two. | 1. Creating an Integration  
2. Adding a Source Connection  
3. Adding a Target Connection  
4. Mapping Data of Using the Oracle Mapper |
| 4    | Activate the integration. | Activating an Integration |
| 5    | Monitor the integration on the dashboard. | Viewing the Dashboard |
| 6    | Track payload fields in messages during runtime. | Assigning Business Identifiers and Tracking Business Identifiers in Integrations During Runtime |
| 7    | Manage errors at the integration level, connection level, or specific integration instance level. | Managing Errors |

### Creating Connections

You define connections to the specific cloud applications that you want to integrate. The following topics describe how to define connections:

**Topics**

- Creating a Connection
- Adding a Contact Email
- Configuring Connection Properties
- Configuring Connection Security
- Testing the Connection
- Editing a Connection
- Cloning a Connection
- Deleting a Connection
- Refreshing Integration Metadata
- Managing Security Certificates
Creating a Connection

The first step in creating an integration is to create the connections to the applications with which you want to share data.

1. In the Integration Cloud Service toolbar, click Designer.

2. On the Designer Portal, click Connections.

3. Click New Connection.

   The Create Connection — Select Adapter dialog is displayed.

4. Select an adapter from the dialog. You can also search for the type of adapter to use by entering a partial or full name in the Search field, and clicking Search.

   The New Connection — Information dialog is displayed.

5. Enter the information to describe the connection.

   • Enter a meaningful name to help others find your connection when they begin to create their own integrations. The name you enter is automatically added in capital letters to the Identifier field. If you modify the identifier name, do not include a blank space (for example, OSC Inbound).

   • Select the role (direction) in which to use this connection (trigger, invoke, or both). Only the roles supported by this 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, then try to drag the adapter into the section you did not select, you receive an error (for example, configure an Oracle RightNow Cloud Adapter as only an invoke, but drag the adapter to the trigger section).

   • Enter an optional description of the connection.
6. Click **Create**.

   Your connection is created and you are now ready to configure connection details, such as email contact, connection properties, security policies, and connection login credentials.

**Adding a Contact Email**

   From the Connection Administrator section of the connection, you can add a contact email address for notifications.

1. In the **Email Address** field, enter an email address to receive email notifications when problems occur.

2. In the upper right corner, click **Save**.

**Configuring Connection Properties**

Enter connection information so your application can process requests.

1. Click **Configure Connectivity**.

   The Connection Properties dialog is displayed.

2. See the following sections for information about specifying connection properties.

<table>
<thead>
<tr>
<th>Adapter</th>
<th>For Information</th>
</tr>
</thead>
<tbody>
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<td>Using the Adobe eSign Adapter</td>
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<tr>
<td>Concur Adapter</td>
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<tr>
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<tr>
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<td>Oracle E-Business Suite Adapter</td>
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</tr>
<tr>
<td>Oracle Field Service Adapter</td>
<td>Using Oracle Field Service Adapter</td>
</tr>
<tr>
<td>Oracle Eloqua Cloud Adapter</td>
<td>N/A</td>
</tr>
<tr>
<td>Oracle ERP Cloud Adapter</td>
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<tr>
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<tr>
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</tr>
</tbody>
</table>

3. Click OK.

You are now ready to configure connection security.

**Configuring Connection Security**

Configure security for your connection by selecting the security policy and specifying login credentials.

1. Click **Configure Credentials**.

2. See the following sections for information about selecting the security policy and entering your login credentials.
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</table>
3. Click **OK**.

   For most adapters, you are now ready to test your connection. For some adapters, you must first configure an agent group.

### Testing the Connection

Test your connection to ensure that it is successfully configured.

1. In the upper right corner of the page, click **Test**.

   If successful, the following message is displayed and the progress indicator shows 100%.

   **The connection test was successful!**

2. If your connection was unsuccessful, an error message is displayed with details. Verify that the configuration details you entered are correct.

3. When complete, click **Save**.

### Editing a Connection

You can edit connection settings after creating a new connection.

1. In the Oracle Integration Cloud Service toolbar, click **Designer**.

2. On the Designer Portal, click **Connections**.

3. On the Connections page, search for the connection name.

4. Select **Edit** from the connection **Actions** menu or click the connection name.

   ![Actions](image)

   The Connection page is displayed.
5. To edit the notification email contact, change the email address in the Email Address field.

6. To edit the connection properties, click Configure Connectivity. Note that some connections do not include this button. If your connector does not include a Configure Connectivity button, then click the Configure Credentials button.

Cloning a Connection

You can clone a copy of an existing connection. It is a quick way to create a new connection.

1. In the Oracle Integration Cloud Service toolbar, click Designer.
2. On the Designer Portal, click Connections.
3. On the Connections page, search for the connection name.
4. Select Clone from the connection Actions menu.

The Clone Connection dialog is displayed.

5. Enter the connection information.
6. Click Clone.
7. Click Edit to configure the credentials of your cloned connection. Cloning a connection does not copy the credentials.

See Editing a Connection for instructions.

Deleting a Connection

You can delete a connection from the connection menu.

1. In the Oracle Integration Cloud Service toolbar, click Designer.
2. On the Designer Portal, click Connections.
3. On the Connections page, search for the connection name.
4. Click Delete from the connection Actions menu.

The Delete Connection dialog is displayed if the connection is not used in an integration.
5. Click Yes to confirm deletion.

**Refreshing Integration Metadata**

You can manually refresh the currently-cached metadata available to adapters that have implemented metadata caching. Metadata changes typically relate to customizations of integrations, such as adding custom objects and attributes to integrations. There may also be cases in which integrations have been patched, which results in additional custom objects and attributes being added. This option is similar to clearing the cache in your browser. Without a manual refresh, a staleness check is only performed when you drag a connection into an integration. This is typically sufficient, but in some cases you may know that a refresh is required. For these cases, the Refresh Metadata menu option is provided.

To refresh integration metadata:

```
Note: The Refresh Metadata menu option is only available with adapters that have implemented metadata caching.
```

1. In the Integration Cloud Service toolbar, click Designer.
2. In the Designer Portal, click Connections.
3. Locate the connection to refresh.
4. From the menu at the right, select Refresh Metadata.

A message is displayed indicating that the refresh was successful.

```
Metadata refresh for connection "connection_type" has been initiated successfully.
```

**Managing Security Certificates**

You can manage security certificates in Oracle Integration Cloud Service.

**Topics**

- Uploading an SSL Certificate
- Updating or Deleting an SSL Certificate

**Uploading an SSL Certificate**

Certificates are used to validate outbound SSL connections. If you make an SSL connection in which the root certificate does not exist in Oracle Integration Cloud Service, an exception is thrown. In that case, you must upload the appropriate
certificate. A certificate enables Oracle Integration Cloud Service to connect with external services. If the external endpoint requires a specific certificate, request the certificate and then upload it into Oracle Integration Cloud Service.

To upload a certificate:

1. From the Oracle Integration Cloud Service home page, click the Administration tab in the upper right corner.

   All certificates currently uploaded to the trust store are displayed in the Certificates dialog. The Filter By > Type list displays the following details:
   - **Preinstalled**: Displays the certificates automatically installed in Oracle Integration Cloud Service. These certificates cannot be deleted.
   - **Uploaded**: Displays the certificates uploaded by individual users. These certificates can be deleted and updated.

   You can also search for certificates in the Search field. The search results are limited to a maximum of ten records sorted by name for performance and usability reasons. To ensure that your search results are more granular, enter as much of the certificate name as possible.

2. Click **Upload** at the top of the page.

3. In the Upload Certificate dialog box, enter a unique identifier for the certificate.

   This is a name you can use to identify the certificate.

4. Click **Browse** to locate the certificate file (.cer).

5. Click **Upload**.

6. Click the certificate name to view details such as the subject of the certificate, the issuer of the certificate, the date the certificate was issued, and the date the certificate expires.

**Updating or Deleting an SSL Certificate**

You can update or delete certificates you uploaded into Oracle Integration Cloud Service. You cannot update or delete system certificates automatically included in Oracle Integration Cloud Service.

To update or delete a certificate:

1. From the Oracle Integration Cloud Service home page, click the Administration tab in the upper right corner.

2. Identify the certificate you want to update or delete through either of the following methods:
   a. Scroll through the complete list or filter the display of system-provided or user-uploaded certifications by selecting Filter By > Type > Preinstalled or Uploaded.
   b. Search by entering a partial or complete certificate name in the Search field. To remove search or filter criteria, click the x icon in the banner.

3. At the far right of the certificate name, click the Actions icon.
4. To update the certificate, click **Update**.
   a. Update the certificate as required, such as updating the certificate name (identifier) and uploading a new certificate. For more information, see **Uploading an SSL Certificate**.

5. To delete the certificate, click **Delete**.
   a. Click **Yes** when prompted to confirm your selection.

### Creating Integrations

Integrations use the connections you created to your applications, and define how information is shared between those applications. You can create new integrations, import integrations, modify or delete integrations, create integrations to publish messages, create integrations to subscribe to messages, and add and remove request and response enrichment triggers. Click one of the following topics for more information.

#### Topics
- Editing the Endpoint Information in an Integration
- Creating an Integration
- Understanding Integration Patterns
- Importing a Prebuilt Integration
- Adding a Trigger (Source) Connection
- Adding an Invoke (Target) Connection
- Creating Orchestration Integrations
- Creating an Integration to Publish Messages to Integration Cloud Service
- Creating an Integration to Subscribe to Integration Cloud Service
- Adding Request and Response Enrichments
- Deleting Request and Response Enrichments
- Creating Routing Paths for Two Different Invoke Endpoints in Integrations
- Creating Routing Expression Logic in Both Expression Mode and Condition Mode
- Deleting Routing Paths
- Editing the Endpoint Information in an Integration

### Creating an Integration

Creating an integration includes defining the trigger and invoke application connections, and defining how data is mapped between the two applications. The procedure below provides general instructions for creating an integration, with links to more detailed information for certain steps. As you perform each step, the progress indicator changes to let you know how close you are to completing the integration.
If you want to use a lookup table in your data mapping, create the lookup first. See Creating Lookups for instructions.

To create an integration:

1. In the Integration Cloud Service toolbar, click Designer.


3. On the Integrations page, click New Integration.

   The Create New integration dialog is displayed.

4. Select the type of integration pattern applicable to your business needs. For more information, see Understanding Integration Patterns.

   The New Integration — Information dialog is displayed.

5. Enter the following information:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
</table>
   | What triggers this integration? | • Application event or business object: This integration uses an event or a business object to trigger the integration. For example, you create an integration with an Oracle RightNow Adapter as a trigger and an Oracle Sales Cloud Adapter as an invoke. The Oracle RightNow Adapter subscribes to an event from the Oracle RightNow application to trigger the integration.  
     • Schedule: This integration uses a schedule to trigger the integration instead of an adapter. For example, you add an initial invoke adapter to read a trigger file and a second FTP adapter to download the file for further processing. After designing this integration, you schedule when to run it. For more information, see Scheduling Integration Runs. |
<p>| Note: This field is only displayed if you selected Orchestration on the Create Integration - Select a Style/Pattern dialog. |
| What do you want to call your integration? | Provide a meaningful name so that others can understand the integration. You can include English alphabetic characters, numbers, underscores, and dashes in the identifier. |
| Identifier | Accept the default identifier value. The identifier is the same as the integration name you provided, but in upper case. |</p>
<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
</table>
| Version | Accept the default version number of 01.00.0000. Or, if you want to change the version number, enter the version using numbers only in this format: xx.xx.xxxx. Integrations are uniquely identified by an identifier and version. Note the version format of xx.yy.zzzz, where xx is the major version and yy.zzzz is the minor version. Integrations having the same identifier, but a different major version, can be active at the same time. For example, INT-A/1.00.0000 and INT-A/2.00.0000 can be active at the same time. When activating an integration while another integration of the same identifier and same major version is already active, the currently activated integration is deactivated prior to activating the selected integration. For example, if two integrations have the following integration states:  
  • INT-A/2.00.0000 - Not active  
  • INT-A/2.10.0000 - Not active  
Integration INT-A/2.00.0000 is then activated.  
  • INT-A/2.00.0000 is now active.  
  • INT-A/2.10.0000 is not active.  
Integration 2.10.0000 is then activated.  
  • INT-A/2.00.0000 is now not active.  
  • INT-A/2.10.0000 is now active. |

**What does this integration do?** Provide a meaningful description so that others can understand the integration.

**Which package does this integration belong to?** Enter a new or existing package name in which to place your integration. As you enter the initial letters of an existing package, it is displayed for selection. For more information about packages, see Managing Packages and About Integration Cloud Service Packages.

6. Click Create.

The integration designer is displayed with the type of integration pattern you selected in the previous step.

7. Click Save.

8. If creating an integration pattern with blank trigger and invoke connections in which to add your own adapters:

   a. Create the trigger connection, as described in Adding a Source Connection.

   b. Create the invoke connection, as described in Adding a Target Connection.

   c. Map data between the two connections, as described in Mapping Data of Using the Oracle Mapper.

9. If creating an integration in which to publish to Integration Cloud Service:

   a. Create an integration in which you add a trigger adapter to publish messages to Integration Cloud Service through a predefined Integration Cloud Service Messaging invoke, as described in Creating an Integration to Publish Messages.
to Integration Cloud Service. No data mapping between the trigger and invoke is permitted.

10. If creating an integration in which to subscribe to Integration Cloud Service:
   
a. Create an integration in which you add an invoke adapter to subscribe to messages from Integration Cloud Service through an Integration Cloud Service Messaging trigger, as described in Creating an Integration to Subscribe to Integration Cloud Service.
   
b. Map data between the invoke adapter and the Integration Cloud Service Messaging trigger to which to subscribe, as described in Mapping Data of Using the Oracle Mapper.

11. When complete, click **Save** and then click **Exit Integration**.

You now see your new integration in the Integrations list ready to be activated. See Activating an Integration for instructions.

### Understanding Integration Patterns

You can select from several types of patterns when creating an integration in the Create Integration — Select a Pattern dialog.

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic Map Data</strong></td>
<td>Create an integration with a blank trigger and invoke in which to add your own adapters. You can also create a single routing expression and request and response enrichments, as needed. You cannot create multiple routing expressions. If your integration requires this feature, create an orchestrated integration.</td>
</tr>
</tbody>
</table>
| **Orchestration** | Create a synchronous, asynchronous, or fire-and-forget orchestrated integration in Oracle Integration Cloud Service that uses Oracle BPEL Process Manager capabilities. Orchestration integration features include the following:  
  - Switch activities to create multiple routing expressions.  
  - For-each activities for looping over repeating elements.  
  - Assign activities for assigning values to scalar variables.  
  - Ad-hoc mappings on switch branches.  
  - Callback activities (to end a process and respond back to the sender) and end activities (to end a process without responding back to the sender) in asynchronous integrations.  
  - Schedule-based integrations  
For more information, see Creating Orchestrated Integrations.
<table>
<thead>
<tr>
<th>Pattern</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Publish to ICS</td>
<td>Create an integration in which you add a trigger adapter to publish messages to Integration Cloud Service through a predefined Integration Cloud Service Messaging invoke. No configuration of the invoke subscriber is required. The publisher and subscribers participating in this integration pattern can be activated and deactivated independently of each other. For more information, see Creating an Integration to Publish Messages to Integration Cloud Service.</td>
</tr>
<tr>
<td>Basic Subscribe to ICS</td>
<td>Create an integration in which you add an invoke adapter to subscribe to messages from Integration Cloud Service through an Integration Cloud Service Messaging trigger. You are prompted to select the publisher to which to subscribe. You must have already created a publisher to which to subscribe. The publisher does not need to be active, but must already be completely configured. Any business identifiers defined on fields in the published integration are copied to the subscriber. Any changes made to the published integration’s business identifiers after copying are not reflected in the subscriber. The publisher and subscribers participating in this integration pattern can be activated and deactivated independently of each other. For more information, see Creating an Integration to Subscribe to Integration Cloud Service.</td>
</tr>
</tbody>
</table>

For more information, see Integration Cloud Service Messaging.

**Importing a Prebuilt Integration**

You can import prebuilt integrations into your Integration Cloud Service environment.

There are two types of prebuilt integrations:

- **User-created integrations.** These are integrations that you or another user created.

- **Oracle-created integrations from the Oracle Marketplace.** You import integrations from the Oracle Marketplace as part of a package. These integrations are designated with a BUILT BY ORACLE message that is displayed next to the integration name on the Integrations page. You cannot edit these integrations, but you can view their contents, including mappings and business identifiers. You must edit the connections in these integrations to include endpoint credentials relevant to your business requirements. You can also clone these integrations, which enables you to edit the cloned version of the integration.
Importing a User-Created Integration

To import a user-created integration:

1. In the Integration Cloud Service toolbar, click Designer.
3. In the banner, click Import.
4. Click Browse to select the file to import. If you are importing a single integration, select the JAR file to import. If you are importing a package of integrations, select the PAR file to import.

Importing a Prebuilt Integration from Oracle Marketplace

To import a prebuilt integration from Oracle Marketplace:

1. In the upper right corner of the page, click the Oracle Marketplace icon.
2. The Oracle Marketplace is displayed.
3. Click Applications.
4. Browse through the list of applications and select the prebuilt integration package to import.
5. When prompted, select the server to which to upload the prebuilt integration file.

The prebuilt integration is imported as a package file that is visible on the Packages page in Integration Cloud Service. If you go to the Integrations page, the individual integrations of that imported package file are designated with a BUILT BY ORACLE message to the right of the integration name.

You can customize the mappings in the prebuilt integrations imported from Oracle Marketplace. See Adding Customized Mappings to Prebuilt Integrations.

Adding a Trigger (Source) Connection

The trigger (source) connection sends requests to Integration Cloud Service. The information required to connect to the application is already defined in the connection. However, you still must specify certain information, such as the business object and operation to use for the request and how to process the incoming data.

To add a trigger connection:

1. In the Integration Designer, drag a connection from the Connections or Technologies panel on the right to the Trigger (source) area on the canvas.
The wizard for the selected connection is displayed.

2. See the following guides for instructions:

<table>
<thead>
<tr>
<th>Adapter</th>
<th>For Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2 Adapter</td>
<td>Using the DB2 Adapter</td>
</tr>
<tr>
<td>File Adapter</td>
<td>Using the File Adapter</td>
</tr>
<tr>
<td>FTP Adapter</td>
<td>Using the FTP Adapter</td>
</tr>
<tr>
<td>Oracle JD Edwards EnterpriseOne Adapter</td>
<td>Using the JD Edwards EnterpriseOne Adapter</td>
</tr>
<tr>
<td>MySQL Adapter</td>
<td>Using the MySQL Adapter</td>
</tr>
<tr>
<td>Oracle Advanced Queuing (AQ) Adapter</td>
<td>Using the Oracle Advanced Queuing (AQ) Adapter</td>
</tr>
<tr>
<td>Oracle Commerce Cloud Adapter</td>
<td>Using the Oracle Commerce Cloud Adapter</td>
</tr>
<tr>
<td>Oracle CPQ Cloud Adapter</td>
<td>Using the Oracle CPQ Adapter</td>
</tr>
<tr>
<td>Oracle Database Adapter</td>
<td>Using the Oracle Database Adapter</td>
</tr>
<tr>
<td>Oracle E-Business Suite Adapter</td>
<td>Using Oracle E-Business Suite Adapter</td>
</tr>
<tr>
<td>Oracle ERP Cloud Adapter</td>
<td>Using the Oracle ERP Cloud Adapter</td>
</tr>
<tr>
<td>Oracle HCM Cloud Adapter</td>
<td>Using the Oracle HCM Cloud Adapter</td>
</tr>
<tr>
<td>Oracle Messaging Cloud Service</td>
<td>Using the Oracle Messaging Cloud Service Adapter</td>
</tr>
<tr>
<td>Oracle RightNow Cloud Adapter</td>
<td>Using the Oracle RightNow Cloud Adapter</td>
</tr>
<tr>
<td>Oracle Sales Cloud Adapter</td>
<td>Using the Oracle Sales Cloud Adapter</td>
</tr>
<tr>
<td>Oracle Siebel Adapter</td>
<td>Using the Oracle Siebel Adapter</td>
</tr>
<tr>
<td>REST Adapter</td>
<td>Using the REST Adapter</td>
</tr>
<tr>
<td>Salesforce Adapter</td>
<td>Using the Salesforce Adapter</td>
</tr>
<tr>
<td>SAP Adapter</td>
<td>Using the SAP Adapter</td>
</tr>
<tr>
<td>SOAP Adapter</td>
<td>Using the SOAP Adapter</td>
</tr>
</tbody>
</table>

**Adding an Invoke (Target) Connection**

Integration Cloud Service sends requests or information to the invoke (target) connection. The information required to connect to the application is already defined.
in the connection. However, you still must specify certain information, such as the business object and operation to use for the request and how to process the data.

To add an invoke (target) connection:

1. In the Integration Designer, drag a connection from the Connections or Technologies panel on the right to the **Invoke** (target) area on the canvas.

![Invoke connection](image)

The wizard for the selected connection is displayed.

2. See the following guides for instructions:

<table>
<thead>
<tr>
<th>Adapter</th>
<th>For Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe eSign Adapter</td>
<td>Using the Adobe eSign Adapter</td>
</tr>
<tr>
<td>Concur Adapter</td>
<td>Using the Concur Adapter</td>
</tr>
<tr>
<td>DB2 Adapter</td>
<td>Using the DB2 Adapter</td>
</tr>
<tr>
<td>DocuSign Adapter</td>
<td>Using the DocuSign Adapter</td>
</tr>
<tr>
<td>Eventbrite Adapter</td>
<td>Using the Eventbrite Adapter</td>
</tr>
<tr>
<td>Evernote Adapter</td>
<td>Using the Evernote Adapter</td>
</tr>
<tr>
<td>Facebook Adapter</td>
<td>Using the Facebook Adapter</td>
</tr>
<tr>
<td>File Adapter</td>
<td>Using the File Adapter</td>
</tr>
<tr>
<td>FTP Adapter</td>
<td>Using the FTP Adapter</td>
</tr>
<tr>
<td>Gmail Adapter</td>
<td>Using the Concur Adapter</td>
</tr>
<tr>
<td>Google Calendar Adapter</td>
<td>Using the Google Calendar Adapter</td>
</tr>
<tr>
<td>Google Task Adapter</td>
<td>Using the Google Task Adapter</td>
</tr>
<tr>
<td>JMS Adapter</td>
<td>Using the JMS Adapter</td>
</tr>
<tr>
<td>LinkedIn Adapter</td>
<td>Using the LinkedIn Adapter</td>
</tr>
<tr>
<td>MailChimp Adapter</td>
<td>Using the MailChimp Adapter</td>
</tr>
<tr>
<td>Microsoft Calendar Adapter</td>
<td>Using the Microsoft Calendar Adapter</td>
</tr>
<tr>
<td>Microsoft Contact Adapter</td>
<td>Using the Microsoft Contact Adapter</td>
</tr>
<tr>
<td>Microsoft Email Adapter</td>
<td>Using the Microsoft Email Adapter</td>
</tr>
<tr>
<td>Microsoft SQL Server Adapter</td>
<td>Using the Microsoft SQL Server Adapter</td>
</tr>
</tbody>
</table>
### Adapter | For Information
---|---
MySQL Adapter | Using the MySQL Adapter
NetSuite Adapter | Using the NetSuite Adapter
Oracle Advanced Queuing (AQ) Adapter | Using the Oracle Advanced Queuing (AQ) Adapter
Oracle Commerce Cloud Adapter | Using the Oracle Commerce Cloud Adapter
Oracle CPQ Cloud Adapter | Using the Oracle CPQ Adapter
Oracle Database Adapter | Using the Oracle Database Adapter
Oracle Eloqua Cloud Adapter | Using the Oracle Eloqua Cloud Adapter
Oracle E-Business Suite Adapter | Using Oracle E-Business Suite Adapter
Oracle ERP Cloud Adapter | Using the Oracle ERP Cloud Adapter
Oracle Field Service Adapter | Using the Oracle Field Service Cloud Adapter
Oracle HCM Cloud Adapter | Using the Oracle HCM Cloud Adapter
Oracle JD Edwards EnterpriseOne Adapter | Using the JD Edwards EnterpriseOne Adapter
Oracle Messaging Cloud Service | Using the Oracle Messaging Cloud Service Adapter
Oracle Responsys Adapter | Using the Oracle Responsys Adapter
Oracle RightNow Cloud Adapter | Using the Oracle RightNow Cloud Adapter
Oracle Sales Cloud Adapter | Using the Oracle Sales Cloud Adapter
Oracle Siebel Adapter | Using the Oracle Siebel Adapter
REST Adapter | Using the REST Adapter
Salesforce Adapter | Using the Salesforce Adapter
SAP Adapter | Using the SAP Adapter
SAP Ariba Adapter | Using the SAP Ariba Adapter
SOAP Adapter | Using the SOAP Adapter
SuccessFactors Adapter | Using the SuccessFactors Adapter
SurveyMonkey Adapter | Using the SurveyMonkey Adapter
Twilio Adapter | Using the Twilio Adapter
Twitter Adapter | Using the Twitter Adapter

3. After you configure the connection, the Summary page appears.

4. Click **Done**, then click **Save**.

The connection information appears on the canvas, along with arrows depicting the configured operations. Because of space limitations on the canvas, names of connections that are more than 15 characters are truncated and ellipses are added. If you hover over a name, the complete name is displayed in a tool tip.
Creating Orchestrated Integrations

You can create orchestrated integrations in Oracle Integration Cloud Service that use Oracle BPEL Process Manager capabilities. Oracle BPEL Process Manager enables you to define how a business process that involves web services is executed. BPEL messages invoke remote services and orchestrate process execution. When designing your integration, you can add switch activities in your integration to create multiple routing expressions. You can create ad-hoc mappings on switch branches. You can also add callback activities (to end an integration and respond back to the sender) and end activities (to end an integration without responding back to the sender) in asynchronous integrations.

- Creating an Orchestrated Integration
- Defining Inbound Triggers and Outbound Invokes
- Defining Switch Branches
- Defining Ad-Hoc Mappings
- Importing a Map File into an Orchestrated Integration
- Assigning Values to Scalar Variables
- Using XPath Axis and Wildcard Expressions in the Expression Builder
- Using Lookups in Variable Assignments
- Assigning Business Identifiers for Tracking Fields
- Looping over Repeating Elements with a For-Each Action
- Displaying Errors and Warnings in an Integration

Creating an Orchestrated Integration

This section provides an example of how to design an orchestrated integration that includes a switch activity and multiple ad-hoc mappers.

To create an orchestrated integration:

1. In the Integration Cloud Service toolbar, click Designer.
3. On the Integrations page, click New Integration.

The Create Integration — Select a Style/Pattern dialog is displayed.
4. Select the **Orchestration** integration pattern. For more information about integration patterns, see *Understanding Integration Patterns*.

