Oracle® Cloud
Using the Oracle HCM Cloud Adapter with Oracle Integration
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Preface

This guide describes how to configure the Oracle HCM Cloud Adapter as a connection in an integration in Oracle Integration.

**Note:**

The information in this guide applies to all of your Oracle Integration instances. It doesn’t matter which edition you’re using, what features you have, or who manages your cloud environment. You’ll find what you need here, including notes about any differences between the various flavors of Oracle Integration when necessary.

**Topics**

- Audience
- Documentation Accessibility
- Related Resources
- Conventions

**Audience**

This guide is intended for developers who want to use the Oracle HCM Cloud Adapter in integrations in Oracle Integration.

**Documentation Accessibility**


**Access to Oracle Support**

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit [http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info](http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info) or visit [http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs](http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs) if you are hearing impaired.

**Related Resources**

See these Oracle resources:
- Oracle Cloud
  [http://cloud.oracle.com](http://cloud.oracle.com)
- *Using Integrations in Oracle Integration*
- *Using the Oracle Mapper with Oracle Integration*

## Conventions

The following text conventions are used in this document:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Meaning</th>
</tr>
</thead>
<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><strong>monospace</strong></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>
</tr>
</tbody>
</table>
Understand the Oracle HCM Cloud Adapter

Review the following conceptual topics to learn about the Oracle HCM Cloud Adapter and how to use it as a connection in integrations in Oracle Integration. A typical workflow of adapter and integration tasks is also provided.

Topics:
- Oracle HCM Cloud Adapter Capabilities
- Oracle HCM Cloud Adapter Restrictions
- What Application Version Is Supported?
- Workflow to Create and Add an Oracle HCM Cloud Adapter Connection to an Integration

Oracle HCM Cloud Adapter Capabilities

The Oracle HCM Cloud Adapter enables you to create an integration with Oracle Human Capital Management (HCM) Cloud applications. You select business objects that an integration receives from Oracle HCM Cloud as a request and as a response.

Note:

Only use supported SOAP services. See Business Object Services of Cloud SOAP Web Services for Oracle HCM Cloud.

The Oracle HCM Cloud Adapter enables customers to easily integrate their on-premises or SaaS applications with Oracle HCM Cloud without having to know about the specific details involved in the integration.

The Oracle HCM Cloud Adapter provides the following benefits:

- Integrates easily with the Oracle HCM Cloud application’s WSDL file to produce a simplified, integration-centric WSDL.
- Generates automatic mapping to the exposed business object that you select during adapter configuration as a trigger connection. A business object represents a self-contained business document that can be acted upon by the integration. An integration can send requests to create a new record for that business object. They can send a request either to update or delete an existing record for a business object. Integrations can also send requests to retrieve information about one or more records representing that business object.
- Exposes the Business Resource (REST) API, which represents an Oracle Fusion Applications REST API resource. You can select parent business resources and
their corresponding child business resources. Support is provided in the invoke (outbound) direction.

- Supports consumption of the Oracle HCM Cloud REST API. This enables the Oracle HCM Cloud Adapter to consume REST services under Oracle HCM Cloud when configured as an invoke connection. See All REST Endpoints of REST API for Oracle HCM Cloud for details about supported REST resources.
- Automatically handles security policy details required to connect to the Oracle HCM Cloud application.
- Provides standard error handling capabilities.
- Enables you to map business objects that have polymorphic data structures.
- Dynamically invokes a REST endpoint/URL at runtime without requiring you to configure any extra invoke connection or REST outbound details. See Invoke an Endpoint Dynamically.
- Supports subscribing to the HCM Atom feed. Atom feeds enable you to track changes made to feed-enabled resources in Oracle Global Human Resources Cloud. For any updates of interest to downstream applications such as new hires, terminations, employee transfers, and promotions, Oracle Global Human Resources Cloud publishes Atom feeds. The Oracle HCM Cloud Adapter’s Atom feed subscription feature enables you to select a feed of interest. This feature must be used in a scheduled manner because there is a need to poll for updates at regular intervals. This is done by selecting a scheduled orchestration template when creating the integration.

This feature is supported when using the Oracle HCM Cloud Adapter as an invoke connection in an integration.

Prior to HCM release 18c, future-dated Atom entries appeared in their respective Atom feed immediately once the future-dated action was taken.

Starting with HCM release 18c, there is a change in the way future-dated updates are returned by the HCM service. Atom feed entries appear by default once the future-dated actions become effective. You can select to process these future-dated Atom entries immediately on the Operations page of the Adapter Endpoint Configuration Wizard. The default behavior is to process future-dated Atom updates in the future.

See Polling of REST API for Oracle HCM Cloud.
See Atom Feeds of Cloud REST API for Oracle Global Human Resources Cloud.

- Enables you to upload files to Oracle WebCenter Content (Universal Content Manager) in encrypted or unencrypted format. Oracle WebCenter Content provides a unified repository to store unstructured content, enabling organizations to deliver the content to business users in the proper format. See Upload a File to Oracle WebCenter Content.

**Note:**

Downloading files from Oracle WebCenter Content is not supported.