The Create New Integration dialog is displayed.

5. Complete the fields in this dialog, and click **Create**. For more information about this dialog, see *Creating an Integration*.

An empty integration canvas with the following sections is displayed:

- The **TRIGGERS** section in the upper left corner shows the type (for example, Oracle RightNow Adapter) and number of configured adapters available for adding to an integration. A trigger enables you to create an inbound connection in an integration.

- The empty integration is identified by a **START** label and **plus** sign within a circle in which you drag the trigger to define the inbound part of the integration.

- Several icons are provided in the upper right corner of the integration for adjusting the size of the integration.
  - **zoom out**: Click to decrease the size of the integration.
  - **zoom in**: Click to increase the size of the integration.
  - **zoom to fit**: Click to make the entire integration visible on the page.
  - **Home**: Click to align the integration in normal size in the upper left corner of the page.
  - **Reset the Diagram**: Click to reset the integration to its normal size and place it in the upper left corner of the page.
  - **Multiple Select**: Click and then drag the cursor around parts of the integration to select them. This action highlights the selected sections in blue.

  A box below these icons shows a scale model of the undefined integration. You can place your cursor within the box or anywhere in the canvas to move your integration. You can also drag parts of the integration (such as the switch activities) around the canvas to redraw the integration. However, the order of the integration does not change.

---

**Defining Inbound Triggers and Outbound Invokes**

To define inbound triggers and outbound invokes:

1. On the left side of the canvas, click **TRIGGERS** to expand the panel.
2. Click the adapter type to display the specific type and number of configured adapters. Synchronous, asynchronous, and fire-and-forget (no response) triggers are supported.

3. Drag the configured adapter to the large + section within the circle in the integration canvas.
   This invokes the Adapter Endpoint Configuration Wizard.

4. Complete the pages of the wizard to configure the selected adapter. For this example, an Oracle RightNow adapter is selected in which a request opportunity business object and an immediate response are configured.
   When complete, a configured trigger is displayed in the canvas. An unconfigured mapper icon (indicated by blue) is displayed in the middle. Because this trigger was configured to send a response, a return icon is displayed in green in the integration canvas. Green indicates that design is complete.

---

**Note:** Asynchronous responses are also supported. You can select the **Delayed** (asynchronous) option on the Response page in the Adapter Endpoint Configuration Wizard for the Oracle RightNow Cloud Adapter. Creating an asynchronous response creates a return (**Receive**) activity in the integration. On the left side, the **TRIGGERS** section is replaced by an **INVOKES** section that enables you to add multiple outbound invoke connections to the integration.
An **ACTIONS** section is now displayed below **INVOKES**. When expanded, this section displays the following options:

- **Assign**: Enables you to assign variables to integrations.
- **Callback**: Enables you to end a process and return to the trigger. For example, you can add a switch activity and define a branch in which you add a **Callback**. If some defined expression logic is not met, this branch is taken. The integration is stopped and the trigger receives a response indicating that the integration is not continuing.
- **For Each**: Enables you to loop over a repeating element and execute one or more actions within the scope of the for-each action.
- **Map**: Enables you to add ad-hoc mappers to the integration.
- **Return**: Enables you to return an immediate response.
- **Stop**: Enables you to terminate the integration. No response message is returned to the trigger.
- **Switch**: Enables you to add a switch activity for defining routing expression branches in the integration.

5. On the left side of the canvas, click **INVOKES** to expand the panel.

6. Click the adapter type to display the specific type and number of configured adapters.

7. Drag the specific configured adapter to the integration canvas. As you do, two large + sections within circles are displayed:
   - A section before the request mapper (this is similar to the enrichment feature that you can define in integrations that are not orchestrated).
   - A section after the request mapper.

8. Drop the adapter in the appropriate section. For this example, the invoke is added before the request mapper.
   This invokes the Adapter Endpoint Configuration Wizard.

9. Complete the pages of the wizard to configure the selected adapter. For this example, an Oracle Sales Cloud Adapter named Order with a selected business object is defined for a synchronous response.
   When complete, a configured invoke connection is displayed in the canvas. You can click the invoke connection to edit or view its contents. You can place your cursor anywhere in the canvas to move the integration as needed. You can also move the integration from within the large box in the upper right corner or click the two icons in the upper left corner to further adjust the display of the integration.
Defining Switch Branches

You can define switch branches to add routing expressions in your integration.

To define switch branches:

1. On the left side of the canvas, click ACTIONS to expand the panel.

2. Drag the SWITCH icon to the integration canvas. As you do, large + sections within circles are displayed that indicate where you can drop the switch activity. For this example, the switch activity is added immediately after the trigger connection.
Note: Nested switches are not supported. If you attempt to create a nested switch, you receive an error message at the top of the page.

Two branches are automatically created:

- Undefined (first) branch: You must define a routing expression for this branch.
- Otherwise (second) branch: This branch is taken if the routing expression for the initial branch does not resolve to true.

Note: To add more branches, click the question mark in the switch activity to invoke a menu.

3. Click the Undefined branch icon.

4. Select the Edit icon from the menu that is displayed. This invokes the Expression Builder.

5. Define a routing expression, then click Save and Exit Expression Builder. XPath version 2.0 functions are supported. For more information about the Expression Builder, see Creating Routing Expression Logic in Both Expression Mode and Condition Mode.

For this example, the following expression is defined:

```
/nssrcmpr:process/nssrcmpr:Contact_CustomObj/rnb_v1_3:LookupName = "Denver"
```

You can now define different data flows for both the defined and otherwise branches in the switch activity.

6. Return to the left side of the canvas, and click INVOKES to expand the panel.

7. Drag an adapter to the appropriate + section within the circle. Two are available: one for the defined branch and another for the otherwise branch. For this example, the section for the otherwise branch is selected.
This invokes the Adapter Endpoint Configuration Wizard.

8. Complete the pages of the wizard to configure the selected adapter.

This creates an extra invoke connection on the otherwise branch. You can use the data from this invoke connection to initiate an order with the endpoint.

Defining Ad-Hoc Mappings

As you add switches and their associated invoke connections to the switch branches, you can add ad-hoc mappers, as needed. You can also delete the mappers that were automatically created when you added your first trigger to the integration, if they are not needed.

To define ad-hoc mappings:

1. Delete any mappings that are not needed. For this example, the following mapping is deleted to create two mappings for the defined and otherwise branches that output to the order invoke connection.

2. On the left side, expand the ACTIONS section.

3. Drag a MAP icon to a branch of the switch activity. For this example, the map is first dragged to the + sign of the defined branch.
4. Select the endpoint to which to map. For this example, the Order endpoint is selected.

The mapper is displayed.

5. Map appropriate elements from the source data structure to the target data structure.

6. When complete, click Save, then click Exit Mapper.

7. Drag a MAP icon to the otherwise branch of the switch activity.

The Select Output dialog is displayed.

8. Select the endpoint to which to map, and click Select. For this example, the Order endpoint is also selected.

The mapper is displayed.
9. Map appropriate elements from the source data structure to the target data structure.

10. When complete, click **Save**, then click **Exit Mapper**.

Mappings for both branches of the switch activity are now displayed.

- The inbound trigger connection is configured with an opportunity business object.
- A switch activity is defined with two branches:
  - If the routing expression for the defined branch resolves to true, the mapping for that data is performed for the outbound invoke connection.
  - If the routing expression for the defined branch does not resolve to true, the otherwise branch is taken and the mapping for that data is performed for the outbound invoke connection.

You can click the mappers to display a menu for editing or viewing the mapper. You can also click the invoke connections to edit or view their contents.

You can make the integration as complex as is required. For example, you can:

- Add additional switches to other parts of the integration.
- Add additional ad-hoc mappings to the branches of the switches.

**Importing a Map File into an Orchestrated Integration**

You can import an XSL map file that was previously exported from the same integration. This action overwrites the existing mapping file. Once imported, the map file cannot be edited. For example, you can export the map from a specific integration, edit the XSL file as per a user requirement, save it, and import it back into the same integration. You cannot import an XSL map file into an orchestrated integration that was exported from a different integration in Oracle Integration Cloud Service or from an application in Oracle JDeveloper.
1. Right-click the map in which you want to import an integration, and select Import.

2. Browse for the map file to import, then click Import. You only import the map file of an exported integration into Integration Cloud Service. You do not import the entire integration in which the map file is included into Oracle Integration Cloud Service.

Assigning Values to Scalar Variables
You can assign values to scalar variables in orchestrated integrations using the Expression Builder.

Note: Values cannot be assigned to other variable types, such as complex types.

1. On the left side of the canvas, click ACTIONS to expand the panel.
2. Drag the ASSIGN icon to the appropriate plus sign location in the integration canvas.
3. Enter an assignment name and optional description when prompted by the Assignments dialog, then click OK.
4. Enter a name for the assignment in the Name field, then click the Expression Builder icon at the far right. Assignment names are case sensitive.
5. Build an expression, then click Exit Expression Builder. The expression is automatically saved in edit mode. For information on using the Expression Builder, see Creating Routing Expression Logic in Both Expression Mode and Condition Mode.
The expression value is displayed in the **Value** field.

6. Click the **Add** icon to add multiple assignments to the **ASSIGN** node. You can also define an assignment with a value from a previously defined assignment. In the following example, **AccountId** (the previously created assignment) is assigned as the value of assignment **AccountIdNow**.

7. Click **Exit Assignments**.

8. Click **Save**.

Variable assignments can be of greater complexity. For example, you can use assignments in switch activities and in maps. For example, in the following orchestration, the next organization ID is assigned.
1. Click the ASSIGN node. **NewOrgID** is assigned a value of \( \text{OrganizationId} + 1.0 \). **OrganizationId** is the business object that comes from the trigger element that initiates this orchestration.

2. View the switch activity in the orchestration. While **OrganizationId** is less than or equal to 15.0, another assignment is performed in **VarNodeInSwitch**.

3. Click **VarNodeInSwitch** and note that it reverts to the original value.

You can also map assignment values in the mapper.

If there is an error in your assignments, an identifier is displayed next to the ASSIGN node and also in the mapper.

**Using XPath Axis and Wildcard Expressions in the Expression Builder**

You can include XPath axis and wildcard expressions in actions that support the Expression Builder (for example, assign and switch actions support the Expression Builder).
1. Create an assign action or switch action and navigate to the Expression Builder.

2. In the Expression field for an assign or switch action, build an expression using either option:

   - **Wildcard expression:**
     For this example, a wildcard is entered to select all elements below `Answer`.
     
     `/nssrcmpr:process/nssrcmpr:Answer/*`
     
     Or, to select all elements:
     
     `/*`

   - **Axis expression:**
     For this example, `descendant` is entered to select all descendants (child, grandchildren, and so on) of the current node. Any descendant with this ID and namespace (`mb_v1_3:ID`) are retrieved by the expression.
     
     `/nssrcmpr:process/nssrcmpr:Answer/descendant::mb_v1_3:ID`

Axis expressions adhere to the following syntax:

`axisname::nodetest[predicate]`

The following table provides examples of axis expressions:

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>child::book</td>
<td>Selects all <code>book</code> nodes that are children of the current node.</td>
</tr>
<tr>
<td>attribute::lang</td>
<td>Selects the <code>lang</code> attribute of the current node.</td>
</tr>
<tr>
<td>child::*</td>
<td>Selects all element children of the current node.</td>
</tr>
<tr>
<td>attribute::*</td>
<td>Selects all attributes of the current node.</td>
</tr>
<tr>
<td>child::text()</td>
<td>Selects all <code>text</code> node children of the current node.</td>
</tr>
<tr>
<td>child::node()</td>
<td>Selects all children of the current node.</td>
</tr>
<tr>
<td>descendant::book</td>
<td>Selects all <code>book</code> descendants of the current node</td>
</tr>
<tr>
<td>ancestor::book</td>
<td>Selects all <code>book</code> ancestors of the current node.</td>
</tr>
</tbody>
</table>
### Syntax

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>ancestor-or-self::book</td>
<td>Selects all <code>book</code> ancestors of the current node and the current if it is a <code>book</code> node.</td>
</tr>
<tr>
<td>child::*/child::price</td>
<td>Selects all <code>price</code> grandchildren of the current node.</td>
</tr>
</tbody>
</table>

For more information about using axis expressions, see [XPath Axes](#).

3. Click the **Expression Summary** icon to validate the expression.

4. When complete, click **Exit Expression Builder**.

#### Using Lookups in Variable Assignments

You can create variable assignments that use lookups in the Expression Builder.

1. Create a lookup in Integration Cloud Service. For information, see [Creating Lookups](#).
   
   For this example, a lookup named `ZIP_CITY_DVM` is created to map the ZIP codes (using a SOAP Adapter) and the city names (using a domain name).

<table>
<thead>
<tr>
<th>SOAP (Adapter)</th>
<th>SOAPCITY (Domain Name)</th>
</tr>
</thead>
<tbody>
<tr>
<td>80112</td>
<td>Englewood</td>
</tr>
<tr>
<td>85003</td>
<td>Phoenix</td>
</tr>
<tr>
<td>80007</td>
<td>Arvada</td>
</tr>
<tr>
<td>80220</td>
<td>Denver</td>
</tr>
</tbody>
</table>

2. Create an orchestration into which a SOAP Adapter is added as the trigger.

3. Drag the **ASSIGN** icon to the **plus** sign for the SOAP Adapter in the integration canvas.

4. Enter an assignment name and optional description when prompted by the Assignments dialog, then click **OK**.

5. Enter a name for the assignment in the **Name** field, then click the **Expression Builder** icon at the far right.

6. In the Expression Builder, expand **Functions > ICS**.

7. Drag the **lookupValue** function to the **Expression** field.
   
   This starts the Build Lookup Function wizard.

8. Select the lookup table, and click **Next**. For this example, the lookup created in Step 1 (`ZIP_CITY_DVM`) is selected.

9. Select the source and target columns. For example, select to pass the city to the ZIP code.
10. Complete the remaining pages of the wizard, then click **Done**.

11. In the **Source** tree, select the element to map. For this example, **ZIP** is dragged on top of **srcValue** in the **Expression** field.

12. Click **Exit Expression Builder**.

The completed variable assignment is displayed.

13. Click **Exit Assignments**.

14. In the orchestrated integration, click the **mapper** icon, then click the **Edit** icon.

15. Assign the variable you created to the city, then click **Save**.

16. Click **Exit Mapper**.
Assigning Business Identifiers for Tracking Fields

Business identifiers enable you to track payload fields in messages during runtime. You must assign business identifiers before you can activate an orchestrated integration.

1. Click the Tracking icon in the upper right part of the page to assign business identifiers for tracking fields. For more information, see Assigning Business Identifiers for Tracking Fields in Messages.

2. When complete, click Done.

3. When the orchestrated integration is complete, click Save, then click Exit Integration.

4. Activate your integration. For more information, see Activating an Integration.

5. Manage and monitor your integration. For more information, see Monitoring Integration Cloud Services and Tracking Business Identifiers in Integrations During Runtime.

Looping over Repeating Elements with a For-Each Action

The for-each action enables you to loop over a repeating element and execute one or more actions within the scope of the for-each action. The number of loop iterations is based on a user-selected repeating element. For example, you may have an integration in which you have downloaded a number of files and want to loop over the output of the files. The for-each action enables you to perform this task.

1. On the left side of the canvas, click ACTIONS to expand the panel.
2. Drag the **For Each** icon to the plus sign where you want to loop over an element. The For Each dialog is displayed.

3. Expand the **Source** tree to select an element.

4. Drag a repeatable element to the **Repeating Element** field. This is the element over which to loop.

**Note:** Note the following restrictions:

- The selected element must be repetitive. You can identify repetitive elements by the two-bar icon to the left of the element name.

- Any parent of the selected element must not be repetitive.

- The data type of the selected element must be scalar.

- Global and nonglobal repeated elements can be selected.

- If we have a repeating element within another repeating element (that is, a list within a list), you must first create a for-each action and loop over the parent list. This gives you access to the child list during every iteration. You can then create a second for-each action within the scope of the first for-each action and loop over the child list.

For this example, the element over which to loop is **ICSFile**.

5. Enter a name in the **Name** field and an optional description of the action in the **Description** field.

For every iteration of the loop, there is a single reference to the repeating element (**ICSFile**). A current element name file is required for this to occur.

6. Enter an alias for the current file of the iteration in the **Current Element Name** field.

7. Click **Done**.
The for-each action is displayed in the canvas. A looping arrow indicates that this action performs repetitive looping.

8. Drag other actions inside the for-each action to define what should happen during each iteration of the loop. For this example, an assign action is dragged to the Plus sign below the for-each action.

   Enter a name for the assign action, and click OK.

9. Click the Edit icon.

   The Expression Builder is displayed. Note that the value you entered in the Current Element Name field in Step 6 (currentFileName) is displayed as an expandable element in the Source tree.

10. Expand $currentFileName in the Source tree.

    The repeatable element you added in Step 5 (ICSFile) is displayed.

11. Drag the ICSFile element to the Expression field, and click Exit Expression Builder.

12. In the Assign dialog, enter a variable name in the Name field, and click Exit Assignments.

    The assign action is added to the scope of the for-each action. After integration activation, the for-each action loops over the assign action for each downloaded file.

### Displaying Errors and Warnings in an Integration

If there are errors or warnings in an integration (for example, an empty or invalid map, a missing tracking attribute, or an invalid assign or switch action), an ERRORS section is displayed on the left side. These errors and warnings prevent you from activating an integration. You must first resolve these issues to activate an integration.
Creating Integrations

Note:

- For integrations created prior to version 16.4.5, you must first save the integration once to enable error and warning validation functionality.
- Error and warning validation of for-each actions is not supported.

1. Design an orchestrated integration.
   
   If there are errors or warnings, an ERRORS section is displayed on the left side.

2. Click the ERRORS section to display error and warning details. For this example, an invoke adapter was deleted for which mapping had previously been configured, causing the mapper to be invalidated. In addition, tracking is not configured.

3. If you return to the Integrations page, note that the status of the integration is DRAFT. You cannot activate integrations in the DRAFT state.

4. Return to the integration canvas and resolve any errors and warnings. Once these issues are resolved, the ERRORS section disappears.

5. Save the integration and return to the Integrations page. Note that the DRAFT status is replaced with PENDING ACTIVATION. You can now activate the integration.

Creating an Integration to Publish Messages to Integration Cloud Service

You can create integrations that enable you to publish messages to Integration Cloud Service. Message publishing is accomplished through use of Integration Cloud Service Messaging.
To create an integration to publish messages to Integration Cloud Service:

**Note:** Integration Cloud Service Messaging supports messages of up to 10 MB.

1. Select **Publish To ICS** in the Create Integration — Select a Pattern dialog, as described in Creating an Integration.

2. Complete the fields of the New Integration — Information dialog, as described in Creating an Integration.

   This creates an integration pattern with a predefined Integration Cloud Service Messaging invoke that enables you to publish messages to Integration Cloud Service.

3. In the integration designer, drag an adapter from the Connections panel on the right to the trigger (source) area on the canvas. For this example, an Oracle Sales Cloud Adapter is selected.

   The wizard for the Oracle Sales Cloud Adapter is displayed.

4. On the Basic Info page, enter an endpoint name and optional identifier for this connection. See Configuring Basic Information Properties for instructions.

5. Click **Next**.

6. On the Request page, select a business object (for this example, **Account** is selected), then click **Next**.

7. On the Response page, select **None** as the response type, then click **Next**.

8. On the Summary page, click **Done**.

   The Oracle Sales Cloud Adapter is configured to publish messages to Integration Cloud Service through use of Integration Cloud Service Messaging. Note that there is no request mapper available with this type of integration pattern.

9. Click **Save**, then click **Exit Integration**.

   To subscribe to the message configured in this section, you must now configure Integration Cloud Service to act as a publisher. This enables Integration Cloud Service to publish the messages to which other adapters can then subscribe. For instructions, see Creating an Integration to Subscribe to Integration Cloud Service.

---

**Creating an Integration to Subscribe to Integration Cloud Service**

You can create integrations that enable you to subscribe to messages from Integration Cloud Service. Message subscription is accomplished through use of Integration Cloud Service Messaging.
To create an integration to subscribe to Integration Cloud Service:

1. Complete the steps in section *Creating an Integration to Publish Messages to Integration Cloud Service* to first configure Integration Cloud Service as a subscriber to messages from an adapter.

2. Select **Subscribe To ICS** in the Create Integration — Select a Pattern dialog, as described in *Creating an Integration*.

3. Complete the fields of the New Integration — Information dialog, as described in *Creating an Integration*. This creates an integration pattern with Integration Cloud Service Messaging that enables you to subscribe to messages from Integration Cloud Service.

   The Select a Publisher dialog is displayed.

4. Select the integration to which to subscribe, then click **Use**. For an integration to be displayed for selection, you must first configure Integration Cloud Service as a subscriber, as described in *Creating an Integration to Publish Messages to Integration Cloud Service*. Only integrations that are 100% completed and unlocked are displayed. Integrations that are locked (meaning that they are being edited) are not displayed.

5. Drag an adapter to the invoke (target) area of the integration designer. For this example, an Oracle RightNow Cloud Adapter is added.
6. On the Basic Info page, enter a name and optional identifier for this connection. See Basic Info Tab Properties for instructions.

7. Click Next.

8. On the Operations page, select an appropriate operation and business object, then click Next. For this example, a CRUD Create operation and Organization business object are selected.

9. On the Summary page, review your changes, then click Done.

   The request mapper is available with this type of integration pattern.

10. Click the Request Mapping icon, then click Create.

11. Map source fields to the corresponding target fields. For information, see Mapping Data of Using the Oracle Mapper.

12. When complete, click Save, then click Exit Mapper.

   The Oracle RightNow Cloud Adapter is configured to subscribe to messages from Integration Cloud Service through use of Integration Cloud Service Messaging.

13. Click Save, then click Exit Integration.

14. Activate the publishing integration described in Creating an Integration to Publish Messages to Integration Cloud Service and the subscribing integration described in this section. For instructions, see Activating an Integration.

   The completed publishing and subscription integrations enable you to:
   
   • Create an object in one application that causes the object to be created in other applications.
   
   • Enable multiple applications to subscribe to Integration Cloud Service and be registered for updates.
   
   • Enable additional subscribers to be added or removed without impacting other subscribers or publishers.
Business identifier tracking data is copied when a subscriber is created. If a publishing integration is updated later, you must update the subscribing integration.

For example, assume you create a publishing integration, then create a subscribing integration and select to subscribe to the publishing integration. Select the Tracking icon, and note that the tracking attributes of the selected publishing integration are displayed. Assume you then edit the publishing integration and change the operation of the trigger adapter (as an example), save, and exit the canvas. If you then edit the subscribing integration and click the Tracking icon, note that the business identifier tracking attributes of the publishing integration that are displayed are those that existed before the updates were made. The tracking fields are not updated as per the updated publisher integration. This is the expected behavior.

**Adding Request and Response Enrichments**

When you create an integration, you also have the option of adding both request and response message enrichment points to the overall integration flow. Enrichments participate in the overall integration flow and can be used in the request and/or response payloads between the trigger and invoke.

To add request and response enrichments:

1. Design an integration with trigger and invoke connections and request and response mappings. For this example, the integration looks as follows when complete. Note the two enrichment point circles in the design; one appears on the inbound (request) side and the other appears on the outbound (response) side.

   ![Integration Diagram](image)

   The request and response mappings for this example are as follows:

<table>
<thead>
<tr>
<th>Mapping</th>
<th>Source</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Request</td>
<td>HelloRequest/FirstName</td>
<td>sayHello/name</td>
</tr>
<tr>
<td>Response</td>
<td>sayHelloResponse/sayHelloReturn</td>
<td>HelloResponse/Greeting</td>
</tr>
</tbody>
</table>

You are now ready to add enrichments to the integration. For this example, a response message enrichment is added to the Drag and drop an enrichment source for the response message area. You can also add request message enrichments on the request (inbound) side.
2. From the Connections panel on the right, drag an adapter to the enrichment area on the response message shown below.

For this example, a SOAP Adapter is dragged to the **Drag and drop an enrichment source for the response message** area. This action invokes the wizard for configuring the SOAP Adapter.

3. Complete the pages of the wizard to configure the SOAP Adapter, then click **Done**. For this configuration, a different operation for selecting timestamp details is chosen.

You are prompted with a dialog to delete any impacted response mappings that you previously configured for the response mapper. The response mapper requires updates because of the enrichment response adapter configuration you just performed.

4. Click **Yes**. You recreate the response mappings later in these steps.

5. Click **Save**.

A SOAP Adapter icon and response enrichment mapper are added to the response side of the integration. Note that because you deleted the response mappings in the previous step, that icon is no longer shaded in green. This indicates that the response mapper requires configuration.

6. Click the **Response Enrichment Mapping** icon between the trigger and invoke.
7. Click the **Create** icon that is displayed. This invokes the mapper.

8. Map source elements to target elements to include a timestamp with the response, then click **Save** when complete.

   The response enrichment mappings are as follows:

<table>
<thead>
<tr>
<th>Mapping</th>
<th>Source</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Enrichment</td>
<td>sayHelloResponse/</td>
<td>visitTimestampReq &gt;</td>
</tr>
<tr>
<td></td>
<td>sayHelloReturn</td>
<td>reqMsg</td>
</tr>
</tbody>
</table>

   The **Response Mapping** icon is displayed in green, indicating that it has been configured.

9. Click the **Response Mapping** icon to invoke the mapper again. This mapper requires updates because of the enrichment response mapping you performed.

10. Remap the source elements to target elements in the response mapper.

    The response mappings are updated. Note that a different source is now mapped to the original target of HelloResponse/Greeting.
The **Response Enrichment Mapping** icon is displayed in green, indicating that it has been reconfigured.

**11.** Click **Save**, then click **Exit Mapper** when complete.

The integration with response enrichments added to the invoke (target) area looks as follows:

![Diagram of integration flow]

**12.** Click **Save**, then click **Exit Integration** when complete.

You are ready to activate the integration. While not demonstrated in this example, you can also configure the enrichment area on the request message shown below by dragging and dropping an adapter to the **Drag and drop an enrichment source for the request message** area. This invokes the adapter configuration wizard.

![Diagram of request message enrichment]

You can also update existing enrichments at a later time, such as the objects selected in the adapter configuration wizard and the enrichment mappings.

For more information about enrichments, see **About Integration Cloud Service Enrichments**.

### Deleting Request and Response Enrichments

You can delete the request and response message enrichment point mappings added to an integration. After deleting the enrichment point mappings, the integration is returned to its original pre-enrichment state.

To delete request and response enrichments:

1. On the Integration page, select the integration. The integration must not be active.
2. Click the enrichment area on the request message or response message to delete.
3. Select the **Delete** icon that is displayed.
   
   This deletes the mappings.
4. Click **Yes** when prompted to confirm.
Click **Save**, then click **Exit Integration**.

For more information about enrichments, see *About Integration Cloud Service Enrichments*.

**Creating Routing Paths for Two Different Invoke Endpoints in Integrations**

You can create an integration in which you define routing paths for two different invoke endpoints. During runtime, the expression filtering logic for the routing paths is evaluated and, based on the results, the path to one of the invoke endpoints is taken. If the filtering logic for neither routing path is satisfied, then neither invoke endpoint is contacted.

The expression logic works as follows:

- You define an expression filter on the first (upper) invoke endpoint.
- You define either an ELSE condition or an expression filter on the second (lower) invoke endpoint.

During runtime, if the expression filtering logic for the first (upper) invoke endpoint evaluates to true, then the path to that invoke endpoint is taken. If the expression evaluates to false, then that invoke endpoint is skipped, and the path to the second (lower) invoke endpoint is taken through either an ELSE condition or an expression filter.

In addition to creating routing paths, you also define request and response (and optionally, enrichment) mappings on both invoke endpoints.

To create routing paths for two different invoke endpoints in integrations:

1. On the Integrations page, select the integration in which to define a routing filter. Ensure that the integration is fully defined with trigger and invoke connections, business identifier tracking, and mappings.

2. Click the **Filter** icon on the trigger side of the integration to create a filtering expression. Routing is created after any defined request enrichment and before the initial request mapping.

3. Click the **Routing** icon in the menu that is displayed.

   The Expression Builder is displayed for building routing expressions. The Expression Builder supports multiple source structures. You can create OR expressions using both source structures. You can also name expressions and calculate expression summaries with the **Expression Summary** icon. Elements and attributes with and without namespace prefixes are also supported.

   You can filter the display of source structures by clicking the **Filter** link. This enables you to filter on whether or not fields are used and on the type of field (required fields, custom fields, or all fields). You can also select to filter both required and custom fields together.
4. Drag an element from the **Source** area to the **Expression** field.

5. Define a value.

   For this example, the **ClassificationCode** element is defined as equal to **Org**. This means that **Org** is retrieved when this expression evaluates to true.

6. If you want to calculate the expression, click the **Expression Summary** icon. This shows the summary of the expression and defines a more user-friendly, readable version of the expression you just created.

7. If that name is not sufficiently user-friendly, copy and paste the expression to the **Expression Name** field for additional editing.

8. Click **Save**, then click **Exit Expression Builder**.

   The defined expression is displayed above the integration. The **Filter** icon has now changed to indicate that an expression is defined.

9. On the right side of the integration, click the **Routing Drawer** icon to display a graphical routing diagram with two potential paths. The first route that you just defined (the upper trigger and invoke) shows the defined expression above the line. The second route (the lower trigger and invoke) is displayed as a dotted line because it is not yet defined.
You can activate the integration now if additional filtering is not required or define an additional routing filter. For this example, a second route is defined.

10. Click the bull’s eye icon in the lower trigger icon to define routing on the second trigger and invoke route.

![Diagram showing routing and invoke route](image)

This refreshes the integration to display the lower trigger and invoke route in the integration. The trigger side remains as defined for the first route, but the invoke route is undefined.

11. Click **Show Palette** to display the list of available connections and technologies.

12. Drag an adapter to the invoke (target) area of the integration (for this example, an Oracle RightNow adapter is added).

   The Adapter Configuration Wizard is invoked.

13. Configure the pages of the wizard for the Oracle RightNow adapter. For this example, the **Get** operation and **Account** business object are selected on the Operations page.

![Oracle RightNow Adapter Configuration Wizard](image)

The integration is now defined for the second invoke. You now need to create a filtering expression for the second invoke.

14. Click the **Filter** icon to create a filtering expression.

15. If no additional expression is required, click the **E** icon (to create an ELSE condition).
This defines an ELSE condition for the second trigger and invoke. The ELSE condition is taken if the first route evaluates to false (that is ClassificationCode does not equal Org). You can toggle back and forth between the two trigger routes by clicking the adapter icon on the individual line. The line in blue is the currently visible invoke in the integration.

16. If you want to define your own expression filter for the second route instead of using the ELSE condition, perform the following steps:

   a. Click the Filter icon.
   
   b. Select Clear Expression to remove the ELSE condition.
      
   c. Click Yes when prompted to confirm.
   
   d. Click the Filter icon again and select the Edit icon to invoke the Expression Builder as you did in Step 3.
   
   e. Define an expression.
   
   f. Click Save, then click Exit Expression Builder.

      Request and response mappings must now be defined.

17. Click the Request Mapper icon to define the mapping.

      For this example, the following mapping is defined.
18. Click the **Response Mapper** icon to define the mapping.

For this example, the following mapping is defined.

<table>
<thead>
<tr>
<th>Source</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>process &gt; Organization &gt; Organizationid</td>
<td>Get &gt; Account &gt; ID &gt; id</td>
</tr>
</tbody>
</table>

Integration design is now 100% complete.

19. Activate the integration.

**Creating Routing Expression Logic in Both Expression Mode and Condition Mode**

You can create XPath expressions for routing conditions in two different user interface modes:

- **Expression mode:** This mode provides an interface for creating and viewing the entire XPath expression.

- **Condition mode:** This mode provides an easier-to-read interface to create and view XPath condition expressions. This mode is useful for business analysts who may be less experienced with XPath expressions.

You can toggle between expression mode and condition mode when creating and viewing your expressions. Elements and attributes for which mapping is required are identified by a blue asterisk (*) to the left of their names. You can also place your cursor over elements and attributes to display specific schema details such as the data type, if mapping is required, and so on. When creating an expression, note the following functionality in the tree:

- Three levels of elements are loaded by default in the tree in the **Source** area. When you reach the third level, a **Load more** link is displayed. Click this link to display all the direct children of that element. Only base types are loaded automatically. To load the extended types of the base type, click the base type, which is identified by a unique icon. This invokes a menu of extended types that you can select to load one by one into the tree.
• Elements in the tree in the Source area that you have already dragged to an expression are identified by green checkboxes. These elements are displayed even if they are deeper than three levels in the tree.

• You can search for an element that is not yet loaded in the tree by entering the name in the Find field and clicking the Search icon. This action loads that specific element into the tree.

This section provides an example of building an expression using both modes.

To create routing expressions in both expression mode and condition mode:

1. Click the Filter icon on the source side of an integration to create a filtering expression.

2. Click the Routing icon in the menu that is displayed.

The Expression Builder is displayed for building routing expressions. Expression mode is the default mode.

3. In the field immediately below Expression Name, optionally enter a short description about the expression you want to build.

4. Add an element from the Source area on the left side to the expression field immediately below the short description field. If needed, you can also add functions from the Components section.

There are two ways to add an element to the expression field:

a. Drag the element from the Source area.

b. Select the row of the element in the Source area, then click the Move icon in the middle of the page to move the element.
The expression for the selected element is displayed in the expression field (for this example, the expression for the Country element was added). The selected element is identified by green checkbox in the Source area.

5. To the right of the added expression, define an operator and a value within single or double quotes (for this example, = “USA” is defined).

6. Click the Expression Summary icon to view a simplified, user-friendly version of the expression. Easy-to-read output is displayed.

Note:

- To add additional elements to the expression, you can place your cursor in the exact location of the expression, select the row of an element in the Source area, and click the Move icon. These actions add that element to the exact location of your cursor.

- You can drag an element to the exact location of your cursor in the expression, and the expression of the element is added to the cursor location, and not the location in which you drop the element.

- You can drag an element on top of an existing expression element to replace it.

7. In the upper right corner, click Condition Mode to view the expression you created in condition mode. Condition mode provides an easy-to-read interface for creating and viewing your expressions.

Note the following details about accessing condition mode:
• Condition mode can only be accessed if the expression field is empty or completely defined with an expression that returns true or false. If you only partially define an expression (for example, you drag an element to the expression field, but forget to define expression logic and a value such as \(= "USA"\)), you receive an error saying that you must provide a valid condition to access condition mode.

• The Condition Mode button toggles to Expression Mode.

**Note:** At any time, you can click Expression Mode to view the entire XPath expression.

8. Click the expression.

   ![Expression Name](image)
   
   Route to correct country
   
   Country = "USA"

This refreshes the page to display icons for adding additional conditions and conditions groups. Groups enable you to combine multiple conditions into a single logical expression.

9. Click the Add Condition icon (first icon) to add additional condition expressions.

   ![Expression Name](image)
   
   /nsscompr:process/nsscompr:Account/nro_v1_3:Country
   
   =
   "USA"

   This creates an additional field for entering additional expression logic. The message Drag and drop or type here is displayed in this field.
10. Drag an element from the Source area to the first Drag and drop or type here field (for this example, the Country element is again added).

11. Select an operator (for example, =, >, !=, and so on) and enter a value (for this example, "Mexico" is added).

12. From the Match list, select an option. This list is hidden until at least two conditions are defined.
   
   • Any of: Select if any of the added expressions must be true. This equates to an OR condition in the entire XPath expression shown in expression mode.
   
   • All of: Select if all expressions must be true. This equates to an AND condition in the entire XPath expression shown in expression mode.

13. Select the Add Group icon (second icon) to group a series of conditions. This option enables you to build a number of conditions within a single group. The group is identified by the gray outline and the indentation.
14. Add an element from the **Source** area.

   For this example:

   - The **DisplayName** element is added to the first **Drag and drop or type here** field.
   - The not equal operator (!=) is selected.
   - The **Country** element is added to the second **Drag and drop or type here** field.

15. Click the **Add Condition** icon (first icon) to add an additional condition expression within the group.

   For this example:

   - The **DisplayOrder** element is added to the first **Drag and drop or type here** field.
   - The less than operator (<) is selected.
   - A value of 10 is entered in the second **Drag and drop or type here** field.

16. Continue building your group condition, as necessary.

   When complete, the expression is displayed. For this example, there are the conditions: if **Country** is **USA** OR **Country** is **Mexico** OR **DisplayName** does not equal country and **DisplayCount** is less than 10, the integration continues.
17. Click **Expression Mode**.

Note the entire XPath expression and the expression summary at the bottom. The selected elements are displayed (no matter their level of depth in the tree) and identified by green checkboxes in the **Source** area.

18. If you want, you can place your cursor in the XPath expression and edit it as necessary (for example, change USA to Canada), then click the **Expression Summary** icon to refresh the calculation. If you make an error when editing the XPath expression (for example, forget to add a double quote to a value), an error message is displayed.

19. Click **Save** to view the expression in read-only mode. You can also click **Done Editing** at any time during the creation process to view the expression in read-only mode.

20. Click **Exit Expression Builder** to return to the integration. The user-friendly expression is displayed in the blue banner above the integration.
Deleting Routing Paths

You can delete routing paths that have been created on different target endpoints in an integration.

There are two methods for deleting routing paths:

- Delete the routing path and expression filter.
- Delete the endpoint and routing path, but retain the expression filter.

Deleting the Routing Path and Expression Filter

To delete the routing path and expression filter:

1. In the Integrations page, select the integration in which to delete a routing path.
2. Expand the Routing Drawer icon to display the diagram of routing paths.
3. Above the integration, select the routing path to delete.
4. Click the Filter icon.
5. Select Delete Route from the menu that is displayed.
6. Click Yes when prompted to confirm.

This action deletes the routing path, including the expression filter and the request mapping for the selected path. The diagram above the integration shows that the routing path is deleted.

Deleting the Endpoint and Routing Path

To delete the endpoint and routing path:

1. In the integration, click the target endpoint to delete.
2. Click Delete in the menu that is displayed.
3. Click Yes when prompted to confirm.

This action deletes the target endpoint and routing path. The diagram above the integration shows that the routing path is deleted. Within the integration, only the expression remains defined in the integration because it is not using anything from the deleted target endpoint.

Editing the Endpoint Information in an Integration

You can edit the endpoint information in an integration that is not active. The changes that you make can impact your mappings. For example, minor edits such as changing
the endpoint description do not delete the existing mappings. Major edits such as changing the selected business objects or operations delete the mappings. In these cases, you must recreate your mappings. Before you save your updates, you are prompted to confirm your changes.

The impact of major and minor endpoint changes on an integration are as follows:

- If a minor change is detected, for example:
  - If a map is using either the request or response of the application as a primary input, output, or secondary input, the map is validated.
  - If a map is using a fault of the application as a primary input or output, the map is deleted.
  - If a map is only using a fault of the application as a secondary input, the secondary input is removed.

- If a major change is detected, for example:
  - If a map is using a request, response, or fault of the application as a primary input or output, the map is deleted.
  - If a map is only using a request, response, or fault of the application as a secondary input, the secondary input is removed.

The following are examples of major endpoint changes:

- If the application message exchange pattern changes (for example, from synchronous to asynchronous).
- If a root element name or root element namespace of the input request changes.
- If a root element name or root element namespace of the output response changes.

If none of the above changes occur, then the change is considered minor.

1. In the Integration Cloud Service toolbar, click **Designer**.
2. On the Designer Portal, click **Integrations**.
3. Select the integration to edit.
4. In the integration, select the trigger or invoke endpoint to edit, then click the **Edit** icon.
5. Make appropriate changes in the Adapter Endpoint Configuration Wizard, then click **Done**.
6. Select to confirm your changes when prompted. Minor edits do not delete your mappings. Major edits delete your mappings.

**Mapping Integration Cloud Service Data**

Use the mapper to drag fields from the source structure to the target structure to map elements between the two.

**Topics**

- Creating Mappings
• Modifying Mappings
• Deleting All Mappings
• Mapping Faults
• Adding Customized Mappings to Prebuilt Integrations
• Removing Customized Mappings from Prebuilt Integrations
• Regenerating a WSDL File for Integrations

For information on using the mapper, see Mapping Data of Using the Oracle Mapper.

Creating Mappings

You can map fields directly from the source data structure to the target data structure in the mapper.

To create mappings:

1. In the middle of the integration, click the Mapper icon for the request, response, or fault map to edit.

2. Click Create.

3. To map fields directly, perform one of the following steps:
   a. Click a field in the source and drag it to the corresponding field in the target.
   b. Click the source and the target fields, and then click Map+.

   The name of the source field appears in the target Mapping column, and a green check mark icon appears next to both fields. The most recently mapped fields are connected by a green line. Click the green check mark of other sources and targets to see their current mappings. You cannot drag and drop onto a target that is already mapped.
Modifying Mappings

Once you create a mapping in an integration, you can return to the mapping and make any necessary changes to how you mapped your data. The integration in which you want to edit the mappings cannot be active.

To modify a data mapping:

1. In the middle of the integration, click the Mapper icon for the request, response, or fault map to edit.
2. Click Edit to invoke the mapper.
3. Make appropriate updates to the mappings.
4. When complete, click Save, then click Exit Mapper.

For information on using the mapper, see Mapping Data of Using the Oracle Mapper.

Deleting All Mappings

You can delete all mappings in the mapper. This action deletes all source-to-target mappings in the mapper and all mapper statements created in the Mapping Builder.

1. Click the Mapper icon in the middle of the integration for the map to delete. For this example, the request mapper is selected, but you can also delete all mappings in another mapper, such as the response mapper, or any request or response enrichment mapping you created.
2. Click **Delete**.

3. Click **Yes** when prompted to confirm.

   The green shading is removed from the mapper, indicating that the mapper is now empty.

   For information on using the mapper, see Mapping Data of *Using the Oracle Mapper*.

**Mapping Faults**

You can map portions of a message into the fault message to compose a description that helps you understand the fault.

To map a fault:

1. Click the **Fault Mappings** icon in an integration.

2. For each fault type, do the following:
   
   a. Under **Route To**, select the type of fault.
   
   b. Under **Map**, click the **Mapper** icon of the fault map to perform mapping.
The mapper appears with the source fault data structure on the left and the target fault data structure on the right. When returning from the mapper, the map icon changes color to indicate it is complete.

3. Once you create a mapping in an integration, click **Save** in the toolbar.

4. Return to the mapping to make any necessary changes to how you mapped your data.

For information on using the mapper, see Mapping Data of *Using the Oracle Mapper*.

### Adding Customized Mappings to Prebuilt Integrations

It is a common practice to customize the application endpoints of the prebuilt integrations that you import into Integration Cloud Service from the Oracle Marketplace (for example, adding custom fields). As a result, you must customize the integration mappings to take advantage of these custom fields. Integration Cloud Service enables you to customize the mappings in the prebuilt integrations that you import from the Oracle Marketplace. This action creates a customized mapping layer on top of the base mapping file, which is not modified. You can only add customized mappings to prebuilt integrations imported from the Oracle Marketplace, and not to integrations you or another user created.

To add customized mappings to prebuilt integrations:

1. In the Integration Cloud Service toolbar, click **Designer**.

2. Click **Integrations**.

   The Integrations page is displayed.

3. Locate the name of the prebuilt integration to customize. Prebuilt integrations are designated with the words **BUILT BY ORACLE** to the right of the integration name.
4. From the menu at the far right of the integration name, select Customize.

The message Customizing... is displayed above the integration.

If the existence of more than one customized version of the same prebuilt integration is detected, a dialog is displayed that shows a list of versions from which to copy customizations. You can select a version and click Apply, or select Skip to bypass the copying of customizations and create your own customizations in the mapper, as described in the steps below.
5. Click the icon for the type of mapping you want to customize. You can customize request, response, fault, enrichment source, and enrichment response mappings. An icon for customizing the selected mapper is displayed.

6. Click Customize.

The mapper is displayed in customization mode.

7. Drag and drop source fields to target elements.

Blue dots are added to the left of the mapped target elements in the **Mapping** column to indicate that these are customized mappings. These mappings are added to a customized layer on top of the base mapping file, which is not modified. This dot differentiates the customized mappings from the regular mappings created as part of the prebuilt integration, which are displayed without a blue dot.

8. Click Save, then click Exit Mapper.
A blue dot with the words **Customized Response Mapping** is displayed in the lower right corner of the icon for the customized mapper (for this example, the response mapper was customized). The other mappers do not have a blue dot because they were not customized (for this example, the request, fault, and request enrichment mappers).

For information on using the mapper, see Mapping Data of *Using the Oracle Mapper*.

**Removing Customized Mappings from Prebuilt Integrations**

You can remove the customized mappings that you added to prebuilt integrations that you imported from the Oracle Marketplace. You can remove all customized mappings or specific subsets of mappings (for example, request, response, faults, enrichment source, or enrichment response mappings).

To remove customized mappings from prebuilt integrations:

1. In the Integration Cloud Service toolbar, click **Designer**.

2. Click **Integrations**.

   The Integrations page is displayed.

3. Locate the prebuilt integration in which you want to remove the customized mappings. Prebuilt integrations that have been customized are designated with the words **BUILT BY ORACLE** and **Customized** to the right of the integration name.

4. Click the integration name.

   You can remove all customized mappings added to the integration or specific subsets of mappings (for example, request, response, fault, request enrichment, or response enrichment mappings).

5. To remove all customized mappings from the integration, perform the following step:

   a. Click **Remove All Customizations** in the upper right corner.
6. To remove specific subsets of request, response, fault, request enrichment, or response enrichment mappings, perform either of the following steps:

a. Click the mapper icon, then click **Remove Customizations** for the customized mapping to delete (for this example, the customized response mapping is selected).

or

a. Click the mapper icon, then click **Customize** to access the specific mapper.

b. Click **Remove Customizations** in the upper right corner of the mapper page.

7. Click **Yes** when prompted to confirm your selection.

   This action removes the specific customized mappings in the integration. Note that the blue dots that previously identified the customized mappings are removed. The existing mappings that are part of the original prebuilt integration are not removed.

**Regenerating a WSDL File for Integrations**

After you clone an integration, customize a prebuilt integration, or import an existing integration into Integration Cloud Service, you update the connection information
(WSDL, username. and password) according to the requirements of your integration environment. If the connection WSDL you specify contains any custom fields or if the connection WSDL is updated with a different version, they are not displayed in the mapper. To get custom fields or updated fields to appear in the mapper, you must regenerate the endpoint in Oracle Integration Cloud Service.

As an example, you may have a scenario in which the WSDLs with one of your connections (for example, a Salesforce connection) change frequently and you must be able to uptake the latest WSDLs into your integrations. By regenerating the WSDL file, the custom fields of imported mappings are not deleted, and are available for editing, as needed. This eliminates the need for remapping source and target elements completely from scratch in the mapper.

**Restrictions**

- There cannot be root level differences between the old and new WSDLs. If there are differences, WSDL regeneration fails. Therefore, you can change the connection information, but must ensure that the new WSDL does not have root element differences from the previous WSDL.

- If you create an integration in which the Oracle RightNow Adapter WSDL is version 1.2 and try to regenerate it with Oracle RightNow Adapter WSDL version 1.3, a mapper error occurs.

- JCA artifacts are not regenerated.

- A new WSDL can have references to a different schema with different data structures (for example, you change the schema by adding, modifying, or deleting a new complex element to the root element), *only if the root element within the schema does not get modified, added, or removed.* In this situation, the child element within the root element can be changed or refer to any new data structure or data type.

  The regeneration logic follows the reference and imports or includes the new data structure to the new WSDL. The root element within the schema is the first level of `<xs:element/>` or type element (`<xs:complexType/>` or `<xs:simpleType/>`). For the first level of `<xs:element/>`, the following applies:
  - Their QName cannot be modified.
  - A new root element cannot be added.
  - The old root element cannot be removed.

For the first level of a type element, the following applies:
  - Their QName should not get changed.
  - The old root type should not be removed.
  - A new type element can be introduced by other referencing child elements or types.

For example, one child element or type defined in a root element can refer to a new type element. The regeneration logic imports or includes them into the existing schema if it has the same target namespace as the child element/type or by creating a new schema if it has a different target namespace from the child element/type.
The new root level type element must be referenced by another child element/type. If it is a standalone root type element, it does not get imported or included in the final regeneration WSDL.

To regenerate a WSDL file for integrations:

1. In the Integration Cloud Service toolbar, click Designer.
2. Click Integrations.

   The Integrations page is displayed.

3. Click the name of the integration in which to regenerate the WSDL. Customized integrations are designated with the words BUILT BY ORACLE and Customized to the right of the integration name.

   You can regenerate the WSDL for an individual endpoint or the WSDLs for all endpoints in an integration.

4. To regenerate the WSDL for a single endpoint in the integration, click the appropriate source, target, request enrichment, or response enrichment icon.

   a. Select Regenerate Artifact.

      You are prompted with a message indicating that WSDL regeneration impacts the mappings in the integration.

   b. Click Yes.

      This regenerates the WSDL and any dependent artifacts so that any custom elements appear during mapping. The imported mappings from any prebuilt integration are not deleted. The maps are validated and any warnings (identified by yellow icons) or errors (identified by red icons) for the impacted maps are displayed. If warnings and errors both exist for a single mapper, only a single error icon is displayed. Icons indicating that this mapper is customized (identified by the blue icons) are displayed at the bottom of the mapper.

5. To regenerate the WSDLs for all endpoints in the integration, select Actions at the top of the page.
a. Click **Regenerate endpoints**.

You are prompted with a message indicating that WSDL regeneration impacts the mappings in the integration.

b. Click **Yes**.

This regenerates the WSDLs and any dependent artifacts with the same behavior as described in Step 4.

For information on using the mapper, see Mapping Data of *Using the Oracle Mapper*.

### Creating Lookups

A lookup associates values used by one application for a specific field to the values used by other applications for the same field. This provides the capability to map values across vocabularies or systems. For example, you can map country codes, city codes, currency codes, and so on.

**Topics**

- Creating a Lookup
- Adding Adapters or Domain Names to a Lookup
- Cloning a Lookup
- Deleting a Lookup

### Creating a Lookup

Create a lookup to map values between applications.

1. From the Designer Portal, select **Lookups**.
2. Click **Create New Lookup**.

   The New Lookup — Information dialog is displayed.
3. Enter a name and optional description for the lookup.
4. Click **Create**.

   The Lookup page is displayed.
Adding Adapters or Domain Names to a Lookup

Add adapters or domain name to a lookup to map values between connections.

1. Click Domain Name 1.
   A menu with options is displayed.

2. Select the type to create:
   • **Select Adapter**: This selection invokes the Select Adapter dialog for choosing the adapter to use. You can change your selection:
     – If you want to change your adapter selection, click the selected adapter type, then choose Select Different Adapter.
     – If you want to change from an adapter to a domain name, click the selected adapter type and choose Replace with Domain Name.
   • **Enter Domain Name**: This selection invokes a dialog for entering the domain name to use. There is a 50 character limit. You can change your selection:
     – If you want to change from a domain name to an adapter, click the domain name, then choose Replace with Adapter.
     – If you want to change the domain name, click the name, then choose Edit Domain Name.
   The adapter or domain name is displayed.

3. Enter a value in the field below the adapter or domain name. To add more rows for additional values, click the + sign.

4. Click Domain Name 2.

5. Repeat Step 2 to add an adapter or domain name.

6. Enter a value in the field below the adapter or domain name. To add more rows for additional values, click the + sign.

7. If you want to add another column, click +.

8. Repeat to add more adapters and domain names to the lookup.

9. Click Save when complete.
Cloning a Lookup

You can clone a copy of an existing lookup. It is a quick way to create a new lookup with similar information. Lookups with adapters and domain names can be cloned.

1. On the Lookups page, click **Clone** from the Lookup menu.

   ![Clone Lookup dialog](image)

   The Clone Lookup dialog is displayed.

   2. Enter the lookup information.

   3. Click **Clone**.

   4. Click **Edit** to further configure your cloned connection.

Deleting a Lookup

You can delete a connection from the Lookup menu.

1. Click **Delete** from the Lookup menu.
The Delete connection dialog is displayed.

2. Click **Yes** to confirm deletion.

**Creating the lookupValue Function**

You can create the parameter values for the `lookupValue` function with the Build Lookup Function wizard. This wizard enables you to define the lookup table, source column, target column, and default value to use in the function. For these parameter values to be selectable in the wizard, you must have already created a lookup on the Lookups page.

**Topics**

- Accessing the Build Lookup Function Wizard
- Selecting the Lookup Table
- Selecting the Source and Target Columns
- Specify the Default Value
- Review Your Lookup Table Selections

**Accessing the Build Lookup Function Wizard**

The Build Lookup Function wizard for creating the `lookupValue` function parameter values is accessible from the Expression Builder in Oracle Integration Cloud Service.

To access the Build Lookup Function wizard:

---

**Note:** You must already have created lookups to use this wizard. For information about creating lookups, see [Creating Lookups](#).
1. Go to the Integrations page.
2. Open an integration.
3. Invoke the Expression Builder from within the integration. For example:
   - In an orchestrated integration, edit a switch activity.
   - In a basic integration, click the Filter link.
   The Expression Builder is displayed.
4. Expand the Components section.
5. Expand the Functions section.
   Expand the lookupValue function to view the available parameters to define in the Build Lookup Function wizard and Expression Builder.
   - dvmLocation
   - srcColumn
   - srcValue
   - targetColumn
   - defaultValue
6. Drag the lookupValue function into the New Condition field.
   The Build Lookup Function wizard is displayed. To create the lookupValue function parameter values, see section Selecting the Lookup Table.