- Supports HCM data extracts, a flexible tool for generating data files and reports. The Oracle HCM Cloud Adapter works as an extract discovering tool under Oracle HCM Cloud. The data extract process is automated as per the following steps:
– Invoking the given HCM data extract by the client outside the Oracle HCM Cloud Adapter.
– Discovering the extract as delivered in Oracle WebCenter Content.
– Fetching the extract output in its format as it is delivered to Oracle WebCenter Content and persisting the extract to Oracle Integration staging.
– Defining the XML schema by the user for the extract output for transformation using a stage file action that is available in an orchestrated integration.

**Note:**

The user must understand how to download the schema and how to schedule and run HCM extracts from the Oracle HCM Cloud user interface. See Defining an Extract: Worked Example of Cloud Integrating with Oracle HCM Cloud.

This feature is supported when using the Oracle HCM Cloud Adapter as an invoke connection in an integration.

### Oracle HCM Cloud Adapter Restrictions

Note the following Oracle HCM Cloud Adapter restrictions.

- The System for Cross-Domain Identity Management (SCIM) REST API under Oracle HCM Cloud is not discoverable through the Oracle Application Development Framework. Therefore, the Oracle HCM Cloud Adapter is unable to list those resources during design time. As an alternative, use the REST Adapter with the SCIM REST API under Oracle HCM Cloud.
- Downloading files from Oracle WebCenter Content is not supported.

### What Application Version Is Supported?

For information about which application version is supported by this adapter, see the Oracle Integration Adapters Certification Matrix under section Oracle Integration Adapters Certification at the top of the page:

Oracle Integration Adapters Certification Matrix

### Workflow to Create and Add an Oracle HCM Cloud Adapter Connection to an Integration

You follow a very simple workflow to create a connection with an adapter and include the connection in an integration in Oracle Integration.
<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>More Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Create the adapter connections for the applications you want to integrate.</td>
<td>Create an Oracle HCM Cloud Adapter Connection</td>
</tr>
<tr>
<td></td>
<td>The connections can be reused in multiple integrations and are typically</td>
<td></td>
</tr>
<tr>
<td></td>
<td>created by the administrator.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Create the integration. When you do this, you add trigger and</td>
<td>Create Integrations and Add the Oracle HCM Cloud</td>
</tr>
<tr>
<td></td>
<td>invoke connections to the integration.</td>
<td>Cloud Adapter Connection to an Integration</td>
</tr>
<tr>
<td>3</td>
<td>Map data between the trigger connection data structure and the invoke</td>
<td>Map Data of Using Integrations in Oracle Integration</td>
</tr>
<tr>
<td></td>
<td>connection data structure.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>(Optional) Create lookups that map the different values used by those</td>
<td>Manage Lookups of Using Integrations in Oracle</td>
</tr>
<tr>
<td></td>
<td>applications to identify the same type of object (such as gender codes or</td>
<td>Integration</td>
</tr>
<tr>
<td></td>
<td>country codes).</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Activate the integration.</td>
<td>Manage Integrations of Using Integrations in Oracle</td>
</tr>
<tr>
<td>6</td>
<td>Monitor the integration on the dashboard.</td>
<td>Monitor Integrations of Using Integrations in Oracle</td>
</tr>
<tr>
<td>7</td>
<td>Track payload fields in messages during runtime.</td>
<td>Assign Business Identifiers for Tracking Fields in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Messages and Manage Business Identifiers for Tracking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fields in Messages of Using Integrations in Oracle</td>
</tr>
<tr>
<td>8</td>
<td>Manage errors at the integration level, connection level, or specific</td>
<td>Manage Errors of Using Integrations in Oracle</td>
</tr>
<tr>
<td></td>
<td>integration instance level.</td>
<td>Integration</td>
</tr>
</tbody>
</table>
Create an Oracle HCM Cloud Adapter Connection

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

Topics:
• Prerequisites for Creating a Connection
• Create a Connection
• Upload an SSL Certificate
• Refresh Integration Metadata

Prerequisites for Creating a Connection

You must satisfy the following prerequisites to create a connection with the Oracle HCM Cloud Adapter:

• Subscribe to Oracle HCM Cloud. This action enables you to create an Oracle HCM Cloud user account with the correct privileges. You specify this user account when creating an Oracle HCM Cloud Adapter connection on the Connections page. For information about specifying these credentials on the Connections page, see Configure Connection Security. For information about subscribing, see Oracle HCM Cloud.

• Obtain the necessary Oracle HCM Cloud service catalog service WSDL URL or interface catalog URL. For information, see Specify the Oracle HCM Cloud Service Catalog Service WSDL or Service Interface URL.

• Oracle HCM Cloud Atom feeds and Oracle HCM Cloud REST APIs support is available by default in the Oracle HCM Cloud Adapter in Oracle Integration. However, for the Oracle HCM Cloud application, you must request access to Atom feeds and REST APIs capabilities on your Oracle HCM Cloud instance(s) first through the steps described in My Oracle Support Note 2060899.1. Once these are enabled in your Oracle HCM Cloud application, Atom feeds and REST APIs appear in the Oracle HCM Cloud Adapter in Oracle Integration.

Ap feeds are supported when using the Oracle HCM Cloud Adapter as an invoke connection in an integration.