Selecting the Lookup Table

Select the lookup table to use in the lookupValue function.

Topics

- What You Can Do from the Select Lookup Table Page
- What You See on the Select Lookup Table Page

What You Can Do from the Select Lookup Table Page
Select the lookup table to use in the function.

Note: You must already have created a lookup. Otherwise, no lookups are displayed for selection.

What You See on the Select Lookup Table Page
The following table describes the key information on the page.
Selecting the Source and Target Columns

Select the source and target columns to use in the `lookupValue` function.

Topics

- What You Can Do from the Source and Target Columns Page
- What You See on the Source and Target Columns Page

What You Can Do from the Source and Target Columns Page

Select the source and target columns to use in the `lookupValue` function.

The `lookupValue` function requires one source column and one target column.

What You See on the Source and Target Columns Page

The following table describes the key information on the page.

When you select a source and target column, the values available with the columns are displayed.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select Source Column</td>
<td>Click the source column header to select from a list of available columns for this lookup table. The data included with the selected column is displayed. Both adapter and domain name columns are displayed.</td>
</tr>
<tr>
<td>Select Target Column</td>
<td>Click the target column header to select from a list of available columns for this lookup table. The data included with the selected column is displayed. Both adapter and domain name columns are displayed.</td>
</tr>
</tbody>
</table>

Specify the Default Value

Select the default value to use in the `lookupValue` function.

Topics

- What You Can Do from the Default Value Page
- What You See on the Default Value Page
What You Can Do from the Default Value Page

Enter the default value to use if no match is found. If there is no match that satisfies all the search values, the lookup fails and the default value is returned.

What You See on the Default Value Page

The following table describes the key information on the page.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default Value</td>
<td>Enter a default value to use if no match is found (for example, an actual default value to use or an error message such as No Value Found).</td>
</tr>
</tbody>
</table>

Review Your Lookup Table Selections

You can review the lookup table values to use in the `lookupValue` function on the Summary page.

Topics

- What You Can Do from the Lookup Table Summary Page
- What You See on the Lookup Table Summary Page

What You Can Do from the Lookup Table Summary Page

You can review the lookup table values from the Summary page. The Summary page is the final wizard page after you have completed your configuration.

What You See on the Lookup Table Summary Page

The following table describes the key information on the page.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter and Value Table</td>
<td>Displays a summary of the parameters and values you defined on previous pages of the wizard.</td>
</tr>
<tr>
<td></td>
<td>To return to a previous page to update any values, click the appropriate tab in the left panel or click Back.</td>
</tr>
</tbody>
</table>
Element | Description
--- | ---
**Resulting Expression** | Displays the expression you defined on the previous pages of the wizard. The `lookupValue` function takes the following format:

```
lookupValue(dvmLocation, srcColumn, srcValue, targetColumn, defaultValue)
```

Where:
- **dvmLocation**: The lookup table selected on the Select Lookup Table page.
- **srcColumn**: The source column selected on the Select Columns page.
- **srcValue**: The source value you enter in the New Condition field of the Expression Builder after completing this wizard. Click **Done** to complete this wizard, then define the `srcValue` parameter value.
- **targetColumn**: The target column selected on the Select Columns page.
- **defaultValue**: The default value entered on the Default Value page.

For example, a defined `lookupValue` function after you have completed the wizard and defined the `srcValue` parameter value in the Expression Builder can look as follows:

```
dvm:lookupValue('tenant/resources/dvms/Country','rightnow','US','mysoap','No data found')
```

---

**Importing Map Files**

Review the following topics to learn how to import map files into Oracle JDeveloper and Integration Cloud Service.

**Topics**

- Importing a Map File into Oracle JDeveloper
- Importing a Map File into Integration Cloud Service

For information about exporting an integration that includes a map file that you want to edit in Oracle JDeveloper, see Exporting an Integration.

**Importing a Map File into Oracle JDeveloper**

You can import an Integration Cloud Service archive file into an Oracle Service Bus project in Oracle JDeveloper. The archive file can include a map file that is largely complete in content or a map file that is empty of content. This action enables you to perform advanced XSLT tasks (create variables, use templates, and so on) in Oracle JDeveloper that you cannot perform in the Integration Cloud Service mapper. After
you complete these advanced tasks in Oracle JDeveloper, you can save and re-import the map file into Integration Cloud Service.

1. See Exporting an Integration for instructions on exporting an integration that includes the map file you want to edit in Oracle JDeveloper.

2. Create an Oracle Service Bus application with a project in Oracle JDeveloper.

3. In the application navigator, right-click the Oracle Service Bus project and select Import.

   The Import dialog is displayed.

4. Select Service Bus Resources, and click OK.

   The Import Service Bus Resources wizard is displayed.

5. Select Zipped/Archived Resources, and click Next.

6. Click the Browse Zip Source icon to the right of the Zip Source field.

   The Select ZIP File dialog is displayed.

7. If using Oracle JDeveloper 12.2.1, perform the following steps:
   a. From the File Type menu, select ICS Archive (*.iar).
   b. Browse for and select the Integration Cloud Service IAR archive file that you previously exported.

8. If using Oracle JDeveloper 12.1.3, perform the following steps:
   a. Ensure that you first rename the .iar file extension to .zip.
b. Browse for and select the ZIP file to import.

9. Click OK, then click Next on the wizard page.

The contents of the JAR file are displayed and can be selected for import.

10. Select the resources folder in which to import the archive file. Note that the entire Resource tree is selected by default, including everything above the hierarchy node that you want to select. Ensure that you deselect the parts above the relevant hierarchy node, then click Finish.

The resources are imported into the Oracle Service Bus project. You can now open the map file for editing with the XSLT Map Editor in Oracle JDeveloper.

**Importing a Map File into Integration Cloud Service**

There may be scenarios in which you need to perform an advanced XSLT task (create variables, use templates, and so on) that you cannot perform in the Integration Cloud Service mapper. For these cases, you can export the integration, import the integration into Oracle JDeveloper, perform these advanced tasks in the map file in the XSLT Map Editor in Oracle JDeveloper, and then save and re-import the map file into Integration Cloud Service. The map file must be from an Oracle Service Project in Oracle JDeveloper.

**Note:** You cannot edit a map file imported into the Integration Cloud Service mapper.

1. Click the Designer icon in the upper right corner, then click Integrations.
2. Click the specific integration in which to import the map file.
3. Click the mapper icon to display a menu.

4. Click **Import**.

5. Click **Browse** to select the map (.xsl) file. Note that while you exported the entire integration, you do not import the entire integration back into Integration Cloud Service. You only import the map file of the exported integration back into Integration Cloud Service.

**Importing and Exporting Components**

You can import and export both integrations and lookups to share them between Integration Cloud Service environments.

See the following topics:

- Exporting an Integration
- Importing an Integration
- Exporting a Lookup
- Importing a Lookup

**Exporting an Integration**

Once you create an integration, you can export that integration as a JAR file for use in other Integration Cloud Service environments or import the integration into Oracle JDeveloper to perform an advanced XSLT mapper task (for example, creating variables or using templates) that you cannot perform in the Integration Cloud Service mapper. After mapper editing in Oracle JDeveloper is complete, the mapper file can then be imported back into Integration Cloud Service. You can export an integration from either the Integration Designer or from the Integrations list.

To export an integration:
1. On the toolbar, click Designer.


3. Do one of the following:
   - Select the integration in the Integration Designer, click Actions, and then select Export.
   - Locate the integration to export in the Integrations list on the left side of the page. Click the vertical lines icon to the right in the integration’s row, and then select Export.

4. In the dialog that appears, select Save File, and then click OK.

5. Save the file to the location you want.

The file is saved with a name that consists of the identifier plus the version number, and an IAR extension.

For information about importing an exported integration into the XSL Map Editor in Oracle Service Bus, see Importing a Map File into Oracle JDeveloper.

---

**Note:** Lookups referenced using the `lookupValue` function in the Expression Builder are included in the exported integration JAR file. When you import the integration, the referenced lookups are also imported and are visible in the Expression Builder. For information about referencing lookups, see Referencing Lookups.

---

**Importing an Integration**

You can import integrations that were previously exported as a JAR file from Integration Cloud Service.

To import an integration:

1. On the toolbar, click Designer.


3. In the banner, click Import.

4. In the Import Integration File dialog, click Browse to navigate to and select the file to import.
5. Click **Import**.

If an integration already exists with the same identifier and version, you must confirm whether to overwrite the existing integration.

The imported integration appears in the Integrations list and you can customize or activate it.

---

**Note:** Even though the **Activate** button is enabled after you import an integration, you must first configure your connection endpoints. If you do not, you receive an error when trying to activate the integration. For information about editing connections, see Editing a Connection and Adapter Configuration Reference.

---

### Exporting a Lookup

Once you create a lookup, you can export that lookup for use in other Integration Cloud Service environments. You can export a lookup from either the Lookup Designer or from the Lookups list.

To export a lookup:

1. On the toolbar, click **Designer**.
2. On the Designer Portal, click **Lookups**.
3. Do one of the following:
   - Locate the lookup to export in the Lookups list on the left side of the page. Click the vertical lines icon to the right in the lookup’s row, and select **Edit**. In the upper right corner, click **Actions**, and select **Export**.
   - Locate the lookup to export in the Lookups list on the left side of the page. Click the vertical lines icon to the right in the lookup’s row, and select **Export to CVS**.
4. In the dialog that appears, select **Save File**, and then click **OK**.
5. Save the file to the location you want.

The file is saved as a CSV file with the same name as the lookup.

### Importing a Lookup

You can import lookups that were previously exported from Integration Cloud Service.

The file to import must have the following for the first row, where `table_name` is the name of the table as you want it to appear in Integration Cloud Service. This name cannot contain spaces.

```
DVM,table_name
```

The second row contains the names of the adapters that are being mapped. Use the following case-sensitive IDs for each adapter:
<table>
<thead>
<tr>
<th>Adapter Name</th>
<th>Identifier to Use in the Import File</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle Eloqua Cloud</td>
<td>eloqua</td>
</tr>
<tr>
<td>Oracle Sales Cloud</td>
<td>osc</td>
</tr>
<tr>
<td>Oracle Messaging Cloud Service</td>
<td>oms</td>
</tr>
<tr>
<td>Oracle RightNow Cloud</td>
<td>rightnow</td>
</tr>
<tr>
<td>Oracle HCM Cloud</td>
<td>hcm</td>
</tr>
<tr>
<td>Oracle ERP Cloud</td>
<td>erp</td>
</tr>
<tr>
<td>Salesforce Cloud</td>
<td>salesforce</td>
</tr>
</tbody>
</table>

To import a lookup:

1. Locate the CSV file containing the lookup table you want to import.
2. On the toolbar, click Designer.
4. In the banner, click Import.
5. In the Import Lookup File dialog, click Browse to navigate to and select the CSV file to import.
6. Click Import.

   If a lookup already exists with the same identifier and version, you must confirm whether to overwrite the existing lookup.

The imported lookup appears in the Lookups list on the left. You can customize or activate it, if it is ready.

### Assigning Business Identifiers for Tracking Fields in Messages

This section describes how to manage business identifiers that enable you to track fields in messages during runtime.

**Topics**

- Assigning Business Identifiers
- Deleting Business Identifiers

### Assigning Business Identifiers

Business identifiers enable you to track payload fields in messages during runtime. You can specify up to three business identifier fields for tracking during design time. One of these fields must be selected as the primary business identifier field. The primary business identifier enables you to track fields across integration flows during runtime, and is always available. At runtime, the status of business identifiers is visible on the Tracking page and (if integration errors have occurred) the Errors page.

To assign business identifiers:
1. Click the **Designer** icon.

2. Click **Integrations**.

   The Integrations page is displayed.

3. Click the specific integration to which to add business identifiers. You can only add business identifiers to integrations that are *not* active. If an integration is active, you can only view its existing business identifiers.

4. In the upper right corner, click **Tracking**.

   The Business Identifiers For Tracking dialog is displayed. The source payload for the selected integration is displayed on the left side. You can only assign business identifiers to fields of source payloads. You cannot assign business identifiers to fields of target payloads.

5. From the **Available Source Fields** section, drag the payload field that you want to track to the **Drag a source field here** section.

   ![Business Identifiers For Tracking dialog](image)

   You can filter the display of source structures by clicking the **Filter** link. This enables you to filter on whether or not fields are used and on the type of field (required fields, custom fields, or all fields).

6. Select the checkbox if you want to make this the primary business identifier. At least one identifier is required.

7. In the **Tracking Name** field, optionally enter a descriptive name to track during runtime (for example, `OrgId`). The name is displayed when this field is used to filter messages on the Tracking page or (if there is an integration error) the Errors page during runtime.

8. In the **Help Text** field, optionally enter instructions to enable users to know what to enter in this field during runtime (for example, `Enter a valid organization number`). These instructions are displayed inside the empty field when it is used on the runtime Tracking page to filter messages.

9. Click **Done**.

### Deleting Business Identifiers

You can delete business identifiers that track fields in messages during runtime.

To delete business identifiers:

1. Click the **Designer** icon.

2. Click **Integrations**.

   The Integrations page is displayed.
3. Click the specific integration to which to add a business identifier. You can only add business identifiers to integrations that are not active. If an integration is active, you can view, but not edit, the contents of the Business Identifiers for Tracking dialog.

4. In the upper right corner, click Tracking.

5. Click Tracking in the menu that is displayed.

The Business Identifiers for Tracking dialog is displayed.

6. At the far right, click the Delete icon for the business identifier to delete. If you delete the primary business identifier, select a new one. Without a primary identifier, you cannot track fields across integration flows during runtime on the Tracking page.

Managing Packages

You can group integrations into a package. When you import or export the package to or from Integration Cloud Service, all integrations in that package are imported or exported.

Topics

• Viewing the Integrations in a Package
• Importing a Package
• Exporting a Package
• Updating a Package
• Deleting a Package

When you create an integration, you can also create a package or select an existing package in which to include the integration. For more information, see Creating an Integration. For conceptual information about packages, see About Integration Cloud Service Packages.

Viewing the Integrations in a Package

You can view the integrations included in a package.

1. In the Integration Cloud Service toolbar, click Designer.

2. Click Packages.

The Packages page is displayed. The package names and the number of integrations included in each package are displayed. You can filter the display of packages by entering the full or partial name (using a wildcard value of *) and clicking the Search icon. If you have not yet created or imported a package into Integration Cloud Service, this page is empty.
3. Click the name of the package or select View Integrations from the menu at the far right.

The integrations included in that package and their current states are displayed (for example, pending activation or active).

4. In the navigator pane, click Integrations to access the Integrations page for viewing these integrations.

**Importing a Package**

You can import a package of integrations into Integration Cloud Service from the Packages page. The Packages page enables you to import packages that you or other users have created. To import packages that consist of integrations that are prebuilt by Oracle, you must go to Oracle Marketplace.

1. In the Integration Cloud Service toolbar, click Designer.
2. Click Packages.
3. In the banner, click Import.
4. Browse for and select the packages archive (PAR) file when prompted.
5. Click **Import**.

   The package is added to the list on the Packages page.

For information about importing prebuilt packages from Oracle Marketplace, see Importing a Prebuilt Integration.

### Exporting a Package

You can export a package of integrations from Integration Cloud Service on the Packages page. This action exports all the integrations included in that package.

1. In the Integration Cloud Service toolbar, click **Designer**.

2. Click **Packages**.

   The Packages page is displayed.

3. From the menu at the far right, select **Export**.

4. Save the package (PAR) file of integrations to a file system location when prompted. The individual integrations inside the PAR file are exported as integration archive (IAR) files.

### Updating a Package

You can update the package in which your integration is included. For example, you can create a new package for your integration or move your integration to an existing package.

1. On the Integrations page, click the integration of the package that you want to update. The integration must not be active.

2. Click the **Edit** icon.

   The Update Integration dialog is displayed.

3. In the **Package Name** field, enter a new package name or enter an existing package name (as you type the initial letters, the existing package is displayed) to move your integration to an existing package.

4. Click **OK**.

5. Click **Save**, then click **Exit Integration**.

6. In the navigation pane, click **Packages**.

7. Click the package name you specified in the Update Integration dialog to see your integration.
Deleting a Package

You can delete a package. This action deletes the package and all integrations included in that package.

1. In the Integration Cloud Service toolbar, click Designer.
2. Click Packages. The Packages page is displayed.
3. From the menu at the far right, select Delete.
4. Click Yes when prompted to confirm your selection. The package and all of its integrations are deleted.

Managing Agent Groups and the On-Premises Agent

You must create an agent group and install the on-premises agent before you can create an integration in which messages are exchanges between your on-premises applications and Oracle Integration Cloud Service.

Topic

- Creating an Agent Group
- Downloading and Running the On-Premises Agent Installer
- Creating a Connection with an Agent Group
- Viewing and Editing Agent Groups
- Deleting an Agent Group
- Updating Property Values
- Upgrading the On-Premises Agent to Release 16.4.5

Creating an Agent Group

You must create an agent group in Oracle Integration Cloud Service before you can run the agent installer. When you install the on-premises agent in your environment, you associate the on-premises agent with the agent group identifier. Only one on-premises agent can be associated with an agent group. For a single Oracle Integration Cloud Service instance, you can create up to five agent groups.

To create an agent group:

1. In the Integration Cloud Service toolbar, click Designer.
3. Click New Agent Group.
   The New Agent Group — Information dialog is displayed.
4. Enter the following information:
### Field | Description
---|---
**Agent Group Name** | Provide a meaningful name so that others can understand the agent name. The name must be unique among all agent names in the system. The name can consist of the following:
- Letters (A-Z, a-z)
- Numbers (0-9)
- Spaces ( )
- Special characters ( _ - )
The name must not begin or end with a space and cannot be longer than 50 characters.

**Identifier** | Accept the default identifier value or change it, if necessary. The identifier is initially the same as the agent group name you provided, but in upper case. When you install the on-premises agent, you must specify the identifier value. For more information, see Downloading and Running the On-Premises Agent Installer.

**Agent Type** | Connectivity Agent is displayed and cannot be edited. The connectivity agent supports integrating with on-premises systems. The agent group references only connectivity agents.

**Description** | Provide a meaningful description so that others can understand the responsibilities of the agent group.

### Downloading and Running the On-Premises Agent Installer
You must download the agent installer from Oracle Integration Cloud Service and run the installer to install the on-premises agent in your local environment. During installation, you associate the agent with the agent group identifier you generated when creating an agent group in Oracle Integration Cloud Service.

For information about upgrading the on-premises agent to the latest release, see Upgrading the On-Premises Agent to Release 16.4.5.

- System Requirements and Restrictions
- Installing the On-Premises Agent
- Troubleshooting Issues
- Deinstalling the On-Premises Agent

### System Requirements and Restrictions
You must satisfy the following prerequisites on your on-premises host before running the agent installer in a production environment:

- If you are using a proxy server, note that proxy server authentication support is *not* provided. As a workaround, disable proxy authentication in your proxy server settings for the agent.
• Ensure that you have created the agent group. You must specify the agent group identifier when installing the on-premises agent. For information, see Creating an Agent Group.

• Install only Oracle JDK version 1.7 or 1.8. Other JDKs such as Open JDK are not supported.

• Set the JAVA_HOME property to the location of the JDK installation. For example:

```
JAVA_HOME=/usr/java/jdk1.7.0_79
```

• Install the on-premises agent on Linux OEL version 5 or 6 only.

• Provide a minimum of 8 GB memory with 4 GB of heap size dedicated for the agent JVM. If you want to include any other processes on that host besides the on-premises agent, it is strongly recommended that you increase physical memory to greater than 8 GB.

• Ensure that a Derby database is not running. See the Troubleshooting section below for details.

**Installing the On-Premises Agent**

To download and run the on-premises agent installer:

---

**Note:** It is recommended that you retain a copy of the cloud-connectivity-agent-installer.bsx agent installer file after completing installation.

---

1. Log in to Oracle Integration Cloud Service.

2. In the Integration Cloud Service toolbar, click **Designer**.

3. On the Designer Portal, click **Agents**.

   The Agent Groups page is displayed. This page shows any current agent groups and on-premises agents associated with the agent groups.

4. Click **Download**.

5. Select **Connectivity Agent**.

   This selection enables you to integrate Oracle Integration Cloud Service with on-premises environments.

6. Select **Save File** when prompted to save the file to a directory location on your on-premises host.

7. Unzip the downloaded file.


9. Change the file permissions to be executable.

   ```
   chmod +x cloud-connectivity-agent-installer.bsx
   ```

10. Execute the file with the following properties.
Note: Ensure that you understand the following issues:

- Do not forget the agent username (-au) and agent password (-ap) if you specify them during installation. The same values are required when upgrading the on-premises agent to newer versions. If you forget the supplied parameters, a re-installation of the on-premises agent may be required because upgrading the on-premises agent is not possible. However, if these parameters are not supplied during installation, the default username is `weblogic`. Contact Oracle Support Services to obtain the default password for `weblogic`.

- Do not install the on-premises agent in a directory path that includes `/tmp`.

- Note the use of the dash (\-) when specifying the property value.

- The output of this command is displayed on-screen. For troubleshooting purposes, the installation logs are generated and available at same location as the BSX file. You can also redirect the output to an output file.

```
./cloud-connectivity-agent-installer.bsx -h=https://ICS_host.us.oracle.com:port -u=username -p=my_password -ad=agent_group_identifier -au=agent_username -ap=agent_password
```

where:
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Status</th>
<th>Description</th>
<th>Additional Notes</th>
</tr>
</thead>
</table>
| -h        | Required | Specify the Oracle Integration Cloud Service hostname and port. As an example, when installing from your Oracle Integration Cloud Service POD, the host and port you specify are typically the Oracle Integration Cloud Service URL (for example, `https://icsapps.integ.dc4.c1234.oraclecorp.com:443`). | Note the following issues:  
  - Do not specify `/ics` after the port number.  
  - If you forget to specify a port, you receive the following error:  
    ```  
    NumberFormatException  
    ```  
  - If you specify port 80 with the `https` protocol, you can receive the following error:  
    ```  
    Outbound ProxyHost and ProxyPort as not provided  
    ```  |
<p>| -u        | Required | Specify the Oracle Integration Cloud Service user name. |  |</p>
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Status</th>
<th>Description</th>
<th>Additional Notes</th>
</tr>
</thead>
</table>
| -p        | Required | Specify the Oracle Integration Cloud Service password. | Note:  
- Some special characters must be properly escaped with a backslash (\) character. For example, if your password includes an exclamation character, you must enter the backslash character before the exclamation character (\!).  
- If the password contains a dollar sign ($) character (for example, \$lcome11), the complete password value must be contained in single quotes (for example, `-p='\$lcome11'`). Otherwise, you receive an Undefined variable error when you run the agent installer command. |
<p>| -ad       | Required | Specify the agent group identifier that was generated in the Identifier field when you created the agent group in the New Agent Group - Information dialog in Creating an Agent Group. You must create the agent group before you can install the on-premises agent. |  |
| -au       | Optional | Specify a new agent username. This is a new username used to initialize the local installation of the on-premises agent. If not specified, the default username of weblogic is used. |  |
| -ap       | Optional | Specify a password for the new agent username. If not specified, the default password is used. You may need to contact Oracle Support Services to obtain the default password for the default user weblogic. |  |</p>
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Status</th>
<th>Description</th>
<th>Additional Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>-aport</td>
<td>Optional</td>
<td>Specify the agent port (for example, 9002). This enables you to specify any available port outside of the default value of 7001. If not specified, it defaults to 7001. Any free port can be used.</td>
<td>If your on-premises host includes a proxy server, you must specify this property. The agent can work with any proxy in the DMZ.</td>
</tr>
<tr>
<td>-ph</td>
<td>Optional</td>
<td>Specify the hostname, or address, of the proxy server. A proxy server allows indirect connection to network services and is used mainly for security (to get through firewalls) and performance reasons (proxies often provide caching mechanisms). The -ph and -pp properties are only required if your on-premises environment is set up with a proxy server mandating that all connections be routed through it.</td>
<td></td>
</tr>
<tr>
<td>-pp</td>
<td>Optional</td>
<td>Specify the port number of the proxy server.</td>
<td>If your on-premises host includes a proxy server, you must specify this parameter.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Status</td>
<td>Description</td>
<td>Additional Notes</td>
</tr>
<tr>
<td>-----------</td>
<td>---------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>profile</td>
<td>Optional</td>
<td>Set the number of worker threads to a value appropriate to your environment.</td>
<td></td>
</tr>
</tbody>
</table>
|           |         | • PROD: When `-profile PROD` is specified, the `agentWorkerThreads` property value is set to 40 in the `CpiAgent.properties` file. This setting is optimal for high-load environments. When `-profile -PROD` is not specified, the `agentWorkerThreads` property value also defaults to 40.  
• DEMO: When `-profile DEMO` is specified, the `agentWorkerThreads` property is set to 3.                                                                                       | A value of 3 may be sufficient for some low-load environments and most demo environments. However, for high-load environments, the agent instance may need additional tuning. Increase concurrency on the on-premises agent host by specifying the `-profile PROD` property during installation. This automatically sets the number of worker threads to 40 (the recommended value for high-load environments).  
You can also specify this value in the `CpiAgent.properties` file after installation. This change requires an agent restart.  
`agentWorkerThreads=40`  
For information about editing this file, see Updating Property Values.                                                                                                                                                                      |

During installation, the following tasks are performed:

- All on-premises adapters are registered.
- A Java database is installed.
- The JRF domain is created.
- The on-premises agent is deployed.

Once installation is complete, an agent instance is created for interacting with Oracle Integration Cloud Service. You can verify that the agent instance was created by going to the Agent Groups page and noting that the agent count was increased by one. If you click the number, details about the agent are displayed. For more information, see Viewing and Editing Agent Groups.

You are now ready to create an adapter connection in Oracle Integration Cloud Service that uses the on-premises agent. See Creating a Connection with an Agent Group.

**Note:** Do not use `startWeblogic.sh` and `stopWeblogic.sh` to start and stop the on-premises agent. Instead, use `startAgent.sh` and `stopAgent.sh`, as described in this section.
Troubleshooting Issues

• If there is a Derby database (DB) already in use on the host on which the agent is being installed, you receive the following error:

    com.oracle.cie.domain.jdbc.DatasourceXBeanAspectHelper -
    prop str:
    user=dummy;portNumber=1527;databaseName=dummy;create=true;servername=localhost
    url: jdbc:derby://localhost:1527/dummy;ServerName=localhost;databaseName=dummy
    com.oracle.cie.domain.jdbc.DatasourceXBeanAspectHelper -
    Selected DB ID/CAT: DerbyDerby's Driver (Type 4) Versions:Any 2016-01-27
    20:48:51,714 FINE
    [47] com.oracle.cie.domain.jdbc.DatasourceXBeanAspectHelper - Selected DB vendor:
    Derby
    20:48:51,714 FINE
    [47] com.oracle.cie.domain.jdbc.DatasourceXBeanAspectHelper - datasource: opss-data-
    source component
    name: OPSS Schema

Perform the following steps:

1. Check if the Derby database is running.
   ps -ef | grep "derby"

2. If any processes are displayed, run the following command to terminate them:
   ps -ef | grep "derby" | awk '{print $2} ' | xargs kill -9

Deinstalling the On-Premises Agent

If you need to reinstall the on-premises agent, you must first deinstall it. Follow these instructions in the order specified.