• If you want to upload files to Oracle WebCenter Content, see Upload Files to Oracle WebCenter Content.
Specify the Oracle HCM Cloud Service Catalog Service WSDL or Service Interface URL

You must specify a required service catalog service WSDL (for accessing business objects) and optionally an interface catalog URL (for accessing business (REST) resources).

The following sections describe how to obtain the service catalog service WSDL and interface catalog URL:

• For Fusion Applications Releases 10 Through 12
• For Fusion Applications Releases 13 and Later

For Fusion Applications Releases 10 Through 12

Obtain the Oracle Fusion Applications Releases 10 through 12 service catalog service WSDLs and interface catalog URLs through the following methods.

• Obtain the Service Catalog Service WSDL for Releases 10 Through 11
• Obtain the Service Catalog Service WSDL for Release 12
• Obtain the Interface Catalog URL

Obtain the Service Catalog Service WSDL for Releases 10 Through 11

<table>
<thead>
<tr>
<th>WSDL Requirements</th>
<th>Where Do You Get the WSDL?</th>
</tr>
</thead>
<tbody>
<tr>
<td>The URL must be that of a service catalog service WSDL. The service catalog service is a Fusion Application service that returns a list of external services available for integration. It allows clients to retrieve information about all public Fusion Application service endpoints available for that instance. The service catalog service enables clients to retrieve information about all public Oracle Fusion Application service endpoints available for that instance. The information it returns is specific to the particular cloud instance and also reflects the new services that may have been introduced in patches applied to the instance. This service is used to programmatically discover the SOAP services available on the cloud instance and retrieve the necessary metadata to invoke the SOAP services to manage business objects.</td>
<td>The developer creating an Oracle HCM Cloud connection must work with the Oracle HCM Cloud service administrator to get the concrete WSDL URL for the service catalog service provisioned for the specific SaaS application.</td>
</tr>
</tbody>
</table>

This section describes how to derive the external virtual host and port for a tokenized service catalog service WSDL. The topology information in the Topology Registration setup task contains the external virtual host and port for the domains and applications. The following instructions describe the steps for deriving the values using the service catalog service WSDL URL as an example: https://atf_server:port/fndAppCore-Services/ServiceCatalogService.
To access the Review Topology page, the ASM_REVIEW_TOPOLOGY_HIERARCHY_PRIV entitlement must be granted to the user's job role. The entitlement is granted to the ASM_APPLICATION_DEPLOYER_DUTY duty role, which is inherited by the duty roles ASM_APPLICATION_DEVELOPER_DUTY and ASM_APPLICATION_ADMIN_DUTY.

If the menu items and tasks described in the following procedure are not available in your cloud instance, your user account is missing the required role. Contact your cloud instance security administrator for assistance.

1. Log in to the cloud instance.
2. Click the Navigator icon in the global area in the top part of the window, then chose Setup and Maintenance under the Tools heading.
3. Select Review Topology under the Topology Registration section in the Tasks regional area on the left side of the window.
4. Click the Detailed tab in the middle of the window.

The tab shows the list of domains configured in the cloud instance.

5. Map the token name for the service path value to the domain name in the Topology Manager:

<table>
<thead>
<tr>
<th>Token Name in Service Path</th>
<th>Domain Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>atf_server</td>
<td>CommonDomain</td>
</tr>
<tr>
<td>crm_server</td>
<td>CRMDomain</td>
</tr>
<tr>
<td>fin_server</td>
<td>FinancialDomain</td>
</tr>
<tr>
<td>Token Name in Service Path</td>
<td>Domain Name</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>hcm_server</td>
<td>HCMDomain</td>
</tr>
<tr>
<td>ic_server</td>
<td>ICDomain</td>
</tr>
<tr>
<td>prc_server</td>
<td>ProcurementDomain</td>
</tr>
<tr>
<td>prj_server</td>
<td>ProjectsDomain</td>
</tr>
<tr>
<td>scm_server</td>
<td>SCMDomain</td>
</tr>
</tbody>
</table>

6. Expand the domain name and select any external virtual host and port for the J2EE applications that are deployed on the domain. In the sample window, the values for this particular instance are `fs-your-cloud-hostname` and 443, respectively.

7. Replace the `domainName_server:PortNumber` with the external virtual host and port identified in the previous step. For example:

   https://fs-your-cloud-hostname:port/fndAppCoreServices/ServiceCatalog-Service?wsdl

Obtain the Service Catalog Service WSDL For Release 12

To obtain the physical endpoint of your instance, perform the following steps:

1. Log in to the Fusion Applications home page. For example:

   https://acme.fs.us2.oraclecloud.com/homePage/faces/FuseWelcome

   Where `acme` is the system name and `fs` is a Fusion Applications domain.
2. Copy https://acme.fs.us2.oraclecloud.com/ and append fndAppCoreServices/ServiceCatalogService?WSDL. For example:

   https://acme.fs.us2.oraclecloud.com/fndAppCoreServices/ServiceCatalogService?WSDL

**Obtain the Interface Catalog URL**

The interface catalog URL takes the following format:

https://fusxxxxx-fs-ext.us.oracle.com/helpPortalApi/otherResources/latest/interfaceCatalogs

For Fusion Applications Releases 13 and Later

Obtain the Oracle Fusion Applications Release 13 and later service catalog service WSDLs and interface catalog URLs through the following methods.