1. Stop the on-premises agent:
   ./stopAgent.sh

2. Delete the directory in which the on-premises agent is installed.

3. Go to Oracle Integration Cloud Service.


5. Find the agent group.

6. Click the number representing the agent count. The Agents in this Agent Group dialog is displayed.

7. Find the agent to delete, and click X to delete the agent registration.

8. Reinstall the on-premises agent with the agent group specified in the installation parameters, as described in Installing the On-Premises Agent.
Creating a Connection with an Agent Group

After you have installed the on-premises agent, you can create a connection that uses the agent group and its associated on-premises agent. Only agent groups whose monitoring status is green on the Agent Monitoring page and which have not yet been associated with an adapter can be selected.

To create a connection with an agent group:

1. In the Integration Cloud Service toolbar, click Designer.
2. On the Designer Portal, click Connections.
3. Click New Connection.
   For specific details about connection creation, see Creating Connections.
4. Select the adapter to configure as a target endpoint. For information about supported adapters, see About Agents and Integrations Between On-Premises Applications and Oracle Integration Cloud Service.
5. Configure the connection properties and security.
6. In the Agent Group section, click Configure Agents to select the agent group to associate with the adapter. This enables you to access your on-premises applications.
7. Select the agent group to use with this adapter, and click Use.
8. Click Test. This test executes the ping command on the on-premises instance when the connection is associated with an agent.
9. Click Save, then click Exit Connection.
10. Create an integration in which you drag the adapter to the target side for configuration. Only the target side is supported. For this example, an Oracle Siebel adapter is configured as the target connection in the integration.
11. Activate the integration, as described in Activating an Integration.
12. Invoke the integration.
**Note:** If you receive the following error, a connection time out has occurred. The request may be slow, in which case the request must be executed again. You can also view the agent logs to see what may be causing the request to not be processed.

CASDK-0005 A connector specific exception was raised by the application. oracle.cloud.cpi.omcs.api.CpiOmcsException. No response received within response time out window of 60000.

---

**Viewing and Editing Agent Groups**

You can view details about agent groups and their associated on-premises agents and edit the agent group name.

To view agent group details.

1. In the Integration Cloud Service toolbar, click **Designer**.
2. On the Designer Portal, click **Agents**.
3. Click the number above the **Agents** label to show the associated on-premises agent.
4. Click **Done** when complete.
5. If you want to edit the agent group name, click the menu icon at the far right.
6. Select **Edit**.
7. Update the name, then click **OK**. Changing the agent group name does not impact the association with the on-premises agent.

**Deleting an Agent Group**

You can delete an agent group that is not currently associated with a running on-premises agent instance. Deleting an agent group removes the Oracle Messaging Cloud Service queues and topics.

To delete an agent group:

**Note:** Before deleting an agent group, ensure that you stop the agent on the on-premises host with either of the following commands:

- Stop the on-premises agent:
  
  `./stopAgent.sh`

- Kill the running agent at the operating system command prompt:

  `kill -e agent_PID_number`

1. In the Integration Cloud Service toolbar, click **Designer**.
2. On the Designer Portal, click **Agents**.
3. Find the agent group to delete.
4. From the menu icon at the far right, select **Delete**.

5. Select **Yes** when prompted to confirm.

### Updating Property Values

If you need to change values for properties, edit the `CpiAgent.properties` file on your on-premises host.

To update property values:

1. Stop the on-premises agent by executing the following command in the `AGENT_INSTALL_DIR` directory.
   ```bash
   ./stopAgent.sh
   ```

2. Open the `agent-domain/agent/config/CpiAgent.properties` file.

3. Change property values, as necessary.

4. Save your changes and exit the file.

5. Restart the on-premises agent.
   ```bash
   ./startAgent.sh -u=Integration_Cloud_Service_Username -
   p=Integration_Cloud_Service_Password
   ```

**Note:** If the value of the username or password is provided in double quotes (for example, `-u="my_username"` or `-p="my_password"`) and the username or password contains special characters, the characters must be proceeded with a backslash (`\`). For example:

   ```bash
   ./startAgent.sh -u="ICS_USER" -p="ICS_PAs\$"
   ``

   However, if the value of the username or password is provided in single quotes, no change is needed. For example:

   ```bash
   ./startAgent.sh -u='ICS_USER' -p='ICS_PAs$'
   ```

To troubleshoot errors, you can also redirect the output of `startAgent.sh` to a file. For example, ```bash
./startAgent.sh >& wls.out
```  

### Upgrading the On-Premises Agent to Release 16.4.5

If you previously installed the on-premises agent on your local host, you must upgrade to release 16.4.5 to communicate with Oracle Integration Cloud Service 16.4.5.

To upgrade the on–premises agent to release 16.4.5:
Note:

- For the on-premises agent upgrade to work, you must set the `JAVA_HOME` parameter. Only Oracle JDK version 1.7 and 1.8 are supported. Any other JDK such as Open JDK does not work. If not set, on-premises agent upgrade fails. For information on setting this parameter, see Downloading and Running the On-Premises Agent Installer.

- You can run the following command to obtain online help for upgrading the on-premises agent. This file is available in step 1g below.

```
./cloud-connectivity-agent-patcher.sh -help
```

1. Download the patch ZIP file and perform the following steps.
   a. In the Integration Cloud Service toolbar, click Designer.
   c. Click Download Agent Installer to download the 16.4.5 ZIP file.
   d. Select Connectivity Agent. This initiates the patch ZIP file download.
   e. Save the ZIP file to the file system.
   f. Unzip the ZIP file and note the following files.
      - cloud-connectivity-agent-installer.bsx
      - cloud-connectivity-agent-patcher.zip
   g. Extract the `cloud-connectivity-agent-patcher.zip` and notice the following files.
      - cloud-connectivity-agent-ics.properties
      - cloud-connectivity-agent-patcher.jar
      - cloud-connectivity-agent-patcher.sh
      - cloud-connectivity-agent-patching-scripts.zip
   h. Run `cloud-connectivity-agent-patcher.sh`.

Note:

- Ensure that you specify `-` (shorter hyphen) in front of each parameter and not `--` (longer hyphen). For example, `-au` and not `--au`.

- While supplying the `--patchZipFile`, ensure that you supply the file with pattern `ics_conn_agent_installer_XXXXXX.YYYY.zip`. This is the actual zip file of the connectivity agent installer downloaded from Oracle Integration Cloud Service.
During upgrade, use the `-patchZipFile` parameter to specify the complete path of the patch zip file that includes the BSX file.

```
./cloud-connectivity-agent-patcher.sh -agentInstallDir=AGENT_INSTALL_DIR -icsUn=ICS_username -icsPwd=ICS_password -patchZipFile=file_name.zip
```

Where:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>-agentInstallDir</code></td>
<td>Mandatory</td>
<td>The installation directory of the existing agent (AGENT_INSTALL_DIR under which agenthome should be present).</td>
</tr>
<tr>
<td><code>-icsUn</code></td>
<td>Mandatory</td>
<td>The Oracle Integration Cloud Service username for running the upgrade (for example, weblogic).</td>
</tr>
<tr>
<td><code>-icsPwd</code></td>
<td>Mandatory</td>
<td>The password of the Oracle Integration Cloud Service username for running the upgrade.</td>
</tr>
<tr>
<td><code>-patchZipFile</code></td>
<td>Optional</td>
<td>The complete path of the already downloaded patch ZIP file in which the BSX file is available. If you do not specify this parameter, the ZIP file is automatically downloaded from Oracle Integration Cloud Service.</td>
</tr>
</tbody>
</table>

2. For example, in the following command, the `/scratch/myuser/agents/agent1` directory includes the agenthome directory and the `/scratch/myname/agents/patch/` directory includes the ZIP file that contains the `cloud-connectivity-agent-installer.bsx` file.

```
```

For this example, the patch ZIP file was manually downloaded from Oracle Integration Cloud Service. Therefore, it is good to use that same patch file. If the `-patchZipFile` parameter is not specified, the application connects to Oracle Integration Cloud Service, downloads the same patch ZIP file, and proceeds with patching.

The patching process begins. The security certificate is downloaded if not already available and added to the keystore. If you go to the Agent Groups page in Oracle Integration Cloud Service during the upgrade process and expand the agent group name, various messages are displayed, including Upgrade in Progress, Restart Pending, and Up to Date. The on-premises agent is automatically restarted after the patch is applied. Once the patch ZIP file is available for extraction (either through the `-patchZipFile` parameter or through download from Oracle Integration Cloud Service), the remaining process takes around 10 to 15 minutes to complete. This time period includes restarting the on-premise agent.
3. Verify that upgrade is complete by looking under the agenthome directory. You see that the soa, osb, and lib directories are upgraded and backups of these directories have occurred. The backups are identified by a _BAK_PRE_NEW-VERSION suffix in the agenthome directory.

Scheduling Integration Runs

You can schedule the running of integrations. For example, you can create an orchestrated integration that is triggered by a schedule or create a basic map data integration in which a trigger FTP Adapter reads a file and an invoke FTP Adapter writes the file. You can schedule this integration run to copy files at a date and time of your choosing. You can also define the frequency of the integration. When you create either of these types of integrations, a schedule icon is displayed with the integration entry on the Integrations page.

Topics

- Creating an Integration Schedule
- Starting and Pausing an Integration Schedule
- Viewing Past and Present Integration Runs
- Viewing Future Runs
- Editing an Integration Schedule
- Deleting an Integration Schedule
- Monitoring Integration Runs
- Creating Ad-Hoc Integration Runs Using the REST API

For more information about the FTP Adapter see Getting Started with the FTP Adapter.

Creating an Integration Schedule

You can create a schedule for running orchestrated integrations.

To create an integration schedule:

1. Go to the Integration page.

2. Find the integration in which trigger and invoke FTP adapter connections have been defined.

   These integrations are identified by a Schedule icon that depicts a calendar. There are several ways in which to create an integration.

3. If you want to first activate the integration and then create the schedule:
   a. Click the Activate icon.
   b. Click Activate and Schedule.

4. If you want to first create a schedule for an integration that you activate later:
   a. Select Add Schedule from the dropdown menu at the far right.
5. In the **Schedule Name** field, accept the default name or click the **Edit** icon to enter a new name. When complete, enter an optional description and click the **green checkmark**. This action does not save the changes.

**Note:** Assume you create a schedule and generate several integration runs, then deactivate and delete the integration. If you then create and activate a new integration with the same name as the deleted integration, and go to the Past Runs page, the past runs of the deleted integration are displayed. This is by design.

6. If you want to schedule integration runs with an iCal expression, click **Advanced**.

   a. Enter an iCal expression, and click **Validate Expression**. For example, the following expression indicates that this integration runs each month on the 1st, 10th, and 15th days of the month at 5:15 AM, 10:15 AM, 3:15 PM, and 8:15 PM.

   ![Basic Advanced](image)

   ```
   FREQ=MONTHLY;WKST=MONDAY;BYDAY=1,10,15;BYHOUR=5,10,15,20;BYMINUTE=15,
   ```

   If validation is successful, the following message is displayed at the top:

   **iCal expression is valid.**

   **Note:** There is a three minute limitation on how frequently you can run scheduled integrations with an iCal expression. Anything below this limit is not supported.

7. In the **Frequency** section, click the icon to display a dropdown list for selecting the frequency with which to run the integration. As you define one frequency, you can specify additional values by clicking the icon to the right of the **Frequency** section.

   - **Only Once**: This is the default selection. This selection clears all settings except for the **From** field.
     
     If you select this option, you cannot select **When schedule starts** as the start date. This option is disabled.

   - **Hours and Minutes**: Specify the hours and minutes at which to run the integration.

   - **Days**: Specify the days on which to run the integration.

   - **Weeks**: Specify the weeks during which to run the integration.

   - **Months**: Specify the months during which to run the integration.

8. Click the **green checkmark** icon for each frequency type that you specify.

9. Click **Save** to validate your frequency settings.

   Your selections are validated. If there are any errors, a validation message is displayed in the upper left corner that describes how to resolve the errors.
10. In the **This schedule is effective** section, click the link to the right of **From**.
   
   A menu is displayed for defining the start date of the schedule.

11. If you want to start the integration run when the schedule is activated:
   
   a. Click **When schedule starts**.

12. If you want to explicitly set an integration run start date:
   
   a. Select **Modify start date**.
   
   b. Click the **Calendar** icon to select the month, year, and day and the hour, minute, and second at which to start the integration run.
   
   c. Click **OK**.

13. In the **Until** section, click the link to the right.
   
   A menu is displayed for defining the expiration date.

14. If you want the schedule run to never expire:
   
   a. Select **Never (repeat indefinitely)**.

15. If you want the integration run to have a fixed expiration date:
   
   a. Select **Choose expiry date**.
   
   b. Click the **Calendar** icon to select the month, year, and day and the hour, minute, and second at which to end the integration run.
   
   c. Click **OK**.

16. Click **Save**.
   
   If successful, a message is displayed in the upper left corner.

   *Schedule Run name saved successfully*

17. Click **Exit Scheduler**.
   
   The Schedule and Future Runs page is displayed and the Monitoring tab is highlighted in the upper right corner.

   Details about the integration run schedule are displayed. You can click the **Edit** icon to update the schedule definition.

18. If you have already activated the integration, click **Submit Now** to run the integration or **Start Schedule** to activate the integration schedule.
Note:

- If you place a file in an input directory and run an integration for the first time, the file is copied to the output directory. If you then run the integration a second time, the same file is not copied again to the output directory, even if you deleted the file from the output directory before rerunning the integration. This is by design. Second integration runs do not copy the same file. However, if a new file is placed in the input folder or the previously-copied file is updated with a newer version in the input directory, both are copied to the output directory.

- If you create a new schedule to repeat every minute and launch the calendar to specify a start time, it shows the current time (for example, 12:41:16). If you update the start time to several minutes later (for example, 12:43:55), save, and start the scheduled integration run, the integration starts running at 12:43:16 instead of 12:43:55. The scheduler does not care about the seconds entered and runs the schedule every minute.

19. If you have not yet started the integration, return to the Integrations page and click Activate.

20. Run the schedule in either of two ways:
   
   a. From the menu at the far right on the Integrations page, select Submit Now.
   or
   
   a. Select Schedule from the dropdown menu at the far right to return to the Schedule and Future Runs page.

   b. Click Submit Now to run the integration or Start Schedule to activate the integration schedule.

Starting and Pausing an Integration Schedule

After you define a schedule, you must activate it. You can also pause (deactivate) a schedule, as needed.

To start and pause an integration schedule:

1. Go to the Integration page.
2. Find the integration on which the scheduled run is defined.
3. Select Schedule from the menu at the right.
   
   The Schedule and Future Runs page is displayed.

4. Click the Start Schedule box.
   
   The following message is displayed at the top of the page: Schedule is now active.

   Details about the schedule including the frequency and any expiration date are displayed. The Start Schedule button is changed to Stop Schedule.

5. If you want to pause the schedule run, click Pause Schedule at the far right.
6. If you want to resume the schedule run, click Resume Schedule. This toggles the button name to Pause Schedule.

---

**Note:** You can also pause a schedule from the Integrations page available under the Monitoring tab. For information, see Monitoring Integration Runs.

---

### Viewing Past and Present Integration Runs

You can view the status of past and present scheduled integration runs.

To view past and present integration runs:

1. Go to the Integration page.
2. Find the integration on which the scheduled run is defined.
3. Select Schedule from the menu at the right.
   
   The Schedule and Future Runs page is displayed.
4. Click View Past Runs.
   
   The Past Runs page is displayed. By default, all integration runs are displayed.
5. Filter the display of integrations:
   
   a. Click In Progress to display all integration runs currently in progress.
   b. Click Completed to display all completed integration runs.
   c. Click the dropdown list to filter the display of runs by 1 hour, 6 hours, 1 day, 2 days, or 3 days.
6. If a schedule run has failed (for example, the target FTP server did not have the correct write permissions), click the Resubmit icon at the far right to resubmit the schedule run.

   If you selected the Delete Files After Successful Retrieval checkbox on the Configure File Read page when configuring the inbound FTP Adapter, the file is deleted from the source directory if the file transfer is successful or unsuccessful this time.

   This action creates a RESUBMITTED RUN ID: number message to the right of the schedule name and original run ID. If you resubmit again, you end up with the following messages to the right of the schedule name:

   • RUN ID: number: The run ID for the first resubmission, which failed.
• **RESUBMITTED RUN ID: number.** The run ID for the latest submission.
• **ORIGINAL RUN ID: number.** The run ID for the initial submission.

7. Click the **RESUBMITTED RUN ID: number** message link to go to the Tracking page.

8. Click the file name of the instance.
   A graphical view of the integration flow is displayed.
   For example, if the resubmission resulted in a failure, details are displayed. For this example, the write portion of the integration failed because of a permissions issue.

9. Select **Actions > Audit Trail** to view specific details about the error, such as the target directory not being defined with write permissions.

**Viewing Future Runs**

You can view the status of future scheduled integration runs.

To view future runs:

1. Go to the Integration page.
2. Find the integration on which the scheduled run is defined.
3. Select **Schedule** from the menu at the right.
   The Schedule and Future Runs page is displayed.
4. Click **View Past Runs**.
5. Click **View Schedule**.
   Details about the future runs are displayed.
Editing an Integration Schedule

You can edit a schedule for an integration run.

To edit an integration schedule:

1. Go to the Integration page.
2. Find the integration on which the scheduled run is defined.
3. Select Schedule from the menu at the right.
   The Schedule and Future Runs page is displayed.
4. On the far right, click the Edit icon.

   ![Edit icon](image1.png)

5. Edit the schedule. For information about the fields you can edit, see Creating an Integration Schedule.

6. Click Save.

Deleting an Integration Schedule

You can delete a schedule for an integration run.

To delete an integration schedule:

1. Go to the Integration page.
2. Find the integration on which the scheduler run is defined.
3. Select Schedule from the menu at the right.
   The Schedule and Future Runs page is displayed.
4. Find the schedule in the list that you want to delete.
5. On the far right, click the Delete icon.

   ![Delete icon](image2.png)

6. Click Yes when prompted to confirm.

Monitoring Integration Runs

You can pause and resume scheduled runs for an integration from the Monitoring page.

To monitor integration runs:

1. On the Integration Cloud Service toolbar, click Monitoring.
2. In the navigator, click **Integrations**.

   For integrations that include source and target FTP adapter connections, the calendar icon is displayed. This page shows only active integrations. Integrations can be of any type (that is, with or without the FTP Adapter).

3. If you want to resubmit a run of an integration, click **Submit Now**. This button is available only for integrations that have an FTP Adapter as a trigger.

4. If you click **Push Integrations** under **Integrations** in the navigator, all integrations that cannot be scheduled are displayed (that is, integrations that do not have an FTP Adapter as a trigger).

5. If you click **Scheduled** under **Integrations** in the navigator, only scheduled integrations are displayed (that is, integrations that have an FTP Adapter as a trigger).

6. If you want to pause the scheduled runs, click the **Pause Schedule** button.

---

**Creating Ad-Hoc Integration Runs Using the REST API**

You can create ad-hoc runs on integrations on which a schedule has been defined from the REST API. This is useful for when you want to test a scheduled integration.

To create ad-hoc integration runs:

1. On the Integration Cloud Service toolbar, click **Designer**.

2. Click **Integrations**.

3. Find an integration on which a schedule is defined (indicated by the calendar icon).

4. Click the **Integration Details** icon at the far right.

5. Copy the URL from the **Submit Now Link** into a tool (such as SOAP UI) to test REST APIs. You can also use CURL commands from a terminal window to invoke the REST APIs.
6. Invoke the integration run.

7. Return to the Integrations page, and select **Schedule** from the list at the far right.
   The Schedule and Future Runs page is displayed.

8. Click the **View Past Runs** link in the upper right corner.
   Details about the ah-hoc integration run are displayed.
Administering Integration Cloud Service

The Integration Cloud Service dashboard provides you with the information and tools to monitor and manage your integrations in the runtime environment. Administration tasks can also include working outside the dashboard, such as when you activate or deactivate integrations.

Topics

- Monitoring Integration Cloud Services
- Managing Integrations
- Managing Errors
- Managing Business Identifiers for Tracking Fields in Messages
- Viewing Preinstalled Adapters and Registering Custom Adapters
- Sending System Status Reports and Service Failure Alerts by Email
- Setting Logging Levels and Downloading Diagnostic Logs
- Reporting Incidents

Monitoring Integration Cloud Services

Use the Integration Cloud Service dashboard to see how your integrations are performing. The dashboard provides multiple views for you to check your running services.

Topics

- Viewing the Dashboard
- Viewing System Health
- Viewing Runtime Health
- Viewing Design-Time Metrics
- Monitoring Integrations
- Monitoring Agents

Viewing the Dashboard

You can view information about how your integrations are performing on the Dashboard page.
To view the dashboard:

1. Access the dashboard through one of the following methods:
   a. In the Integration Cloud Service toolbar, click Monitoring.
   b. On the Integration Cloud Service Home page, click the Monitor diagram.

   The Dashboard page is displayed by default. If not, click the Dashboard tab.

The Dashboard page provides the following details:

- A list for selecting the time period for which to display integration information (for example, one hour, six hours, one day, two days, three days, or since the first activation).
- Success rate for messages. Click the percentage value or wording to access the Errors by Integration page.
- Number of initiated messages in the last three days. Click the value or wording to access the Tracking page.
- Number of failed messages in the last three days. Click the value or wording to access the Error Message Details page.
- Number and percentage of currently used connections. Click the value, percentage, or wording beneath the percentage to access the Errors by Connection page.
- Number and percentage of currently active integrations. Click the value, percentage, or wording beneath the percentage to access the Errors by Integration page.
- Number and percentage of scheduled integrations, including those currently paused. Click the value, percentage, or wording beneath the percentage to access the Integrations page listing all scheduled integrations.
- Activity streams link. Click the link to access the Runtime Health page to view the activity stream.
- Download Logs menu. Click the link to show options for downloading the Oracle Integration Cloud Service logs or diagnostics logs. If you are having problems with an integration, you can attach the diagnostic logs to a service request for help in debugging the issue.
- Download incidents link. Click to download the created incident report. For more information, see Reporting Incidents.
- Graphs showing the hourly and daily history of total, successful, and failed messages. You can place your cursor over the bars in each graph to display the total number of successful messages and failed messages.
Viewing System Health

You can view information about the system health of Oracle Integration Cloud Service components. As you navigate around Oracle Integration Cloud Service, you receive a system health state that is not older than five minutes. The only exception is the Messaging Service state, which may take longer than five minutes to update.

The state of system health is viewable from multiple locations in Oracle Integration Cloud Service:

- From the main banner of pages
- From the Integrations, Connections, and Lookups pages
- From the mapper or expression builder
- From the System Health page under the Monitoring tab

To view system health:

1. On any page of Oracle Integration Cloud Service or from the Integration page, Connections page, Lookups page, mapper, or expression builder, click the System Health icon in the upper right corner to display the status of system health. Green indicates that the service is running as expected. Red indicates that errors are occurring in the service that can impact your active integrations.

You can also view the status of system health from the Monitoring dashboard.
2. Access the Monitoring dashboard through one of the following methods:
   a. On the Integration Cloud Service toolbar, click Monitoring.
   b. On the Integration Cloud Service Home page, click the Monitor diagram.
3. In the navigator, click System Health.
4. View the current status of system services upon which Oracle Integration Cloud Service relies. A green checkmark indicates that the service is running as expected. A red triangle for a service indicates that errors are occurring that can impact your active integrations.

Viewing Runtime Health

You can view the runtime health of Oracle Integration Cloud Service.

To view the runtime health of Oracle Integration Cloud Service:

1. Access the Monitoring dashboard through one of the following methods:
   a. On the Integration Cloud Service toolbar, click Monitoring.
   b. On the Integration Cloud Service Home page, click the Monitor diagram.
2. In the navigator, click Runtime Health.
3. View the total number of messages received, total number of messages processed, total number of successful and failed messages, and the message success rate percentage. The graphs showing the hourly and daily history of total, successful, and failed messages that appeared on the Dashboard page are also provided. You can also view the activity stream for your running integrations, such as details about successful responses received from the target application, successful responses sent to the source application, and target application invocations.
4. Click **Refresh Activity Stream** to refresh the view to display the latest activities.

5. Click **Download Logs** to show options for downloading the Oracle Integration Cloud Service logs or diagnostics logs. The Oracle Integration Cloud Service logs provide more detailed logging information about payload activity at several points in the integration flow, such as the payload prior to data mapping and the payload after data mapping. For information about enabling tracing, see **Activating an Integration**. If you are having problems with an integration, you can attach the diagnostic logs to a service request for help in debugging the issue.

**Viewing Design-Time Metrics**

You can view the design-time metrics of Oracle Integration Cloud Service, including details about packages, integrations, connections, lookups, and agents.

To view the design-time metrics of Oracle Integration Cloud Service:

1. Access the Monitoring dashboard through one of the following methods:
   a. On the Integration Cloud Service toolbar, click **Monitoring**.
   b. On the Integration Cloud Service Home page, click the **Monitor** diagram.

2. In the navigator, click **Design-Time Metrics**.

3. View details about the following components in Oracle Integration Cloud Service:
   - The number of developed and prebuilt packages.
   - The state of integrations (draft (under construction), configured, active, and failed).
   - The state of connections (draft, configured, and in use).
   - The number of lookups.
   - The number of connectivity and execution agents.
4. Click the arrow for **Integrations** to display details about the number of integrations configured for the following:

- Performing file transfers
- Using the **Map Data** integration type
- Using undefined integrations
- Using message exchange pattern (MEP) types

5. Click the arrow for **Integrations** again to view how many integrations are using each adapter.

6. Click the arrows for **Connections** and **Agents** to view more specific details about those components.

### Monitoring Integrations

On the Integration Cloud Service dashboard, you can see how your running integrations are processing messages, such as how many messages have been received and processed, how many successful messages and errors have occurred, and the overall success rate.

To monitor integrations:

1. On the Integration Cloud Service toolbar, click **Monitoring**.

   The Monitoring dashboard is displayed.
2. In the navigator, click **Integrations**.
   A list of running integrations appears, along with processing information about the number of messages received, the number of messages processed, the number of successful messages, and the number of failed messages.