- Obtain the Service Catalog Service WSDL
- Obtain the Interface Catalog URL

**Obtain the Service Catalog Service WSDL**

To obtain the physical endpoint of your instance, perform the following steps:

1. Log in to the Fusion Applications home page. For example:

   https://acme.fa.us6.oraclecloud.com/fscmUI/faces/FuseWelcome

   Where acme is the system name and us6 is the data center.

2. Copy https://acme.fa.us6.oraclecloud.com/ and append it with fscmService/ServiceCatalogService?WSDL. For example:

   https://acme.fs.us2.oraclecloud.com/fscmService/ServiceCatalogService?WSDL

**Obtain the Interface Catalog URL**

The interface catalog URL takes the following format:

https://fusxxxxx-fa-ext.us.oracle.com/fscmRestApi/otherResources/latest/interfaceCatalogs

**Assign Required Roles to an Integration User**

To use the Oracle HCM Cloud Adapter in an integration, you must assign specific roles to an integration user.

**Associating the Integration User with the Following Roles and Privileges**

You associate the user with the following roles and privileges.
### Role Descriptions

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL_INTEGRATION_POINTS_ALL_DATA</td>
<td>Starting with release 12, this role is no longer supported. When existing customers upgrade to release 12, users with this role continue using it, although it is hidden from the Security Console. If you create a new integration user in release 12 or later, you cannot assign this role.</td>
</tr>
<tr>
<td>ORA_HRC_HUMAN_CAPITAL_MANAGEMENT_INTEGRATION_SPECIALIST_JOB</td>
<td>Human Capital Management Integration Specialist. The role applies to Releases 12 and 13.</td>
</tr>
<tr>
<td>AttachmentsUser</td>
<td>Provides access to the Attachments security group to download the log file or the output file with the HCM Integration Service. Starting with Release 12, this role is automatically shipped. You must verify that this role is automatically assigned to the user.</td>
</tr>
<tr>
<td>SOAOperator</td>
<td>The SOA Operator role.</td>
</tr>
<tr>
<td>FND_MANAGE_CATALOG_SERVICE_PRIV</td>
<td>Role for managing the web services catalog. For Oracle CRM Cloud implementations, you can also assign the Customer Relationship Management Application Administrator role. See Job Role: Customer Relationship Management Application Administrator of Cloud Security Reference for Oracle Sales Cloud.</td>
</tr>
</tbody>
</table>

Additional roles may be required as per each interface requirements.

See the Oracle Integration - Fusion Applications Security Requirements blog for additional details.

### Using the Security Console

Use the Security Console to manage application security such as roles, users, certificates, and administration tasks. Access to the Security Console is provided by the pre-defined Security Manager role. Access the Security Console in the following ways:

- Use the Manage Job Roles or Manage Duties tasks in the Setup and Maintenance work area.
- Select Navigator > Tools > Security Console.

![Security Console](image)
Upload Files to Oracle WebCenter Content

You must satisfy the following prerequisites to upload a file to Oracle WebCenter Content (Universal Content Manager) with the Oracle HCM Cloud Adapter.

- Create a PGP Public Key for Encrypted File Upload:
  To upload encrypted files, a PGP public key is required. You must generate the PGP public key and save it for upload. The supported algorithm for the public key is RSA for encryption and the key size must be 1024 bits in length.

  The process for uploading files into Oracle HCM Cloud is:
  - You encrypt files using the Oracle HCM Cloud public key.
  - The data-loading process decrypts files using the Oracle HCM Cloud private key.

  See subsection Generating the PGP Encryption Key Pair of Setting up Encryption for File Transfer: Procedure of Cloud Integrating with Oracle HCM Cloud.

- Configure Security and User Access
  Once you have configured security groups and doc accounts for the file to upload, you can configure the Oracle HCM Cloud Adapter to upload the file to Oracle WebCenter Content.

  See Understanding Security and User Access of Administering Oracle WebCenter Content.

Create 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 navigation pane, click Integrations, then click Connections.
2. Click Create.

   Note:
   You can also create a connection in the integration canvas of:
   - An orchestrated integration (See Define Inbound Triggers and Outbound Invokes.)
   - A basic routing integration (See Add a Trigger (Source) Connection.)

   The Create Connection — Select Adapter dialog is displayed.

3. 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 Create New Connection dialog is displayed.

4. 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, Sales Opportunity).

• 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 Service Cloud (RightNow) Adapter as only an invoke, but drag the adapter to the trigger section).

• Enter an optional description of the connection.

5. Click **Create**.

Your connection is created and you are now ready to configure connection details, such as email contact, connection properties, security policies, connection login credentials, and (for certain connections) agent group.

**Add a Contact Email**

You can add an optional contact email address for notifications.

1. In the Email Address field, enter an optional email address. You do **not** receive automatic notifications at this address.

2. In the upper right corner, click **Save**.
Configure Connection Properties

Enter connection information so your application can process requests.

1. Click **Configure Connectivity**.
   The Connection Properties dialog is displayed.

2. In the **HCM Services Catalog WSDL URL** field, specify the URL to use in this integration.

3. In the **Interface Catalog URL** field, optionally specify the URL to consume Oracle HCM Cloud REST API business resources.
   If the interface catalog URL is not specified, the **Subscribe to Updates (via ATOM Feed)** option does not appear for selection on the Actions page of the Adapter Endpoint Configuration Wizard.