3. From the **Integrations** list, select the time period for which to display integration information (for example, one hour, six hours, one day, two days, three days, or since the first activation).

**Monitoring Agents**

You can monitor the agent groups and their associated on-premises agents in Oracle Integration Cloud Service.

To monitor an agent:

1. In the Integration Cloud Service toolbar, click **Monitoring**.
2. In the navigation panel on the left, click **Agents**.
3. The Agent Monitoring page shows details such as the time at which the agent was last updated and the on-premises agents associated with the agent groups.

   **Note:** If the agent status is red, you cannot select it in the Select an Agent Group dialog of the Connections page, even though the agent may be up and running.

4. Click the number above **AGENTS** or click the agent group name to see the on-premises agent associated with this group.
5. At the far right, click the information icon to display details about the agent group such as creation date and the last startup date of the on-premises agent.
6. Click **Sort By** to sort by agent name or the date at which the on-premises agent was last started.

   **Note:** When you shut down the agent server, several minutes pass before the agent is displayed as down on the Agent Monitoring page (as indicated by a red thunderbolt).

**Managing Integrations**

When you are ready for your integration to go live, you must activate the integration in Integration Cloud Service. You can also deactivate a running activation if you must make changes to it or if it is no longer needed.

**Topics**

- Activating an Integration
- Deactivating an Integration
- Modifying an Integration
- Viewing the Trigger, Invoke, and Enrichment Details of an Integration
• Cloning an Integration
• Creating a Draft of an Integration
• Deleting an Integration
• Reactivating Integrations After Instance Upgrade to View the Latest Business Identifier Tracking Behavior
• Filtering the Display of Integrations By Type
• Changing the Time Zone

Activating an Integration

Once you create an integration and the progress indicator shows 100 percent, you can activate that integration to the runtime environment. An integration shows as 100% and is eligible for activation after you have specified the source connection, the target connection, the data mappings, and the tracking fields.

To activate an integration:

1. If you are not already on the Integrations page, click Designer on the toolbar, then click Integrations.
2. In the Integrations list, locate the integration you want to activate and go to the far right end.
3. Above Pending Activation, click Activate.

The Confirmation dialog is displayed.

4. If you want to enable detailed tracing, click the Enable detailed tracing checkbox.

When this checkbox is selected, detailed logging information about messages processed by this integration flow at runtime is collected. For example, you see more detailed logging information about payload activity at several points in the integration flow, such as the payload prior to data mapping and the payload after data mapping. This can aid in troubleshooting issues. However, detailed tracing may also impact performance. To disable tracing, you must deactivate the integration, then reactivate it without selecting the Enable detailed tracing checkbox. For information about accessing logging information, see Viewing Runtime Health.

5. Click Activate.
An activation progress bar is displayed at the top of the dialog. If activation is successful, the status of the integration changes to **ACTIVE** in the list. If you selected to enable tracing, the words **TRACE ENABLED** are displayed next to **ACTIVE**.

![Activation Status](image)

To access the detailing trace logging information:

a. Click the Monitoring tab.

b. Click **Download Logs** to download Oracle Integration Cloud Service logs and diagnostics logs.

**Note:** If activation fails, an error message is displayed at the top of the Integrations page. To troubleshoot the activation error, click **Download diagnostic logs** to download the logs for diagnosing the issue.

6. View active integrations by clicking the integration name or selecting **View** from the menu at the far right of the integration. The active integration is displayed with a message saying **Viewing**.

Note the following details about read-only mode:

- No **Save** button and **Actions** button are displayed.
- There is no Connections Palette for adding adapters.
- You can click through multiple parts of the integration to view configuration details, such viewing the business identifiers under the **Tracking** tab, viewing the source-to-target and target-to-source mappings in the mapper, and viewing the configurations on the pages of the connection wizards, but you cannot modify anything.

**Deactivating an Integration**

You can deactivate an integration to stop it from processing any new messages. If you want to modify an active integration, you need to deactivate it first.

Deactivation is equivalent to undeployment of a project, which means all existing history, monitoring, and runtime data are lost. Integration Cloud Service does not support the notion of starting and stopping projects. With asynchronous patterns, the queue for the deactivated project is deleted and all messages associated with this queue are also deleted. Therefore, if there are pending requests unprocessed, they are lost after deactivation. The previous version is deactivated and all existing history, monitoring, and runtime data is lost.

1. In the Integration Cloud Service toolbar, click **Designer**.

The Designer Portal appears.
2. Click **Integrations**.

3. On the expanded Integrations page, find the integration you want to deactivate.

   To view only active integrations, select **Active** in the Integrations list. You can also filter by integration name or integration type (prebuilt, custom, or developed) to narrow down the list.

4. In the row containing the integration you want to deactivate, click the **Active** icon to deactivate the integration.

5. Click **Yes** on the dialog that appears. A deactivation progress bar is displayed at the top of the dialog.

### Modifying an Integration

You can modify an existing integration, including changing a source or target connection, reconfiguring the connection, and updating the data mapping. Changes to the source or target can cause changes to the existing mappings.

If the integration you want to modify is active, deactivate it first. See [Deactivating an Integration](#) for instructions.

To modify an integration:

1. In the Integration Cloud Service toolbar, click **Designer**.

   The Designer Portal appears.

2. Click **Integrations**.

3. On the Integrations page, find the integration you want to modify.

   You can search by entering a partial or complete integration name in the **Search** field or filter integrations by selecting an option from the **Filter By** list. From this list, you can filter by **Type** (Custom, Developed, and Prebuilt), **Pattern** (Map Data, Publish to Integration Cloud Service, Subscribe To Integration Cloud Service, File Transfer, and others), **Status** (Draft, Configured, Active, or Failed Activation), or **Style** (Template or Orchestration). Search or filter criteria are displayed in the banner above the returned list of integrations. To remove search or filter criteria, click the x icon in the banner.

4. On the row that contains the integration you want to change, click the integration name or click the vertical bars icon on the far right and select **Edit**.

5. To modify the name, package, or description, click the **Edit** icon on the right side.
6. To modify the source or target configuration, click the connection on the canvas and click Edit on the menu that is displayed.

7. Modify any of the open fields in the wizard that appears. See Connection Configuration Reference for instructions.

8. To assign a new connection as the source or target, click the connection to delete, then click Delete on the menu that is displayed.

9. Click the Show Palette icon on the right side and drag the new adapter from the Connections or Technologies panel on the right to the connection on the canvas that you want to replace. Configure the new connection. See Connection Configuration Reference for instructions.

10. To modify a data mapping, click the appropriate map icon in the middle of the integration and update the mappings. See Mapping Data of Using the Oracle Mapper.

11. When you are done making changes, click Save and then click Exit Integration.
Viewing the Trigger, Invoke, and Enrichment Details of an Integration

You can view the details associated with trigger, invoke, and enrichment endpoints of an integration.

To view the trigger, invoke, and enrichment details of an integration:

1. In the Integration Cloud Service toolbar, click Designer.
   
   The Designer Portal appears.

2. Click Integrations.

3. On the Integrations page, find the integration you want to view. You can filter the display of integrations by their current status on the left side of the page.

4. Click the trigger, invoke, or (if configured) enrichment endpoint of the integration.

5. Click the Details icon.

6. View the connection name, endpoint name, input payload, and output payload of the integration.

Cloning an Integration

Cloning an integration creates a new copy with identical connections and data mappings. You give the clone a new name, identifier, version number, and package name, but the remaining configuration is the same. You can reconfigure the clone after you create it.

Note: Integration versions follow a formatting convention of xx.yy.zzzz, where xx is the major version and yy.zzzz is the minor version. If you clone an integration (for example, version 1.00.0000) and change the minor version of the cloned integration to 1.10.0000, version 1.00.0000 is deactivated when you activate version to 1.10.0000. To keep both integrations active, change the major version of the cloned integration to 2.00.0000. This enables integration versions 1.00.0000 and 2.00.0000 to be active at the same time. For more information, see Creating an Integration.
To clone an integration:

1. In the Integration Cloud Service toolbar, click **Designer**.
   The Designer Portal appears.

2. Click **Integrations**.

3. On the Integrations page, find the integration you want to clone. You can filter the display of integrations by their current status on the left side of the page.

4. In the row containing the integration you want to clone, click the vertical bars icon on the far right and then click **Clone**.

5. In the dialog that appears, enter a name, unique identifier, version number, package name, and an optional description.
   
   You can include English alphabetic characters, numbers, underscores, and dashes in the identifier. Enter the version using numbers only in this format: `xx.xx.xxxx`.

6. Click **Clone**.

7. You can modify the clone in any of the ways described in **Modifying an Integration**.

**Creating a Draft of an Integration**

Creating a draft of an integration creates a new copy with the same integration information. This action represents an easier way to create an integration. During draft creation, you must update the version of the integration and optionally update the package and description. However, unlike a cloned integration, you *cannot* update the integration name or identifier.

To create a draft of an integration:

1. In the Integration Cloud Service toolbar, click **Designer**.
   The Designer Portal appears.

2. Click **Integrations**.

3. On the Integrations page, find the integration for which you want to create a draft. You can filter the display of integrations by their current status on the right side of the page.
4. In the row containing the integration for which you want to create a draft, click the vertical bars icon on the far right and then click Create Draft.

5. In the dialog that appears, modify the version number. Not modifying this field results in the following error:

   The draft version of Integration "integration_name" you are trying to create already exists in the system.

6. Optionally modify the package name and description. You cannot modify the integration name or identifier.

7. Click Create Draft.

Deleting an Integration

You can delete an integration that is no longer needed.

Make sure the integration you want to delete is not active. To deactivate the integration, see Deactivating an Integration.

To delete an integration:

1. In the Integration Cloud Service toolbar, click Designer.

   The Designer Portal appears.

2. Click Integrations.

3. On the Integrations page, find the integration you want to delete. You can filter the display of integrations by their current status on the left side of the page.

4. In the row containing the integration you want to delete, click the vertical bars icon on the far right and then click Delete.
5. Click Yes on the dialog that appears.

**Reactivating Integrations After Instance Upgrade to View the Latest Business Identifier Tracking Behavior**

After your Integration Cloud Service instance is upgraded to a newer version, you must reactivate your integrations to view the latest and correct business identifier behavior in the Tracking page.

**Filtering the Display of Integrations By Type**

You can filter the display of integrations by their type (custom, user-developed, or prebuilt).

To filter the display of integrations by type:

1. In the Integration Cloud Service toolbar, click **Designer**.
   
   The Designer Portal appears.

2. Click **Integrations**.

3. Select the **Filter by** list to filter the display of integrations.

4. Select the **Sort By** list to filter the display of integrations by the last update or name.

**Changing the Time Zone**

You can change the time zone that is displayed in Integration Cloud Service.

To change the time zone:

1. In the upper right corner, click the **username** dropdown list, then select **Preferences**.

2. From the **Time Zone Settings** list, select the time zone you want to use.

3. Click **Save**.

4. Go to the Integrations page and note that the time zone is changed in the message below the status of the integration and inside the information icon at the far right.

   The time zone change is also shown in other parts of Integration Cloud Service in which the time is displayed (for example, on the Tracking page).
Managing Errors

You can manage errors from the Errors pages in Integration Cloud Service at the integration level, connection level, or specific integration instance level.

Topics

• Managing Errors by Integration
• Managing Errors by Connection
• Managing Errors by Integration Instance
• Resubmitting Failed Messages
• Viewing the Status of Message Recovery

For more information about error management, see About Error Management.

Managing Errors by Integration

You can manage errors by the integration in which they occurred. Management tasks consist of viewing the total error count for an integration over a specific time period, discarding (removing) all errors for an integration, and viewing more specific error message details by clicking the integration name or the total error count.

Topics

• Viewing Errors By Integration Name Over a Specific Time Period
• Discarding Errors by Integration Name

Viewing Errors By Integration Name Over a Specific Time Period

You can view errors by integration name over a specific time period.

To view errors by integration name or the total number of integration errors that have occurred over a specific time period:

1. On the Integration Cloud Service toolbar, click Monitoring.

2. In the navigation pane, click Errors.

   The Errors By Integration page is displayed. Any integration errors that are displayed by default are those that occurred within the selected time period.

3. From the Errors by Integration menu, select the time period for which to display integration errors.

   Any errors that occurred during the selected time period are displayed immediately below the menu. Error details consist of the integration name and the total number of errors that occurred in that integration.
4. Click the integration name or total error count to access the Error Message Details page. This page provides information about the business identifiers defined in the integration, the instance identifier of the integration, the location of the error, the time at which the error occurred, the audit trail, the message payload, the specific error message, and other information. You can also submit errors for recovery. For more information about the Error Message Details page, see Managing Errors by Integration Instance.

Discarding Errors by Integration Name

You can discard errors based on the integration in which they occurred. A discarded error message is removed from the Errors By Integration page and can be seen in a discarded state on the Tracking page. You cannot perform any further operations on a discarded message, including recovery. After a certain time period, the error message is permanently deleted from the server.

To discard errors by integration name:

1. On the Integration Cloud Service toolbar, click Monitoring.

2. In the navigation pane, click Errors.

   The Errors By Integration page is displayed.

3. Perform any necessary error filtering by following the instructions in Viewing Errors By Integration Name Over a Specific Time Period.

4. For the integration in which to discard errors, click the Discard button at the far right. For synchronous integrations, the Discard button is not visible.
5. Click Yes when prompted to confirm. This action discards all error messages in all instances of that integration.

Managing Errors by Connection

You can manage errors by the source or target connection in which they occurred. Management tasks consist of viewing the total error count for a connection over a specific time period, discarding all errors for a connection, and viewing more specific error message details by clicking the connection name or the total error count.

Topics

- Viewing Errors By Connection Name or the Total Error Count Over a Specific Time Period
- Discarding Errors by Connection Name

Viewing Errors By Connection Name or the Total Error Count Over a Specific Time Period

You can view errors by connection name or the total number of connection errors that have occurred during a specific time period.

To view errors by connection name or the total number of connection errors that have occurred over a specific time period:

1. On the Integration Cloud Service toolbar, click Monitoring.
2. In the navigation pane, click Errors, then click Errors By Connection.

   The Errors By Connection page is displayed. Any connection errors that are displayed by default are those that occurred within the selected time period.

3. From the menu, select the time period for which to display connection errors.

   Any errors that occurred during the specified time period are displayed immediately below the menu. Error details consist of the connection name and the total number of errors that occurred in that connection.
4. Click the connection name or total error count to access the Error Message Details page. This page provides information about the business identifiers defined in the integration, the instance identifier of the integration, the location of the error, the time at which the error occurred, the audit trail, the message payload, the specific error message, and other information. You can also submit errors for recovery. For more information about the Error Message Details page, see Managing Errors by Integration Instance.

**Discarding Errors by Connection Name**

You can discard errors based on the connection in which they occurred. A discarded error message is removed from the Errors By Connection page and can be seen in a discarded state on the Tracking page. You cannot perform any further operations on a discarded message, including recovery. After a certain time period, the error message is permanently deleted from the server.

To discard errors by connection name:

1. On the Integration Cloud Service toolbar, click Monitoring.

2. In the navigation pane, click Errors, then click Errors By Connection.
   
The Errors By Connection page is displayed.

3. Perform any necessary error filtering by following the instructions in Viewing Errors By Connection Name or the Total Error Count Over a Specific Time Period.

4. For the connection in which to delete errors, click the Discard button at the far right.

5. Click Yes when prompted to confirm. This action discards all error messages in that connection.

**Managing Errors by Integration Instance**

You can manage errors by the specific integration instance in which they occurred.
Management tasks consist of viewing the business identifiers defined for the integration, the instance identifier of the integration, the location of the error, the time at which the error occurred, the audit trail, the message payload, and the specific error message. You can also discard failed messages and resubmit failed messages for recovery.

**Topics**

- Viewing Errors by Integration Name, Instance Identifier, Location, or Time of Occurrence Over a Specific Time Period
- Viewing the Integration Instance in Which Errors Occurred
- Discarding Errors by Integration Instance
- Viewing Specific Error Details
- Viewing the Audit Trail of a Failed Integration Instance
- Viewing Business Identifiers in Failed Integration Instances
- Viewing the Message Payload of a Failed Integration Instance

**Viewing Errors by Integration Name, Instance Identifier, Location, or Time of Occurrence Over a Specific Time Period**

You can display errors by integration name, instance identifier, error location, or the time of occurrence over a specific time period. This provides you with a more granular view of integration failure details.

To display errors by integration name, instance identifier, error location, or the time of occurrence over a specific time period:

1. On the Integration Cloud Service toolbar, click **Monitoring**.
2. In the navigation pane, click **Errors**, then click **Error Message Details**.
   
   The Error Message Details page is displayed. Any errors that are displayed by default are those that occurred within the selected time period.
3. From the menu, select the time period for which to display error information.

   ![Error Message Details](image)

   Any errors that occurred during the specified time period are displayed immediately below the menu. On the right side, the **View Error** icon is always visible. The **Resubmit** and **Discard** icons are visible based on the type of
integrated you created (asynchronous or synchronous). You can also see how many times an error has been resubmitted.

4. Click the primary business identifier name to access a graphical view of the integration instance. This page provides information about the business identifiers defined for an instance, the instance identifier of the integration, the location of the error, the time at which the error occurred, the audit trail, the message payload, a button for discarding the error, and other information.

**Note:** The search facility on the Error Message Details page is case sensitive.

### Viewing the Integration Instance in Which Errors Occurred

You can view the integration instance in which errors occurred. From the integration instance page, you can perform multiple tasks, including viewing business identifiers in the integration, viewing the audit trail, viewing error messages, and discarding errors.

To view the integration instance in which errors occurred:

1. On the Integration Cloud Service toolbar, click **Monitoring**.
2. In the navigation pane, click **Errors**, then click **Error Message Details**.
3. Click the business identifier included in the failed integration instance.

The integration is displayed. The direction in which the error occurred is indicated by the color red. The primary business identifier and instance identifier of the integration are displayed above the integration.
You can perform multiple tasks on this page, including viewing all business identifiers and values in the integration, viewing the audit trail, viewing errors, viewing the payload, and discarding errors.

**Discarding Errors by Integration Instance**

You can discard errors by integration instance in several locations. A discarded error message is removed from the Errors Message Details page and can be seen in a discarded state on the Tracking page. You cannot perform any further operations on a discarded message, including recovery. After a certain time period, the error message is permanently deleted from the server.

To discard errors by integration instance:

1. On the Integration Cloud Service toolbar, click **Monitoring**.
2. In the navigation pane, click **Errors**, then click **Error Message Details**.

   The Error Message Details page is displayed. Any errors that are displayed by default are those that occurred within the selected time period.

3. Select the appropriate method for discarding errors:
   a. To discard all errors, click **Select All**, then click **Discard**.
   b. To discard selected errors, select the check boxes for the appropriate errors, then click **Discard**.
   c. To discard a single error, select the checkbox for the error, then click **Discard** or simply click **Discard** at the far right of the error to discard.

   You can also view and discard errors on the integration instance page.

4. Click the business identifier included in the failed instance.
The integration instance is displayed.

5. To delete the error, click **Actions**, then click **Discard**.

6. Click **Yes** when prompted to confirm your selection.

**Viewing Specific Error Details**

You can view specific error details by integration instance.

Error message details can be displayed in two parts: a summarized error message for easy understanding and resolution and, if necessary, a more specific error message if more detailed troubleshooting is required.

To view specific error details:

1. On the Integration Cloud Service toolbar, click **Monitoring**.

2. In the navigation pane, click **Errors**, then click **Error Message Details**.

   The Error Message Details page is displayed. Any errors that are displayed by default are those that occurred within the selected time period.

3. View details about a specific error in either of two ways:

   a. Click **View Error** in the column at the right.

      A summarized version of the error message for easy understanding and resolution is displayed.

   b. If a more detailed description of the error message is required, expand **Detail Error Message**.
a. Click the business identifier included in the failed instance.

The integration instance is displayed.

b. In the upper right corner, click View Error. A summarized version of the error message for easy understanding and resolution is displayed.

c. If a more detailed description of the error message is required, expand Detail Error Message.

d. If you select View > Audit Trail, the error in the context of the audit trail is displayed to assist in identifying where the error occurred in the overall processing.

Viewing the Audit Trail of a Failed Integration Instance

You can view the audit trail of a failed integration instance. This enables you to see where an integration error occurred in the message flow.

To view the audit trail of a failed integration instance:

1. On the Integration Cloud Service toolbar, click Monitoring.
2. In the navigation pane, click **Errors**, then click **Error Message Details**.

3. Click the business identifier included in the instance you want to view.

   The instance integration is displayed. The direction in which the error occurred is indicated by the color red.

4. In the upper right corner, click **Actions**, then click **View Audit Trail**.

   The audit trail shows details about the movement of the message through the integration, including where the failure occurred.

---

**Viewing Business Identifiers in Failed Integration Instances**

You can view the business identifiers included in failed integration instances.

To view business identifiers in failed integration instances:

1. On the Integration Cloud Service toolbar, click **Monitoring**.

2. In the navigation pane, click **Errors**, then click **Error Message Details**.

   The Error Message Details page is displayed. Any errors that are displayed by default are those that occurred within the selected time period.
3. To search for a specific business identifier, enter the exact business identifier value in the search field, then click Search. For example if business identifier OrgId has a value of test2, enter test2.

Any business identifiers with the specified value are displayed.

4. To view details about the business identifiers included in a failed integration instance, click the business identifier.

The integration instance is displayed.

5. Click Business Identifiers to display all the defined business identifiers and values in the integration.

For more information about business identifiers, see Assigning Business Identifiers and Managing Business Identifiers for Tracking Fields in Messages.

Viewing the Message Payload of a Failed Integration Instance

You can view the message payload of a failed integration instance.

To view the message payload of a failed integration instance:

1. On the Integration Cloud Service toolbar, click Monitoring.
2. In the navigation pane, click Errors, then click Error Message Details.
3. Click the business identifier included in the instance you want to view.

The instance integration is displayed. The direction in which the error occurred is indicated by the color red.
4. In the upper right corner, click Actions, then click View Payload.

The audit trail shows the message payload of the integration instance.

Fault Payload

```xml
<?xml version="1.0" encoding="UTF-16"?>
<Body xmlns="http://schemas.xmlsoap.org/soap/envelope/">
  <ns1:mergeAccount xmlns="">
    <ns1:soap:Body xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
      xmlns:ns1="http://xmlns.oracle.com/apps/hcm/employment/absences/absenceCaseServiceV2/"
      xmlns:ns1:orafault="http://xmlns.oracle.com/orafaults/schema/oracle-fault-11.0_0"
      xmlns:ns1:errors="http://xmlns.oracle.com/aditbcv/errors"
      xmlns:ns1:ptrn="http://schemas.xmlsoap.org/ws/2003/05/partner-link"
      xmlns:ns1:qprm="http://xmlns.oracle.com/cloudadapter/osc/AccountUpdate_REQUESTTypes"
      xmlns:ns1:nprm0="http://xmlns.oracle.com/cloudadapter/osc/AccountUpdate_REQUEST"
      xmlns:ns1:wsdl="http://schemas.xmlsoap.org/wsdl/"
      xmlns:ns1:nsmp0="http://xmlns.oracle.com/cloudadapter/osc/AccountUpdate_REQUESTTypes"
      ns1:nsmp3="http://xmlns.oracle.com/apps/crmCommon/salesParties/commonService/"
      xmlns:ns1:mp3="http://xmlns.oracle.com/apps/crmCommon/salesParties/commonService/"
      xmlns:ns1:mp1="http://xmlns.oracle.com/apps/crmCommon/salesParties/commonService/"
      xmlns:ns1="">
    </ns1:nsmp3:SourceSystem> RNOW</ns1:nsmp3:SourceSystem>
  </ns1:nsmp3:SourceSystemReferenceValue="875">Rsmp3:SourceSystemReferenceValue>
  <ns1:nsmp3:OrganizationName>Act90281</ns1:nsmp3:OrganizationName>
  <ns1:nsmp3:PrimaryAddress>
    <ns1:nsmp3:PrimaryAddress>
      <ns1:nsmp3:DeleteFlag>true</ns1:nsmp3:DeleteFlag>
    </ns1:nsmp3:PrimaryAddress>
  </ns1:nsmp3:PrimaryAddress>
</ns1:nsmp3:SourceSystem>
</ns1:mergeAccount>
</Body>
```

Resubmitting Failed Messages

You can manually resubmit failed messages. Resubmitting a failed message starts the integration from the beginning.

All faulted instances in asynchronous flows in Integration Cloud Service are recoverable and can be resubmitted. Synchronous flows cannot be resubmitted. You can resubmit errors in the following ways:

- Single failed message resubmissions
- Bulk failed message resubmissions

Error instances that are resubmitted and successfully resolved are removed from the error list. If an instance is resubmitted and is in progress, a state of In Progress is
displayed in the list. During this state, additional resubmittals of this error instance are not permitted.

**Note:** Do not discard a message that you want to resubmit. A discarded message cannot be resubmitted.

To resubmit failed messages:

1. On the Integration Cloud Service toolbar, click **Monitoring**.
2. In the navigation pane, click **Errors**.
3. From the tabs on the left, select the level of message resubmission to perform, then see below for instructions.
   - **Errors By Integration**: For resubmitting all failed messages in an integration.
   - **Errors By Connection**: For resubmitting failed messages in a connection.
   - **Error Message Details**: For resubmitting failed messages in an integration instance.

**Resubmitting All Failed Messages in an Integration**

You can resubmit all failed messages that occurred in an integration.

To resubmit failed messages in an integration:

1. In the navigation pane, click **Errors By Integration**.
2. Find the integration in which to resubmit failed messages.
3. At the far right, click the **Resubmit** icon (second from the end) to resubmit the messages. The **Resubmit** icon is not visible for synchronous integrations.
4. Click **Yes** when prompted to confirm.

**Resubmitting Failed Messages in a Connection**

You can resubmit all failed messages that occurred in a connection.

To resubmit failed messages in a connection:

1. In the navigation pane, click **Errors By Connection**.
2. Find the integration in which to resubmit failed messages.
3. At the far right, click the **Resubmit** icon (second from the end) to resubmit the messages.

4. Click **Yes** when prompted to confirm.

**Resubmitting Failed Messages in an Integration Instance**
You can resubmit all failed messages that occurred in a specific integration instance.
To resubmit failed messages in an integration instance:

1. In the navigation pane, click **Errors**, then click **Error Message Details**.

   The Error Message Details page is displayed. Any integration errors that are displayed by default are those that occurred within the selected time period.

2. Select the appropriate method for resubmitting errors.

   a. For single instance resubmissions, optionally click the checkbox, then click the **Resubmit** icon (middle icon at the far right) to resubmit the message.

   b. For bulk instance resubmissions, click the appropriate checkboxes, then click **Resubmit** above the integration instances to resubmit the messages.
c. Click Yes when prompted to confirm.