4. Click **OK**.

5. Configure connection security.

Configure Connection Security

Configure security for your Oracle HCM Cloud Adapter connection by selecting the security policy and security token.

1. Click **Configure Credentials**.

2. Enter your login credentials:
   a. Select the security policy. Only the Username Password Token policy is supported. It cannot be deselected.
   b. Enter the username and password.
   c. Reenter the password a second time.

3. If you want to upload an encrypted file to Oracle WebCenter Content (Universal Content Management (UCM), select the **PGP Public Key for UCM Upload** checkbox, then click **Upload** to upload the public key to encrypt the file. The PGP public key must already be created. See **Upload Files to Oracle WebCenter Content**.

4. Click **OK**.

Test the Connection

Test your connection to ensure that it is successfully configured.

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

2. If your adapter connection uses a WSDL, you are prompted to select the type of connection testing to perform:
   - **Validate and Test**: Performs a full validation of the WSDL, including processing of the imported schemas and WSDLs. Complete validation can take several minutes depending on the number of imported schemas and WSDLs. No requests are sent to the operations exposed in the WSDL.
   - **Test**: Connects to the WSDL URL and performs a syntax check on the WSDL. No requests are sent to the operations exposed in the WSDL.
If successful, the following message is displayed and the progress indicator shows 100%.

Connection *connection_name* was tested successfully.

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

4. When complete, click **Save**, then click **Close**.

**Upload 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, an exception is thrown. In that case, you must upload the appropriate certificate. A certificate enables Oracle Integration to connect with external services. If the external endpoint requires a specific certificate, request the certificate and then upload it into Oracle Integration.

To upload an SSL certificate:

1. In the navigation pane, click **Integrations**, then click the &lt; arrow next to **Designer**.
2. Click **Settings** &gt; **Certificates**.

   All certificates currently uploaded to the trust store are displayed in the Certificates dialog. The **Filter By** &gt; **Type** list displays the following details:
   - **Preinstalled**: Displays the certificates automatically installed in Oracle Integration. 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.

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

4. In the Upload Certificate dialog box, select the certificate type. Each certificate type enables Oracle Integration to connect with external services.
   - **Trust Certificate**: Use this option to upload a trust certificate.
     a. Enter a unique alias for the certificate.
     b. Click **Browse**, then select the trust file (for example, .cer or .crt) to upload.
   - **Message Protection Certificate**: Use this option to upload a keystore certificate with SAML token support. Create, read, update, and delete (CRUD) operations are supported on this type of certificate.
     a. Enter a unique alias for the certificate.
     b. Click **Browse**, then select the certificate file (.cer or .crt) to upload.
   - **Identity Certificate**: Use this option to upload a certificate for two-way SSL communication.
     a. Click **Browse**, then select the keystore file (.jks) to upload.
     b. Enter the password of the keystore being imported.
c. Enter the comma-separated list of aliases from the keystore being imported.
d. Enter the comma-separated list of passwords corresponding to key aliases.
e. If you want to display the passwords in clear text, select Show Key Password(s). This enables you to ensure that you are correctly entering a list of keystore passwords.

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.

Refresh 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 navigation pane, click Integrations, then click Connections.
2. Locate the connection to refresh.
3. 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.
Add the Oracle HCM Cloud Adapter Connection to an Integration

When you drag the Oracle HCM Cloud Adapter into the trigger or invoke area of an integration, the Adapter Endpoint Configuration Wizard appears. This wizard guides you through the configuration of the Oracle HCM Cloud Adapter endpoint properties.

These topics describe the wizard pages that guide you through configuration of the Oracle HCM Cloud Adapter as a trigger or invoke in an integration.

Topics:

• Basic Info Page
• Trigger Request Page
• Trigger Response Page
• Invoke Action Page
• Invoke Operation Page
• Summary Page

Basic Info Page

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

<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, #;83\ 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. |
Trigger Request Page

Enter the Oracle HCM Cloud trigger request values for your integration. The values you specify start the integration.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select a Business Object</td>
<td>Select the business object from the Oracle HCM Cloud application to receive as a request that starts the integration.</td>
</tr>
<tr>
<td>Filter by object name</td>
<td>Type the initial letters of the name to filter the display of business objects.</td>
</tr>
</tbody>
</table>

Trigger Response Page

Enter the Oracle HCM Cloud trigger response values for your integration.

- Immediate (synchronous) response: A response business object is immediately returned as output. You select **Immediate** as the response type on the Response page and select the business object as part of the response to the client.
- Delayed (asynchronous) response: A callback service to which to route the callback is exposed. You select **Delayed** as the response type on the Response page and select the operation and business object that comprise a successful callback response, a failed callback response, or both.
- No response is required: You select **None** on the Response page because a response is not required.

The Response page looks as follows:
The following table describes the fields available if an immediate (synchronous) response is required.

Table 3-1  Response Type — Immediate (Synchronous) Response is Required

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Type</td>
<td>Select <strong>Immediate</strong> for the Oracle HCM Cloud application to wait until a response is received from the integration. This is also known as the request and response message exchange pattern. This is the default selection.</td>
</tr>
<tr>
<td>Filter by object name</td>
<td>Type the initial letters to filter the display of business objects.</td>
</tr>
<tr>
<td>Select a Business Object</td>
<td>Select the business object to receive from the Oracle HCM Cloud application as a response. A description of the selected business object is displayed below this list.</td>
</tr>
<tr>
<td>Name</td>
<td>Displays the name of the selected business object.</td>
</tr>
<tr>
<td>Description</td>
<td>Displays the description of the selected business object.</td>
</tr>
</tbody>
</table>

The following table describes the fields available if a delayed (asynchronous) callback response is required. You can configure a successful callback response, a failed callback response, or both.

Table 3-2  Response Type — Delayed (Asynchronous) Response is Required

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Type</td>
<td>Select <strong>Delayed</strong> to configure a successful callback response, a failed callback response, or both.</td>
</tr>
<tr>
<td>Successful Response/Failed Response</td>
<td>Select the type of callback to configure. After configuring one type of callback (for example, successful), you can configure the other type (for example, failed).</td>
</tr>
<tr>
<td></td>
<td>• <strong>Successful Response</strong>: Select to configure the operation and business objects that you want the Oracle HCM Cloud application to process as part of a successful callback response sent by the integration.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Failed Response</strong>: Select to configure the operation and business objects that you want the Oracle HCM Cloud application to process as part of a failed callback response sent by the integration.</td>
</tr>
<tr>
<td>Select the operation to perform on the business object</td>
<td>Select the operation to perform on the business object.</td>
</tr>
</tbody>
</table>
Table 3-2  (Cont.) Response Type — Delayed (Asynchronous) Response is Required

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life Cycle</td>
<td>Displays the current state of the selected business document. Active indicates the business document is available for use. Deprecated indicates the business document is nearing the end of use and must be used with caution.</td>
</tr>
<tr>
<td>Name</td>
<td>Displays the name of the selected business object.</td>
</tr>
<tr>
<td>Description</td>
<td>Displays the description of the selected business object.</td>
</tr>
</tbody>
</table>

The following table describes the fields available if no response is required.

Table 3-3  None — No Response is Required

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Type</td>
<td>Select None.</td>
</tr>
<tr>
<td>Select a Business Object</td>
<td>If you select None, this section is hidden.</td>
</tr>
</tbody>
</table>

Invoke Action Page

Select the Oracle HCM Cloud invoke action for your integration.
Invoke Operation Page

Enter the Oracle HCM Cloud invoke operation values for your integration.

See the appropriate section based on your selection on the Actions page:

- **Business Objects, Services, and Business (REST) Resources**
- **Atom Feeds**
- **Data Extracts**
- **File Upload to WebCenter (UCM)**

**Business Objects, Services, and Business (REST) Resources**

If you select **Query, Create, Update, or Delete Information** on the Actions page, the following fields are displayed.
<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Browse by** | Select to browse by business object or service. There is a one-to-one correspondence between the business object and service. The service acts on the business document.  
- **Business Objects**: Select to browse a list of available business objects.  
- **Services**: Select to browse a list of available services.  
- **Business (REST) Resources**: Select to browse a list of available business (REST) resources exposed by the interface catalog URL.  
Select the business object or service. See About SOAP Web Services in Oracle Application Cloud of Cloud SOAP Web Services for Oracle HCM Cloud for details about supported web services. |
| **Select a Business Object**  
(displayed if Business Objects is selected) | Select the business object to use. |
| **Select a Service**  
(displayed if Services is selected) | Select the service to use. |
| **Select a Service Application**  
(displayed if Business (REST) Resources is selected) | Select the business (REST) resource to use.  
You can then click **Browse and configure a child response** to select the corresponding child business resources of that parent to use.  
**Note**: Existing integrations created prior to the introduction of this feature can be edited to select parent business resources and their corresponding child business resources.  
See All REST Endpoints of REST API for Oracle HCM Cloud for details about supported REST resources. |
| **Browse and configure a child response** | Click to access a page to select the following:  
- The child and subchild business resources of the selected parent business resource  
- The operation to perform on the child and subchild business resources  
After you click **Ok**, the link name changes to **View and edit the configuration of a child resource**.  
Both the parent and child business resources are displayed on the Summary page.  
To reset to your original selections, click this link, then click **Reset**. |
<p>| <strong>Filter by type</strong> | Type the initial letters to filter the display of business objects, services, or business (REST) resources. |
| <strong>Select the Operation to Perform on the Business Object/Resource or Service</strong> | Select the operation to perform on the selected business object, business (REST) resource, or service. |</p>
<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life Cycle</td>
<td>Displays the state of the selected business object or service. Deprecated indicates the business document is nearing the end of use and must be used with caution.</td>
</tr>
<tr>
<td>Name</td>
<td>Displays the name of the selected business object or service.</td>
</tr>
<tr>
<td>Description</td>
<td>Displays the description of the selected business object or service.</td>
</tr>
</tbody>
</table>