**Viewing the Status of Message Recovery**

You can search for and view the status of failed messages that have been submitted for recovery on the Errors by Integration, Errors by Connection, or Error Message Details page.

1. On the Integration Cloud Service toolbar, click Monitoring.
2. In the navigation pane, click Errors.
3. Submit a failed message for recovery on the Errors by Integration, Errors by Connection, or Error Message Details page.
   This submittal creates a unique job ID for the error message recovery process.
4. Click Error Recovery Jobs.
5. In the Search field, enter a partial or complete job ID of the error message recovery process.
6. View the status of message recovery:
   - **Received**: Recovery is still in progress.
   - **Success**: Recovery succeeded.
   - **Errors**: Recovery failed.
Managing Business Identifiers for Tracking Fields in Messages

You can view the status of business identifiers included in integrations on the Tracking page.

You can also view the message payload of an instance you are tracking.

Topics

- Tracking Business Identifiers in Integrations During Runtime
- Tracking Business Identifiers in Integrations in Which Routing Paths Are Defined
- Filtering the Display of Business Identifiers in Integrations
- Viewing an Instance Payload

For more information about business identifiers, see Assigning Business Identifiers for Tracking Fields in Messages.

Tracking Business Identifiers in Integrations During Runtime

You can track fields in messages on which you have defined business identifiers on the Tracking page during runtime. These fields are only available for tracking on the Tracking page if you defined a primary business identifier in the Business Identifiers for Tracking dialog during design time.

To track business identifiers in integrations during runtime:

1. On the Integration Cloud Service toolbar, click **Monitoring**.
2. In the navigation pane, click **Tracking**.
   
   The Tracking page is displayed.

3. From the menu, select the time period during which to search for business identifiers in messages.
Results are displayed for any integration on which a primary business identifier is set, including the business identifier and value, the instance identifier of the integration, and the state of the integration (for example, completed, failed, or aborted).

4. Click the business identifier to access a graphical display of the integration instance.

This page provides information about the business identifiers and values defined for the integration, the instance identifier of the integration, any error message, the audit trail, the payload message, a button for discarding an error, and other information. The entire message flow is tracked through the integration. Successful message flows are indicated by green arrows.

If you click a business identifier for an orchestrated integration, similar information is displayed. The entire message flow is tracked through the integration. Successful
message flows are indicated by green arrows. Any message flow errors that occur are indicated by red arrows.

5. Click **Actions > Audit Trail** to view the message flow. The audit trail shows details about the movement of the message through the integration, including where any failures occurred. For orchestrated integrations, the message flow through each activity (for example, any defined switch activity branches) is shown.

**Note:**

- If you enter a primary business identifier in the Search field, but do not click the Search button, then select a value from the time period dropdown list, note that the instances are filtered considering the string entered in the Search field, even though the Search button was not clicked. This is the expected behavior and is true for other landing pages in Integration Cloud Service.
- The search facility on the Tracking page is case sensitive.

**Tracking Business Identifiers in Integrations in Which Routing Paths Are Defined**

If the integration in which you defined business identifiers also includes definitions for routing paths, you can view the value of the business identifier, the status of the routing path taken based on the business identifier value, the routing expression logic in the blue header above the integration, and the status of the overall integration flow. The status of the routing path taken and the overall integration flow are indicated by color (green indicates success and red indicates failure).

To track business identifiers in integrations in which routing paths are defined:

1. On the Integration Cloud Service toolbar, click **Monitoring**.

2. In the navigation pane, click **Tracking**.

   The Tracking page is displayed.

3. From the menu, select the time period during which to search for business identifiers in messages.
4. Click the business identifier to access a graphical display of the integration instance.

The page shows (from top to bottom) the value of the business identifier, the status of the routing path taken based on the business identifier value, the routing expression logic in the blue header above the integration, and the status of the overall integration flow. Several examples of what can potentially be displayed are shown below.

- The following example shows that the business identifier **Party ID** value is 11. Based on this value, the IF portion of the routing expression logic (**partyid < 12.0**) completed successfully (as indicated by green). Therefore, the ELSE portion was never taken (as indicated by gray). Message delivery in the overall integration flow (request and response parts) also completed successfully (also indicated by green).

If the business identifier **Party ID** value had been 12 or greater, the IF portion of the routing expression logic (**partyid < 12.0**) would not have been taken and the ELSE portion would have been taken and displayed in green.

- The following example shows that the business identifier **Party ID** value is 11. Based on this value, the IF portion of the routing expression logic (**partyid < 12.0**) completed successfully (as indicated by green). However, the message delivery in the overall integration flow failed due to an error with the target connection (indicated by red).
The following example shows that the business identifier **Party ID** value is **12**. Therefore, the routing expression logic for the IF \((\text{partyid} < 12.0)\) and ELSE \((\text{partyid} > 21.0)\) portions is not satisfied and neither path is taken. The triangle is displayed in red. Therefore, the request message was never delivered to the target in the overall integration and the integration is displayed as unsuccessful (indicated by red).

If you select **Actions > Audit Trail** in the upper right corner, the following message is displayed:

Failed to send to target because all routing expressions failed on evaluation.

The following example shows that the business identifier **Party ID** value is **12**. In this example, only a single routing expression is defined \((\text{partyid} < 12.0)\) in the routing expression logic in the blue header above the integration). Because only a single routing expression is defined, no routing diagram is displayed. The request message is never delivered to the target and the overall integration flow is unsuccessful (indicated by red).
Filtering the Display of Business Identifiers in Integrations

You can filter the display of business identifiers on the Tracking page during runtime.

To filter the display of business identifiers in integrations:

1. On the Integration Cloud Service toolbar, click Monitoring.
2. In the navigation pane, click Tracking.

   The Tracking page is displayed.

3. From the Filter by list, select a display method. The primary identifier is not displayed as a filter. All other identifiers are displayed as filters.

   • Message > Additional Business Identifiers
      a. Begin entering the integration name to display names that begin with those letters or select an integration from the dropdown list to see the available tracking fields.
         Any business identifiers associated with the integration are displayed.
      b. To filter, enter the exact business value for the business identifier.
      c. Click Set Filter.
   
   • Integrations
      a. Begin entering the integration name to display names that begin with those letters or select an integration from the dropdown list to see the available tracking fields.
      b. Click Set Filter.
   
   • Run id
      a. Enter the run ID value for the scheduled integration.
      b. Click Set Filter.
Viewing an Instance Payload

During development and debugging, it is often useful to view an instance message payload.

To view an instance message payload:

1. On the Integration Cloud Service toolbar, click **Monitoring**.
2. In the navigation pane, click **Tracking**.

   The Tracking page is displayed.

3. From the menu, select the time period during which to search for business identifiers in messages.

Results are displayed for any integration on which a primary business identifier is set, including the business identifier and value, the instance identifier of the integration, and the state of the integration (for example, completed, failed, or aborted).
4. Click the business identifier to access a graphical display of the integration instance.

This page provides information about the message payloads, business identifiers and values defined for the integration, the instance identifier of the integration, any error message, the audit trail, the message payload, a button for discarding an error, and other information.

5. Click the **Actions**, then click the **View Payload** link.

The message payload is displayed.
Viewing Preinstalled Adapters and Registering Custom Adapters

You can view the adapters preinstalled with Oracle Integration Cloud Service and register user-created, custom adapters in the Oracle Public Cloud.

Viewing Preinstalled Adapters

1. In the Integration Cloud Service toolbar, click Designer.

   The Adapters page show the following categories of registered adapters in Oracle Integration Cloud Service

   - **Preinstalled**: Adapters included with your instance of Oracle Integration Cloud Service (for example, adapters to which you have subscribed and adapters that are automatically included).
   - **Private**: Custom adapters that you have created and registered.
   - **Marketplace**: Adapters included with the packages imported from the Oracle Marketplace.
3. Click the adapter name or select View from the menu at the far right to display information about the adapter.
If you want to delete an adapter, select **Delete** from the menu at the far right. You **cannot** delete adapters identified as **Preinstalled**.

**Uploading and Registering Custom Adapters**

You can upload and register custom cloud adapters that you have designed. During the upload, the adapter is deployed to Oracle Integration Cloud Service and validated. For information about designing custom cloud adapters, see *Developing Custom Oracle Cloud Adapters*.

1. Click **Register**.
2. Click **Browse** to select the adapter JAR file to upload, then click **Register**.

During upload, the adapter is deployed to Oracle Integration Cloud Service and validated to ensure security. If the upload is successful, a message is displayed at the top of the page and the adapter is displayed in the list with the words **Private**. Though multiple versions of the adapter can be registered, only the latest active version is shown on this page.

If the upload is unsuccessful, possible reasons are as follows:

- Adapter JAR file is invalid (missing the `cloud-adapter.xml` file)
• Display name for the adapter is missing

• Adapter has an invalid value for the adapterPlugin ID (for example, with special characters)

• Adapter has an adapterPlugin ID similar to any preinstalled adapter

  The uploaded adapter JAR is also validated for white listing. In the context of cloud adapters, this refers to the process of scanning the Java .class files in the adapter archive and enforcing policies defined in the white list configuration file. When validation fails, along with the failure message, there is a text report link that shows the warnings and errors that caused the adapter upload to fail.

3. Go to the Connections page to configure the adapter. For information, see Creating a Connection.

Sending System Status Reports and Service Failure Alerts by Email

You can notify users by email when a service failure occurs (for example, the runtime or storage service is down) or with hourly or daily reports about the total messages received, total messages processed, successful messages, failed messages, and successful message rate.

**Note:** This is a system level setting. Therefore, user A cannot create one notification setup while user B creates another notification setup. User B can see the notification setup created initially by user A and can modify it.

To send system status reports and service failure alerts by email:

1. From the Oracle Integration Cloud Service home page, click the Administration tab in the upper right corner.

2. Click Notifications.

3. Select when to send an email notification:
   • Send an alert when a service failure is detected
   • Send an hourly detailed report
   • Send a daily detailed report

4. In the Distribution list field, enter the email address to which to send the reports and alerts. You can specify multiple email addresses, each separated by commas.

5. Click Save.

6. Click Send Now to receive an immediate email about system status.

7. To stop receiving alerts and reports, click Delete, then click Yes when prompted to confirm.

8. To revert to your previously saved configuration, click Revert.
Setting Logging Levels and Downloading Diagnostic Logs

You can set logging levels and download diagnostic logs in Oracle Integration Cloud Service. You can also obtain the impacted POD name from the diagnostic logs.

To set logging levels and download diagnostic logs.

1. From the Oracle Integration Cloud Service home page, click the Administration tab in the upper right corner.

   **Note:**
   
   • Changing logging levels from their default values can fill up disk space and degrade system performance. Ensure that you reset the logger level to the default level when you have completed troubleshooting.
   
   • When you use the search facility, only the first ten results are displayed, even if there are more.

2. Click Logging Levels.

   The loggers available for configuration are displayed. If the logger level is inherited from a parent logger, that information is displayed.

3. Change the logger level of any logger.

4. To revert to the previous setting before clicking Save, click Revert.

5. Click Save.

   A message is displayed at the top of the page:
   
   Logger levels updated successfully. Be sure to reset logger level to the default level when troubleshooting has been completed.

6. Click the Monitoring tab.

   **Note:** You can also access the diagnostic logs directly from the Integrations page if your integration activation fails. Click the Download diagnostic logs link at the top of the page. For more information, see Activating an Integration.

7. From the Download Logs dropdown list, select Download Diagnostic Logs.

   Note that the downloaded ZIP file name includes the WebLogic Server domain name (the same as your POD name) prepended to the front. For this example, the POD name of domain_ics_expanded is prepended to the front: domain_ics_expanded-diagnostic-logs-number.zip. This enables you to know the POD from which the file is being downloaded.

   You can also get the POD name from inside the AdminServer-diagnostic.log file that is included in the ZIP file.

8. Unzip the file, and within the expanded directory structure, open AdminServer-diagnostic.log.
9. If the logger level is set to NOTIFICATION, this file also includes the WebLogic Server domain name (the POD name), which is written to the file every 30 minutes (for this example, domain_ics_expanded is also the name).

   [2016-11-09T12:00:00.413-08:00] [AdminServer] [NOTIFICATION] [ICS-10071]
   [oracle.ics] [tid: [ACTIVE].ExecuteThread: ©5© for queue: 'weblogic.kernel.Default (self-tuning)'][user: <anonymous>] [ecid: f1xa8364-21dc-4c08-8843-a57b23b9bde2-000051f5,0] [APP: icswebapp] Weblogic
domain name is "domain_ics_expanded".

An environment.txt file is part of the downloaded ZIP file. It contains details regarding the Oracle Integration Cloud Service, including the version, mode, and POD name.

**Reporting Incidents**

You can report incidents for problematic issues that occur during design time (for example, being unable to open an integration, the failure of connection testing, or the failure of artifact regeneration).

1. From the *username* menu in the upper right corner of the page, select **Report Incident**.
   
   The Report Incident dialog is displayed.

2. Enter a meaningful name and description of the incident to help others find and understand this incident.

3. Click **Create**.
   
   An incident is created and a message is displayed at the top of the page. Remember the incident ID number.

   Incident report successfully created with ID: "number". You can download it right now or later from the Monitoring dashboard.

4. Click the **Monitoring** tab.

5. Click **Download Incident**.

6. Enter the incident ID number, then click **Download**.

7. Save the ZIP file of incident logs to your local drive. The ZIP file includes a readme file with specific details, including the name and description you entered in the Report Incident dialog. If you open a service request with Oracle Support Services, share this information.
When you add an adapter to a trigger (source) or an invoke (target) in an integration, a wizard prompts you to configure how the data is processed for that connection, including the type of operation to perform, the business objects or fields to use, and so on. The properties you can configure vary by each type of adapter. Click any of the topics below to read more about the properties you can configure for each type of adapter.

**Topics**
- Configuring Basic Information Properties
- Configuring Salesforce Properties
- Configuring Source Integration Cloud Service Messaging
- Reviewing Configuration Values on the Summary Page

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

**Topics**
- What You Can Do from the Basic Info Page
- What You See on the Basic Info Page

**What You Can Do from the Basic Info Page**
You can specify the following values on the Basic Info page. The Basic Info page is the initial wizard page that is displayed whenever you drag an adapter to the section of the integration canvas supported by your adapter.

- Specify a meaningful name.
- Specify a description of the responsibilities.

**What You See on the Basic Info Page**
The following table describes the key information on the Basic Info page.
Configuring Salesforce Properties

The Salesforce Adapter enables you to create integrations with a Salesforce application.

The following sections describe the wizard pages that guide you through configuration of the Salesforce adapter as a trigger and invoke in an integration. Postconfiguration tasks are also provided.

**Topic**

- Understanding Salesforce Cloud Constraints
- Configuring Basic Information Properties
- Configuring Salesforce Trigger Outbound Messaging Properties
- Configuring Salesforce Trigger Response Properties
- Configuring Salesforce Trigger Callback Response Properties
- Configuring Salesforce Invoke Basic Information Properties
- Configuring Salesforce Target Operations Properties
- Configuring Salesforce Target Headers Properties
- Configuring Salesforce Invoke Custom Operations Properties
- Reviewing Configuration Values on the Summary Page
- Performing Salesforce Postconfiguration Tasks

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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 dashes in the name. You cannot include the following:  
  - Blank spaces (for example, *My Inbound Connection*)  
  - Special characters (for example, #;836 or righ(t)now4)  
  - Multibyte characters |
| What does this endpoint do? | Enter an optional description of the connection’s responsibilities. For example: This connection receives an inbound request to synchronize account information with the cloud application. |
Understanding Salesforce Cloud Constraints

You must be aware of the following constraints before configuring the Salesforce Adapter.

- The Salesforce Adapter uses the SalesForceDotCom (SFDC) API for all activities. Therefore, it is subject to any Salesforce API limitations. The limitations are defined in the Salesforce Limits Quick Reference Guide.
- Not all the Push Topic queries are supported by Salesforce. See Supported Push Topic Queries and Unsupported PushTopic Queries.
- Client applications must adhere to Salesforce’s SOAP API support policy and backward compatibility terms. These terms are available at SFDC SOAP API Support Policy.

Configuring Salesforce Trigger Outbound Messaging Properties

Enter the Salesforce trigger outbound messaging values for your integration.

Topics

- What You Can Do from the Salesforce Cloud Trigger Outbound Messaging Properties Page
- What You See on the Salesforce Cloud Trigger Outbound Messaging Properties Page

What You Can Do from the Salesforce Cloud Trigger Outbound Messaging Properties Page

You can configure the trigger outbound messaging WSDL for the Salesforce Cloud adapter.

This process consists of several steps:

- The outbound message consists of a workflow, approval, or milestone action that sends your specified information to your specified endpoint. You configure outbound messaging in the Salesforce setup menu. Afterward, you configure the endpoint.

To create a workflow rule:

1. Log in to your Salesforce account and go to Setup.
2. Under the App Setup menu, expand Create, followed by Workflow & Approvals.
3. Select a workflow rule or approval process as per your integration requirement.
4. Click Create New, provide the required information in the following wizards, and click Save.
   a. For the workflow rule, click Edit under the Workflow Action menu followed by Add Workflow Action, and then New Outbound Message.
b. For the approval process, click **Add New** (you can select for one or more actions including **Submission**, **Approval**, **Rejection**, and **Recall**) followed by **New Outbound Message**.

Outbound messaging WSDLs associated with approval processes or entitlement processes are also supported and consumed by the adapter.

- Generate the Salesforce outbound messaging WSDL at [www.salesforce.com](http://www.salesforce.com), then select the invoke outbound messaging WSDL you created to receive outbound message notifications from the Salesforce application. For instructions, see **What You See on the Salesforce Cloud Trigger Outbound Messaging Properties**.

### What You See on the Salesforce Cloud Trigger Outbound Messaging Properties

The following table describes the key information on the trigger Outbound Messaging page.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
</table>
| Select the Outbound Messaging WSDL | Generate and then select the invoke Salesforce outbound messaging WSDL to receive outbound message notifications from the Salesforce application.  
**Note**: You must first create a workflow rule as described in [What You Can Do from the Salesforce Cloud Trigger Outbound Messaging Properties Page](#). Outbound messaging WSDLs associated with approval processes or entitlement processes are also supported and consumed by the adapter. To generate and then select the invoke Salesforce outbound messaging WSDL:  
1. Log in to your Salesforce account and go to **Setup > Outbound Messages**.  
2. Select the required object, and click **Next**.  
3. Enter other required details (in the **Endpoint URL** field, enter a dummy URL), and click **Save**.  
4. Click **Generate WSDL** to download the WSDL.  
5. Return to this wizard page and browse for the generated WSDL.  
6. Activate the integration and copy the endpoint URL from the integration information icon.  
7. Go to the **Outbound Messaging** section at [www.salesforce.com](http://www.salesforce.com) and replace the dummy URL you entered in Step 3 with the real endpoint URL. |

---

### Configuring Salesforce Trigger Response Properties

Enter the Salesforce trigger response values for your integration.
**Topics**

- What You Can Do from the Salesforce Trigger Response Page
- What You See on the Salesforce Cloud Trigger Response Page

**What You Can Do from the Salesforce Trigger Response Page**

You can configure the response parameters for the Salesforce Adapter.

You can select the type of callback response to send as a response document from the integration flow to the Salesforce Cloud application.

- Configure to send no callback response.
- Configure the operation and business objects to use for a successful callback response.
- Configure the operation and business objects for a callback response for a failed integration flow.

**What You See on the Salesforce Cloud Trigger Response Page**

The following table describes the key information on the trigger Response page.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Send a response</td>
<td>Deselect if no callback response is required.</td>
</tr>
<tr>
<td>Configuration a Successful Callback Response</td>
<td>Select <strong>Configure</strong> to configure the operation and business objects to use for a successful callback response.</td>
</tr>
<tr>
<td>Configuration a Failure Callback Response</td>
<td>Select <strong>Configure</strong> to configure the operation and business objects for a callback response for a failed integration flow. The option to configure a failure callback response gets enabled only after the configuration of successful callback response.</td>
</tr>
<tr>
<td>Edit</td>
<td>Click to edit the operation or business objects of a successful or failed callback response. This button is displayed after you configure a successful callback response, a failed callback response, or both.</td>
</tr>
<tr>
<td>Header</td>
<td>Click to configure the header properties for the selected operation. The headers available for configuration are based on the type of operation you selected. This button is displayed after you configure a successful callback response, a failed callback response, or both.</td>
</tr>
</tbody>
</table>
Configuring Salesforce Trigger Callback Response Properties

Enter the Salesforce trigger callback response values for your integration.

Topics

- What You Can Do from the Salesforce Trigger Callback Response Page
- What You See on the Salesforce Cloud Trigger Callback Response Page

What You Can Do from the Salesforce Trigger Callback Response Page

You can configure the callback response parameters for the Salesforce Adapter.

- Configure the operation and business objects to use for a successful callback response.
- Configure the operation and business objects for a callback response for a failed integration flow.

What You See on the Salesforce Cloud Trigger Callback Response Page

The following table describes the key information on the trigger Callback Response page.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select an Operation Type</td>
<td>Select the type of operation to perform on the business objects in a Salesforce Cloud application:</td>
</tr>
<tr>
<td></td>
<td>• <strong>CORE:</strong></td>
</tr>
<tr>
<td></td>
<td>Displays the following selections: ConvertLead, Merge, Undelete, or Upsert.</td>
</tr>
<tr>
<td></td>
<td>• <strong>CRUD:</strong> Represents the create, read, update, delete, or destroy operations to perform on Salesforce Cloud business objects. Each letter maps to a standard SQL statement, HTTP method, or DDS operation. Select the CRUD operation to perform on the business object: Create, Delete, or Update.</td>
</tr>
<tr>
<td></td>
<td>• <strong>MISC:</strong> Represents the set of specialized task operations to perform in the Salesforce Cloud application.</td>
</tr>
</tbody>
</table>
### Filter by object name

Enter the initial letters of an object name to display a range of objects. You can also enter an asterisk (*) after the query in the search field (for example, to search for all objects starting with Acc, enter Acc*). You can also select a filter type:

- **All**: Displays all objects.
- **Custom**: Displays objects you created.
  The naming convention is a combination of the object name appended with _c.
- **Standard**: Displays business objects delivered as part of the Salesforce Cloud application.

### Select Business Objects (Salesforce API version)

Select a single business object or multiple business objects from the Salesforce Cloud application. The selected operation acts upon these business objects.

When you complete invoke operation configuration, the selected operation and business objects are defined in the integration-centric WSDL file.

### Your Selected Business Objects

Displays the business objects you selected.

---

**Configuring Salesforce Invoke Basic Information Properties**

You can enter a name and description and select the type of WSDL to use on the Salesforce invoke Basic Info page.

**Topics**

- [What You Can Do from the Salesforce Cloud Invoke Basic Info Page](#)
- [What You See on the Salesforce Cloud Invoke Basic Info Page](#)

**What You Can Do from the Salesforce Cloud Invoke Basic Info Page**

You can specify the following values on the Salesforce Cloud target Basic Info page. The Salesforce Cloud invoke Basic Info page is the initial wizard page that is displayed whenever you drag an adapter to the invoke area.

- Specify a meaningful name.
- Specify a description of the connection responsibilities.
- Select to use a standard application delivered by salesforce.com (enterprise WSDL) or custom application built using Apex classes and hosted on force.com (custom WSDL).
## What You See on the Salesforce Cloud Invoke Basic Info Page

The following table describes the key information on the Salesforce Cloud invoke Basic Info page.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
</table>
| What do you want to call your endpoint?      | Provide a meaningful name so that others can understand the connection. For example, if you are creating an invoke Salesforce Cloud connection, you may want to name it SalesforceOutboundDirection. You can include English alphabetic characters, numbers, underscores, and dashes in the name. You cannot include the following:  
  • Blank spaces (for example, My Salesforce Connection)  
  • Special characters (for example, #;836 or righ(t)now4)  
  • Multibyte characters                                                                                                                                                                           |
| What does this endpoint do?                  | Enter an optional description of the connection’s responsibilities. For example: This connection receives an outbound request to synchronize account information with the Salesforce Cloud Application.                        |
| Select outbound support option               | Select the type of WSDL to use.  
  • **Standard applications delivered by Salesforce.com:** Select this option if you want to use the enterprise WSDL that you specified in the Connection Properties dialog during adapter configuration. If you select this option, you are taken to the Operations page to select an operation type and business object to use.  
  • **Custom applications built using Apex Classes and hosted on force.com:** Select this option if you want to use a custom WSDL that includes custom Apex classes written on force.com and exposed as SOAP web services. This enables external applications to access your code and application. If you select this option, you are taken to the Custom Operations page. For more information about custom WSDLs, see [Exposing Apex Methods as SOAP Web Services](#). |
Topics

- What You Can Do from the Salesforce Target Operations Page
- What You See on the Salesforce Target Operation Page

What You Can Do from the Salesforce Cloud Invoke Operations Page
You can configure the following invoke operations values for Salesforce Cloud.

- Select either of the following operation types:
  1. CRUD
  2. Salesforce Object Query Language (SOQL) or Salesforce Object Search Language (SOSL) query

- Select the business objects.
- Specify the SOQL/SOSL query.