**Atom Feeds**

If you selected the **Subscribe to Updates (via ATOM Feed)** option on the Actions page, the following fields are displayed.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select an Atom Feed</td>
<td>Select the feed of interest to the downstream application.</td>
</tr>
<tr>
<td>Learn more about HCM Cloud ATOM feeds</td>
<td>Click to access a page that describes how Atom feed subscriptions work.</td>
</tr>
<tr>
<td>Max entries to process</td>
<td>Select the number of feeds to process.</td>
</tr>
<tr>
<td>Process Future Dated Entries Immediately</td>
<td>Select to process future-dated feeds immediately. If not selected, future-dated feeds are processed when the effective date is reached. The integration is responsible for handling not-yet-effective, future-dated entries. The elements that appear in the mapper are different based on your selection. If <strong>Process Future Dated Updates Immediately</strong> is not selected, the request mapper shows the <strong>updated-min</strong> element under ApplicationPullParameter. If <strong>Process Future Dated Updates Immediately</strong> is selected, the request mapper shows the <strong>published-min</strong> element under ApplicationPullParameter. This makes future-dated Atom entries appear in their respective Atom feed immediately once the future-dated action is taken.</td>
</tr>
</tbody>
</table>
Include Business Object in ATOM Feeds

Select this checkbox to send an HTTP request for each entry in the feed to the ATOM server to fetch the business object snapshot.

- If not selected, changed and context attributes are used during design time and runtime, the operation name in the mapper does not have the suffix `WithBO`, and the business object is not shown under the operation name element.
- If selected, context attributes, changed attributes, and business object snapshots are used.

The maximum number of entries to process is set to 1000 entries and cannot be changed. This sets the value of the query parameter `page-size` that is sent as part of the request to the Atom server to get the feed. ATOM server returns a maximum of 1000 entries as part of the feed.

Data Extracts

If you selected the **Extract Bulk Data using HCM Extracts** option on the Actions page, the following questions are displayed to complete the configuration.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What is the Integration Name for HCM Extracts</strong></td>
<td>Specify the name. The HCM extract with a matching integration name is downloaded to Oracle Integration.</td>
</tr>
<tr>
<td><strong>Specify release date-time of extract</strong></td>
<td>Specify the time of the extract. The extracts released after the specified date-time are eligible for download. A sample specified date-time value is 6/22/17 5:04 AM.</td>
</tr>
</tbody>
</table>
| **Select actions that need to perform on extract in following list** | Select the actions to perform on the extract:  
  - **Decrypt the extract**: Extract is decrypted if it is in encrypted form and PGP information is present in the connection configuration.  
  - **Unzip the extract**: Extract is unzipped if it is in a zipped format. The selected actions are performed on the extract after download to Oracle Integration. |

File Upload to WebCenter (UCM)

If you selected **File Upload to WebCenter (UCM)** on the Actions page, select the security group and doc account required for uploading the file.
<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security Group</td>
<td>Select the security group in which to upload the file. A security group is a set of files grouped under a unique name. Every file in the content server repository belongs to a security group. Access to security groups is controlled by permissions assigned to roles on the content server. Roles are assigned to users where they are maintained in Oracle Fusion Applications. The default security group in Fusion Applications is FAFusionImportExport.</td>
</tr>
<tr>
<td>Doc Account</td>
<td>Select the doc account to assign to the file. In Fusion Applications, every content item has an account assigned to it. You must have the appropriate permission to the account such as read and/or write. The access to the document is the intersection between account permissions and security group permissions. There are several Fusion Applications accounts.</td>
</tr>
<tr>
<td>Encrypt the File</td>
<td>Select this checkbox to encrypt the file before upload to UCM. To select this checkbox, you must have selected to encrypt the file when configuring the Oracle HCM Cloud Adapter connection on the Connections page. See Configure Connection Security.</td>
</tr>
</tbody>
</table>

See Understanding Security and User Access of Administering Oracle WebCenter Content.

**Summary Page**

You can review the specified adapter configuration values 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 Back. Click Cancel to cancel your configuration details.</td>
</tr>
</tbody>
</table>
Implement Common Patterns Using the Oracle HCM Cloud Adapter

You can use the Oracle HCM Cloud Adapter to implement the following common patterns.

Topics:
• Upload a File to Oracle WebCenter Content
• Subscribe to Atom Feeds in a Scheduled Integration
• Configure the Extract Bulk Data Option in an Integration
• Invoke an Endpoint Dynamically

Upload a File to Oracle WebCenter Content

You can upload a file to Oracle WebCenter Content (Universal Content Manager) with the Oracle HCM Cloud Adapter. The file to upload can be either encrypted or unencrypted. This section provides a high-level overview for performing this scenario.

To upload a file to Oracle WebCenter Content:

1. Create an Oracle HCM Cloud Adapter connection with the **Invoke** role. During connection configuration, you can select to optionally encrypt the file to upload by selecting the **PGP Public Key for UCM Upload** checkbox.

2. Create an orchestrated integration.
3. Drag the Oracle HCM Cloud Adapter to the invoke part of the integration canvas. This invokes the Adapter Endpoint Configuration Wizard.