What You See on the Salesforce Invoke Operations Page
The following table describes the key information on the Salesforce Cloud invoke Operations page.
<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select an Operation Type</td>
<td>Select the type of operation to perform:</td>
</tr>
<tr>
<td></td>
<td>• <strong>CORE</strong>: Represents all core operations supported by the Salesforce application.</td>
</tr>
<tr>
<td></td>
<td>• <strong>CRUD</strong>: Represents the create, read, update, delete, or destroy operation to perform on Salesforce business objects. Each letter maps to a standard SQL statement, HTTP method, or DDS operation. Select the CRUD operation to perform: <em>Create</em>, <em>Delete</em>, <em>Retrieve</em>, or <em>Update</em>.</td>
</tr>
<tr>
<td></td>
<td>• <strong>MISC</strong>: Represents specialized task operations (such as fetching user information associated with the current session) in the Salesforce application.</td>
</tr>
<tr>
<td></td>
<td>• <strong>SOSL/SOQL</strong>: Select to enter a Salesforce Object Query Language (SOQL) or Salesforce Object Search Language (SOSL) query to send as a request to the Salesforce application. The following operations are available:</td>
</tr>
<tr>
<td></td>
<td>- <strong>query</strong>: Executes a query against specific criteria and returns data matching that criteria. Only records not deleted from your Salesforce application account are returned.</td>
</tr>
<tr>
<td></td>
<td>- <strong>queryAll</strong>: Returns the same data as the <em>query</em> operation, along with deleted records present in the recycle bin.</td>
</tr>
<tr>
<td></td>
<td>- <strong>search</strong>: Returns records from the Salesforce application. You can specify binding parameters to dynamically provide a search string as input to your search operation.</td>
</tr>
<tr>
<td></td>
<td>If you select this option, the page is refreshed to display a field for entering an SOQL or SOSL query to send for validation:</td>
</tr>
<tr>
<td></td>
<td>- <strong>Query Statement</strong>: Enter a valid query statement. SOQL statements evaluate to a list of sObjects, a single sObject, or an integer for <em>count</em> method queries. The following examples are provided:</td>
</tr>
<tr>
<td></td>
<td>“SELECT Id FROM Contact WHERE Name LIKE 'A%' AND MailingCity = 'California'”</td>
</tr>
<tr>
<td></td>
<td>SELECT COUNT(*) FROM Contact</td>
</tr>
<tr>
<td></td>
<td>SOSL statements evaluate to a list of sObjects, where each list contains the search results for a particular sObject type. For example,</td>
</tr>
<tr>
<td></td>
<td>“SELECT a.name, a.id, a.accountNumber, c.name from Contact c, c.Account”</td>
</tr>
<tr>
<td></td>
<td>- <strong>Binding Parameters</strong>: Displays any parameters included in the query. For example, <em>orgId</em> is a parameter in the following query:</td>
</tr>
<tr>
<td></td>
<td>SELECT a.name, a.id, a.accountNumber, c.name from Contact c, c.Account WHERE a.name = &quot;$orgId&quot;</td>
</tr>
<tr>
<td></td>
<td>This query displays a binding parameters text box in which to enter a test value for <em>orgId</em>.</td>
</tr>
<tr>
<td></td>
<td>- <strong>Test My Query</strong>: Click to validate the query against the Salesforce application. Query results are displayed. If errors occur, you receive results about how to correct the query.</td>
</tr>
</tbody>
</table>
Configuring Salesforce Invoke Header Properties

Enter the Salesforce invoke header values for your integration.

Topics

- What You Can Do from the Salesforce Target Headers Page
- What You See on the Salesforce Target Headers Page

What You Can Do from the Salesforce Cloud Invoke Headers Page

You can configure the invoke header properties for Salesforce Cloud.

What You See on the Salesforce Invoke Headers Page

The following table describes the key information on the Salesforce Cloud invoke Headers page.

The headers available for configuration are based on the operation you selected on the invoke Operations page. There are two types of headers:

- Request headers are sent with the request message to the Salesforce application.
- Response headers are received with the response message sent from the Salesforce application.

For more information about these header properties, visit www.salesforce.com and specify the specific name of the property in the search utility.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AllOrNoneHeader</strong> (request header)</td>
<td>Specifies the transactional behavior for Salesforce application operations. If you set <strong>AllOrNone</strong> to true, the call to the Salesforce application is committed only if it completes without any errors. Otherwise, it is rolled back. The default behavior is to commit partial records without any error.</td>
</tr>
<tr>
<td>Element</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>AllowFieldTruncationHeader</td>
<td>Specifies the truncation behavior for the following fields (each are string data types):</td>
</tr>
<tr>
<td>(request header)</td>
<td>• anyType</td>
</tr>
<tr>
<td></td>
<td>• email</td>
</tr>
<tr>
<td></td>
<td>• picklist</td>
</tr>
<tr>
<td></td>
<td>• encryptedstring</td>
</tr>
<tr>
<td></td>
<td>• textarea</td>
</tr>
<tr>
<td></td>
<td>• mutlipicklist</td>
</tr>
<tr>
<td></td>
<td>• phone</td>
</tr>
<tr>
<td></td>
<td>• string</td>
</tr>
<tr>
<td></td>
<td>Set <strong>allowFieldTruncation</strong> to one of the following values:</td>
</tr>
<tr>
<td></td>
<td>• <strong>True</strong>: If you enter a value of 25 characters in a field of 20 characters, the first 20 records are inserted into the field and the transaction is successful.</td>
</tr>
<tr>
<td></td>
<td>• <strong>False</strong>: If you enter a value of 25 characters in a field of 20 characters, an error is thrown and the transaction does not commit.</td>
</tr>
<tr>
<td>AssignmentRuleHeader</td>
<td>Specifies the assignment rule to use when creating or updating an account, case, or lead. The assignment rule can be active or inactive. The ID is retrieved by querying the AssignmentRule object. If the ID is specified, you do not need to specify the useDefaultRule value.</td>
</tr>
<tr>
<td>(request header)</td>
<td>• <strong>assignmentRuleId</strong>: The ID of the assignment rule to use. The ID is not validated by the Salesforce Cloud application, whether or not it exists. Validation occurs during runtime.</td>
</tr>
<tr>
<td></td>
<td>• <strong>useDefaultRule</strong>: If set to <strong>true</strong>, the default (active) assignment rule is used. If set to <strong>false</strong>, the default (active) assignment rule is not used.</td>
</tr>
<tr>
<td>Element</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>EmailHeader</strong> (request header)</td>
<td>Specifies whether or not to send a notification email. You can set the following properties:</td>
</tr>
<tr>
<td></td>
<td>• <strong>triggerAutoResponseEmail</strong></td>
</tr>
<tr>
<td></td>
<td>- <strong>true</strong>: Triggers automatic response rules for leads and cases.</td>
</tr>
<tr>
<td></td>
<td>- <strong>false</strong>: Automatic response rules for leads and cases are not triggered.</td>
</tr>
<tr>
<td></td>
<td>• <strong>triggerOtherEmail</strong></td>
</tr>
<tr>
<td></td>
<td>- <strong>true</strong>: The email is triggered outside the organization.</td>
</tr>
<tr>
<td></td>
<td>- <strong>false</strong>: The email is not triggered outside the organization.</td>
</tr>
<tr>
<td></td>
<td>• <strong>triggerUserEmail</strong></td>
</tr>
<tr>
<td></td>
<td>- <strong>true</strong>: The email is triggered and sent to users in the organization. This email is triggered by a number of events such as adding comments to a case or updating a task.</td>
</tr>
<tr>
<td></td>
<td>- <strong>false</strong>: The email is not triggered and sent to users in the organization.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>DebuggingHeader</strong> (request header)</th>
<th>Specify the debugging log level. The following log levels are supported:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• <strong>NONE</strong> (least verbose)</td>
</tr>
<tr>
<td></td>
<td>• <strong>DEBUGONLY</strong></td>
</tr>
<tr>
<td></td>
<td>• <strong>DB</strong></td>
</tr>
<tr>
<td></td>
<td>• <strong>PROFILING</strong></td>
</tr>
<tr>
<td></td>
<td>• <strong>CALLOUT</strong></td>
</tr>
<tr>
<td></td>
<td>• <strong>DETAIL</strong> (most verbose)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>MruHeader</strong> (request header)</th>
<th>The Salesforce application shows the most recently used (MRU) items. In API version 7.0 or later, the list is not updated by itself. Use <strong>MruHeader</strong> to update the list. Using this header can negatively impact performance. Set <strong>updateMru</strong> to one of the following values:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• <strong>true</strong>: The list of MRU items is updated in the Salesforce application.</td>
</tr>
<tr>
<td></td>
<td>• <strong>false</strong>: The list of most recently used items is not updated in the Salesforce application.</td>
</tr>
</tbody>
</table>

| **PackageVersionHeader** (request header) | Specifies the package version for any installed package. The package version identifies the components in a package. The package version follows the format **majorNumber.minorNumber.patchNumber** (for example, 3.4.5, where 3 refers to **majorNumber**, 4 refers to **minorNumber**, and 5 refers to **patchNumber**). |


<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>QueryOptions (request header)</td>
<td>Specifies the batch size for queries. The default value is 500, the minimum value is 200, and the maximum value is 2000.</td>
</tr>
<tr>
<td>DebuggingInfo (response header)</td>
<td>This information is only returned if the debugLevel request header is sent with the request payload to the Salesforce application.</td>
</tr>
<tr>
<td>LimitInfoHeader (response header)</td>
<td>Provides information about the limitations of API calls on a per-day basis for the organization.</td>
</tr>
<tr>
<td>• current:</td>
<td>The number of calls already used in the organization.</td>
</tr>
<tr>
<td>• Limit:</td>
<td>The organization’s limit for the specified limit type.</td>
</tr>
<tr>
<td>• Type:</td>
<td>The limit information type specified in the header API REQUESTS (contains limit information about API calls for the organization).</td>
</tr>
</tbody>
</table>

**Configuring Salesforce Invoke Custom Operations Properties**

Specify the following values on the Salesforce invoke Custom Operations page.

**Topics**

- What You Can Do from the Salesforce Cloud Invoke Custom Operations Page
- What You See on the Salesforce Cloud Invoke Custom Operations Page

**What You Can Do from the Salesforce Cloud Invoke Custom Operations Page**

You can specify the following values on the Salesforce Cloud invoke Custom Operations page.

- Select the custom WSDL.
- Select the operations to perform.
- Optionally select a new custom WSDL to use.

**What You See on the Salesforce Cloud Invoke Custom Operations Page**

The following table describes the key information on the Salesforce Cloud invoke Custom Operations page.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select the Custom WSDL</td>
<td>Select the custom WSDL to use.</td>
</tr>
</tbody>
</table>
Performing Salesforce Postconfiguration Tasks

After activating your integration, you must update the outbound message for the Salesforce adapter to send messages to Oracle Integration Cloud Service. This section describes how to activate a workflow rule.

1. Open the Salesforce application.
2. Scroll down and click Workflow Rules.
3. In the Workflow Rules panel, click the workflow rule.
4. Scroll down to the Immediate Workflow Actions section and click the outbound message.
5. In the Outbound Message panel, click Edit.
6. In the Edit Outbound Message panel, enter the endpoint URL from the Integration Details icon for the integration.
7. In the Edit Outbound Message panel, click Save.
   The Outbound Message panel is displayed.
8. In the Outbound Message panel, scroll down and find the Workflow Rules Using This Outbound Message section.
9. Click the workflow link.
   The Workflow Rule panel is displayed.
10. In the Workflow Rule panel, click Activate.

Your workflow is activated. The Salesforce application starts sending messages to the integration endpoint URL created when you activated the integration.

Configuring Trigger Integration Cloud Service Messaging

Configure trigger Integration Cloud Service Messaging for your integration. This dialog is displayed when you add Integration Cloud Service Messaging as a trigger to an integration.
Topics

- What You Can Do from the Trigger Oracle Integration Cloud Service Messaging Page
- What You See on the Trigger Oracle Integration Cloud Service Messaging Page

For more information, see Integration Cloud Service Messaging, Creating an Integration to Publish Messages to Integration Cloud Service, and Creating an Integration to Subscribe to Integration Cloud Service.

What You Can Do from the Trigger Oracle Integration Cloud Service Messaging Page

You can configure the trigger Oracle Integration Cloud Service Messaging. This enables you to subscribe to messages from Integration Cloud Service. Message subscription is accomplished through use of Integration Cloud Service Messaging.

Select the published integration to which to subscribe.

What You See on the Trigger Oracle Integration Cloud Service Messaging Page

The following table describes the key information on the trigger Integration Cloud Service Messaging page.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
</table>
| Select a Publisher | Select the published integration to which to subscribe. You must have already created a publisher to which to subscribe. The publisher does not need to be active, but must already be completely configured. After selecting a published integration, you perform the following tasks:  
  - Add an invoke adapter to the integration to subscribe to the published integration.  
  - Perform source-to-target mapping between the published integration and the invoke adapter.  
  - Optionally configure source enrichments between the published integration and the invoke adapter. |

Reviewing Configuration Values on the Summary Page

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

Topics

- What You Can Do from the Summary Page
- What You See on the Summary Page

What You Can Do from the Summary Page

You can review configuration details from the Summary page. The Summary page is the final wizard page for each adapter after you have completed your configuration.

- View the configuration details you defined for the adapter. For example, if you have defined an inbound trigger (source) adapter with a request business object
and immediate response business object, specific details about this configuration are displayed on the Summary page.

- Click **Done** if you want to save your configuration details.
- Click a specific tab in the left panel or click **Back** to access a specific page to update your configuration definitions.
- Click **Cancel** to cancel your configuration details.

**What You See on the Summary Page**

The following table describes the key information on the Summary page.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary</td>
<td>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 <strong>Back</strong>.</td>
</tr>
</tbody>
</table>
Reviewing Configuration Values on the Summary Page
Using On-Premises Integration Cloud Service

When you subscribe to Oracle Integration Cloud Service, you also have the option to install an on-premises version of Oracle Integration Cloud Service in your local environment. This enables you to use on-premises Oracle Integration Cloud Service as a proxy server that sits between your internal company server hidden behind a firewall and the cloud version of Oracle Integration Cloud Service. After installation, you can create users and assign roles to these users on the Users page of on-premises Oracle Integration Cloud Service.

Topics

• Downloading and Running the On-Premises Oracle Integration Cloud Service Installer

• Managing Users and Roles

Downloading and Running the On-Premises Oracle Integration Cloud Service Installer

You must download an execution agent installer from the Agent Groups page of Oracle Integration Cloud Service to your on-premises host and run the installer to install on-premises Oracle Integration Cloud Service.

Restrictions

The File Adapter is not supported with on-premises Oracle Integration Cloud Service. When creating a connection, do not select this adapter in the Create Connection - Select Adapter dialog.

Note: For Oracle CPQ Cloud Adapter to work, you must open up a port for external clients to call the services hosted on on-premises Oracle Integration Cloud Service.

System Requirements

Ensure that you satisfy the following prerequisites on your on-premises host before installing on-premises Oracle Integration Cloud Service:

• Operating system: Oracle Enterprise Linux 6 UC4 or above

• CPUs: 2

• Physical memory: 8 GB
• Hard disk space: 100 GB

• Database:
  – Oracle Database (XE or Standard). If you select this database option during installation, you are prompted to provide specific Oracle Database details, which are described below.

• Hostname on which to perform the installation must be entered in the `/etc/hosts` file. Without this entry, you receive an error during installation.

• User performing the installation must be a member of the `sudoers` file. If the user is not, the chef client portion of the on-premises Oracle Integration Cloud Service installation fails.

• The chef client must not already be installed on the host and must not be manually installed.

**Note:** If you previously installed and used on-premises Oracle Integration Cloud Service, you must export your integrations and lookups and import them into Oracle Integration Cloud Service 16.2.1 after completing installation.

**Downloading and Running the On-Premises Oracle Integration Cloud Service Installer**

This is the first upgrade to on-premises Oracle Integration Cloud Service since release 16.1.1. If you previously installed on-premises Oracle Integration Cloud Service, you must perform the following steps:

• Stop the Oracle WebLogic Server before installing the 16.2.1 execution agent from the `agenthome/userprojects/domains/agent-domain/bin` directory.

  `.stopWebLogic.sh`

• Specify a new directory location during installation. The 16.2.1 installation must be done in a new location and not over the previous installation.

To download and run the on-premises Oracle Integration Cloud Service installer.

**Note:** The user installing the execution agent must be configured for `sudo` access to run the `rpm` command.

1. Log in to the instance of Oracle Integration Cloud Service to which you are subscribed.
2. In the Integration Cloud Service toolbar, click **Designer**.
3. On the Designer Portal, click **Agents**.
   The Agent Groups page is displayed.
4. Click **Download Agent Installer**.
5. Select **Execution Agent**. The execution agent is used for on-premise installations of Oracle Integration Cloud Service.
6. Select **Save File** when prompted to save the ZIP file to a directory location on your on-premises host.

7. Unzip the ZIP file. The **ics-executionagent-installer.bsx** execution agent file is included in the ZIP file.

8. Change the file permissions of the **ics-executionagent-installer.bsx** file to be executable.
   
   ```bash
   chmod 755 ics-executionagent-installer.bsx
   ```

9. Execute the installer.
   
   ```bash
   ./ics-executionagent-installer.bsx
   ```

   This starts the authentication part of the installation. During authentication, you are prompted to specify configuration details.

10. Enter the following authentication information when prompted:

<table>
<thead>
<tr>
<th>When Prompted With the Following...</th>
<th>Enter...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enter your ICS subscription URL for authentication</td>
<td>Enter the URL for the Oracle Integration Cloud Service instance to which you are subscribed. For example:</td>
</tr>
<tr>
<td></td>
<td><code>https://podserver.us.oracle.com:7002/ics</code></td>
</tr>
<tr>
<td></td>
<td>Ensure that you specify the correct URL. During installation, files are downloaded from this host instance. Specifying an incorrect URL causes authentication to fail.</td>
</tr>
<tr>
<td>Enter ICS subscription Username</td>
<td>Enter the user name for the Oracle Integration Cloud Service instance to which you are subscribed. For example:</td>
</tr>
<tr>
<td></td>
<td><code>weblogic</code></td>
</tr>
<tr>
<td>Enter ICS subscription Password</td>
<td>Enter the password for the user name of the Oracle Integration Cloud Service instance to which you are subscribed.</td>
</tr>
<tr>
<td>Enter HTTPS Proxy Server Host Name</td>
<td>If you have a proxy server configured in your local environment, enter the server URL. For example:</td>
</tr>
<tr>
<td></td>
<td><code>www-myproxy.us.mycompany.com</code></td>
</tr>
<tr>
<td></td>
<td>If you do not have a proxy server, press <code>Enter</code> without entering a value to bypass this step.</td>
</tr>
<tr>
<td>Enter HTTPS Proxy Server Port Number</td>
<td>If you have a proxy server configured in your host environment, enter the port value. For example:</td>
</tr>
<tr>
<td></td>
<td><code>80</code></td>
</tr>
<tr>
<td></td>
<td>If you do not have a proxy server, press <code>Enter</code> without entering a value to bypass this step.</td>
</tr>
</tbody>
</table>

If the information you enter is correct, the following message is displayed.

*Authentication Successful. Starting ICS On Premise Install!!*
If authentication was not successful, review the log file in the directory path shown on-screen to identify which information was incorrect.

11. Enter the following installation information when prompted:

<table>
<thead>
<tr>
<th>When Prompted With the Following...</th>
<th>Enter...</th>
</tr>
</thead>
<tbody>
<tr>
<td>What Do You Want to call this Execution Agent?</td>
<td>Enter a name that you want to use for the agent ID. Ensure that you specify the correct value. Specifying an incorrect value causes installation to fail.</td>
</tr>
<tr>
<td>Press enter to accept the default path or enter a new install path</td>
<td>Accept the default path or enter a different directory location in which to install the on-premises Oracle Integration Cloud Server. If you enter a different directory path, it must already exist.</td>
</tr>
<tr>
<td>Enter the user name (cannot be root) to be used for install</td>
<td>Enter the UNIX user name to use for performing this installation. For example: builder</td>
</tr>
<tr>
<td>Enter the group (groups &lt;user&gt; will list the groups of a user) of the user to be used for install</td>
<td>Enter the group of the user who is performing this installation. For example: dba</td>
</tr>
<tr>
<td>Press enter to accept the default value or enter a new port number</td>
<td>Press Enter to accept the default non-SSL port value. Do not enter a new value. By default, the following message is displayed. Default HTTP Port for ICS Execution Agent: 7001</td>
</tr>
<tr>
<td>Press enter to accept the default value or enter a new port number</td>
<td>Press Enter to accept the default SSL port value. Do not enter a new value. By default, the following message is displayed. Default HTTPS Port for ICS Execution Agent: 7002</td>
</tr>
<tr>
<td>Enter the password for the default user weblogic</td>
<td>Enter the password for the weblogic user. After installation, you use this user name and password combination to log in to Integration Cloud Service for the first time to create additional users and assign roles to those users under the Users tab.</td>
</tr>
</tbody>
</table>

12. Provide the following information for the Oracle Database:

<table>
<thead>
<tr>
<th>When Prompted With the Following...</th>
<th>Enter...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database host name</td>
<td>Enter the host name for the server on which the Oracle Database is installed.</td>
</tr>
<tr>
<td>Database Port</td>
<td>Enter the port number of the host.</td>
</tr>
</tbody>
</table>
When Prompted With the Following... Enter...

| **Database user name with the SYSDBA role** | Enter the database user name. This user is used by the Repository Creation Utility (RCU) to create the necessary schemas. |
| **Database user password** | Enter the password for the database user name. |
| **Password for on-premises Integration Cloud Service schemas** | Enter the password for the on-premises Oracle Integration Cloud Service schemas created by the RCU. |
| **Database SID/service name** | Enter the database system identifier (SID)/service name. |

The installer connects to the Oracle Integration Cloud Server instance you specified during the authentication part of installation to verify installation details, identify heartbeat information, download files, and install components, including Oracle WebLogic Server and Oracle Integration Cloud Service. Messages are displayed on-screen.

If installation is not successful, review the log file in the directory path shown on-screen to identify the issue.

If installation completes successfully, the following message is displayed. The installation log file location is also displayed.

**Chef Client finished**

The on-premises installation submits a heartbeat message to the cloud version of Oracle Integration Cloud Service every five minutes to indicate that the on-premises installation is running.

13. Log in to on-premises Oracle Integration Cloud Service with the Oracle Integration Cloud Service subscription username and password you entered in Step 10 of the installation process.

   Note that there is a Users tab on the home page for creating users and assigning roles to these users. For more information, see Creating Users and Assigning Roles. Unlike the cloud version of Oracle Integration Cloud Service, there is no Agents box for managing agents on the home page. Those management tasks are not required in on-premises Oracle Integration Cloud Service.

14. Log in to the cloud version of the Oracle Integration Cloud Service that you specified during the authentication part of installation. This is the host from which you downloaded the execution agent at the beginning of these instructions.

15. Click Agents.

16. Note that Execution Agent Group is displayed. The number of agents is 1 to identify the on-premises installation of Oracle Integration Cloud Service.
17. Click the number above **Number of Agents** to display the agent ID that you specified during installation. This is the agent ID of your on-premises installation.

18. Click **Monitor**, then click **Agents** to also see details about agent health based on the heartbeat.

**Troubleshooting Execution Agent Installation**

If the following error is displayed when reading any binary files or unzipping files during execution agent installation, you must remove the *ics_generic.zip* file from the `ICSOPInstall\tmp` directory and restart the installation.

```
Error executing action 'run' on resource 'execute[Unzipping /<PATH>/ics_generic.zip to: /<PATH>/ICSOPInstall/tmp]'`  
```

**Managing Users and Roles**

You can create new users and assign roles to these users on the Users page of on-premises Oracle Integration Cloud Service. You can also edit information assigned to users (such as roles and passwords) and delete users.

**Topics**

- Creating Users and Assigning Roles
- Editing On-Premises Users
- Deleting On-Premises Users

**Creating Users and Assigning Roles**

On-premises Oracle Integration Cloud Service provides a Users page on which you can create users and assign roles to these users. You can also update the roles, password, and other information assigned to existing users. The Users page is only available with on-premises Oracle Integration Cloud Service.

The Users page is only accessible to administrative users of on-premises Oracle Integration Cloud Service. The weblogic user for which you provided a password during installation can be used to create users on the Users page. If you create an additional user with the IntegrationServiceAdmin role, they also have access to the Users page.

**Creating New Users and Assigning Roles to New Users**

1. On the Oracle Integration Cloud Service home page, click **Users**.
   
   The Users page is displayed.

2. Click **Create New User**.

3. Enter the following information, and click **Create**.
<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
</table>
| User Name | Provide a meaningful name so that others can understand the user name. The name must be unique among all user names in the system. The name can consist of the following:  
• Letters (A-Z, a-z)  
• Numbers (0-9)  
• Spaces ( )  
• Special characters ( _ - )  
The name must not begin or end with a space and cannot be longer than 50 characters. |
<p>| Password  | Enter a password for the user. |
| Confirm   | Enter the same password a second time. |
| Password  | |
| First Name| Enter the first name of the user. |
| Last Name | Enter the last name of the user. |
| Email Address | Enter the email address of the users. When you complete creation of this user, they receive an email with login details. |
| Description | Provide a meaningful description of the responsibilities of the user. |</p>
<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
</table>
| Available Roles    | • **IntegrationServiceDeveloper**: Enables you to access Integration Cloud Service to create, deploy, and monitor integrations. You can access all parts of Oracle Integration Cloud Service with this role.  
• **IntegrationServiceMonitor**: Enables you to access Integration Cloud Service to monitor integrations. Only the monitoring dashboard is available with this user role. If you click the Integrations, Connections, Lookups, Packages, or Agents icons on the home page, you receive a User is not authorized to perform this action message.  
• **IntegrationServiceRuntime**: Enables you to access runtime services. This role is assigned to a user and uses SOAP/REST to communicate with services at runtime. This role only has privileges to execute a flow. You can pass the username/password with this role to invoke SOAP/REST APIs. A user with this role can log in, but cannot perform any action and receives a User is not authorized to perform this action message on the home page.  
• **IntegrationServiceEMMonitor**: Used for REST API calls into Oracle Integration Cloud Service. This is an infrastructure role that an on-premises Oracle Integration Cloud Service user does not need to be assigned.  
• **IntegrationServiceAdmin**: Enables you to access Integration Cloud Service to create, deploy, and monitor integrations. You can access all parts of Oracle Integration Cloud Service, including the Users tab for managing users.  
• **IntegrationServiceMarketplace**: Enables you to access the Oracle Marketplace link in the upper right corner to import marketplace integrations into Oracle Integration Cloud Service.                                                                                                                                 |
| Selected Roles     | Displays the roles assigned to the user.                                                                                                                                                                                                                                                                                                     |
4. Select the roles to add or remove from this user. Descriptions of available roles are provided in the previous steps.

5. Click OK.

---

**Note:** If you log in with the administrator account (for example, weblogic) and remove all roles from an existing user (for example, named ics_myaccount), then log in immediately with ics_myaccount, note that this user still retains all their roles, even though you had removed them. This is because there is a time delay of 20 to 60 seconds only when all roles of a user are granted or revoked. This time delay does not occur when granting or revoking several roles.

---

### Editing On-Premises Users

You can edit the first name, last name, email address, description, and password of users in on-premises Oracle Integration Cloud Service.

**To edit on-premises users:**

1. On the Oracle Integration Cloud Service home page, click Users.
   
   The Users page is displayed.

2. To edit the first name, last name, email address, and description of a user:
   
   a. Find the user to edit.
   
   b. From the menu icon at the far right, select Edit.
   
   c. Edit the first name, last name, email address, or description of the selected user, and click OK.

   **Note:** If you delete the last name of an existing user, click OK, then re-enter this dialog, note that the user’s login name is added to this field in place of the deleted last name. This is the expected behavior.

3. To edit the password of a user:
   
   a. Find the user to edit.
   
   b. From the menu icon at the far right, select Change Password.
   
   c. Enter the new password twice, and click OK.

### Deleting On-Premises Users

You can delete users in on-premises Oracle Integration Cloud Service.

**To delete on-premises users:**

1. On the Oracle Integration Cloud Service home page, click Users.
   
   The Users page is displayed.

2. Find the user to delete.
3. From the menu icon at the far right, select **Delete**.

4. Click **Yes** when prompted to confirm.