4. On the Actions page, select **File Upload to WebCenter (UCM)**.

5. On the Operations page, select the following mandatory values:
   - **Security Group**: Select the security group to which the file to upload belongs. A security group is a set of files grouped under a unique name. Every file in the UCM server repository belongs to a security group. Access to security groups is controlled by permissions assigned to roles on the content server. Roles are assigned to users where they are maintained on Oracle Fusion Applications. The default security group in Fusion Applications **FAFusionImportExport**.
   - **Doc Account**: Select the doc account for the file to upload. In Fusion Applications, every content item has an account assigned to it. You must have the appropriate permission to the account such as read and/or write. Access to the document is the intersection between account permissions and security group permissions.
6. If you selected to encrypt the file to upload on the Connections page in Step 1, select Encrypt the File.

7. Once the UCM file upload endpoint is saved, provide the reference to the file to upload to UCM.

You can also override the security group and doc account that you previously set by hard coding new values in the mapper that receive reference during runtime.

If file upload is successful, a document ID is returned. Use the document ID for downstream processing.

8. Complete design of the integration.
Subscribe to Atom Feeds in a Scheduled Integration

This use case provides an overview of creating a scheduled orchestrated integration using the Oracle HCM Cloud Adapter to subscribe to Atom feeds. Atom feeds enable you to track changes made to feed-enabled resources in Oracle Global Human Resources Cloud. For any updates of interest to downstream applications such as new hires, terminations, employee transfers, and promotions, Oracle Global Human Resources Cloud publishes Atom feeds. For this use case, the Oracle HCM Cloud Adapter is configured with the Atom feed **Employee Update**. This feed consists of three updates (**PrimaryPhoneNumber**, **CitizenshipStatus**, and **CitizenshipId**). An FTP Adapter is also configured to write any feed updates to an FTP server.

There are two types of entries published by Oracle Global Human Resources Cloud in any feed:

- Entries that are already effective.
- Entries that are effective in the future (known as future dated entries).

Design the integration based on these requirements. If the integration must process future dated entries, there are the following options:

- Future dated entries are processed on their effective dates.
- Future dated entries are processed immediately.

Process Future Dated Entries on Their Effective Dates

Oracle Global Human Resources Cloud processes future dated entries on their effective dates. This use case provides an overview of how to design this type of integration.

1. On the Connections page, create and configure an Oracle HCM Cloud Adapter with the following details:
   a. Specify a name.
   b. In the Configure Connectivity dialog, specify both a service catalog WSDL URL and an interface catalog URL. If the interface catalog URL is not specified, the **Subscribe to Updates (via Atom Feed)** option is not displayed on the Actions page of the Adapter Endpoint Configuration Wizard.
   c. In the Credentials dialog, select the **Username Password Token** security policy and specify the login credentials.

2. On the Integrations page, create a scheduled orchestrated integration.

3. Drag the Oracle HCM Cloud Adapter into the integration canvas as an invoke connection and configure the Adapter Endpoint Configuration Wizard with the following details:
   a. On the Basic Info page, specify a name (for this example, **getData**).
   b. On the Actions page, select **Subscribe to Updates (via Atom Feed)**.
   c. On the Operations page, select the following:
      - From the **Atom feed** list, select **Employee Update**.
      - Select the **Include Business Object in Atom Feeds** checkbox to send an HTTP request for each entry in the feed to the Atom server to fetch the lat-
est snapshot of the business resource. The checkbox behavior is as follows:

- Not selected: Context and changed attributes are used during design time and runtime. The operation name in the mapper does not have the suffix `WithBO` and the business object is not shown under the operation name element.

- Selected: Both context attributes and business object attributes are used during design time and runtime. The operation name in the mapper has the suffix `WithBO`.

- Select the maximum number of entries to process from the **Max entries to process** list. This sets the value of the `page-size` query parameter that is sent as part of the request to the Atom server to get the feed. The Atom feed size is limited by this number. The recommendation is to use a small number for this option and have the integration execute more frequently.

4. Double-click the schedule icon, and select **Edit** to create a schedule parameter (for this example, named `ts`). The initial value must be a timestamp to which to start. Entries are received during runtime from this timestamp onwards. The timestamp must be of following format:

   `YYYY-MM-DDTHH:MM:SS:SSSZ` e.g. `2018-06-03T02:34:06.000Z`

   where:

   - **YYYY**: Four-digit year
   - **MM**: Two-digit month (01=January, and so on)
   - **DD**: Two-digit day of the month (01 through 31)
   - **hh**: Two digits of the hour (00 through 23) (am/pm NOT allowed)
   - **mm**: Two digits of the minute (00 through 59)
   - **ss**: Two digits of the second (00 through 59)
   - **s**: Three digits representing a decimal fraction of a second (that is, milliseconds)

   This parameter ensures that new entries are processed every time the integration is invoked. The timestamp of the last processed entry must be stored in this parameter. This value is available across invocations of the integration. For the first request, the `updated-min` query parameter value is blank, which returns the latest `n` number of entries in the feed, where `n` is the value selected for the **Max entries to process** option on the Operations page.

5. In the request mapper between the schedule and the Oracle HCM Cloud Adapter, map `$ts` (timestamp value) to `updated-min`. The Oracle HCM Cloud Adapter sends the `updated-min` query parameter to the Atom server when requesting a
feed. The Atom server returns a feed with updated entries occurring after newer updates to the timestamp value. This enables new updates to be processed every time and prevents the same update from being processed multiple times.

6. Add and configure a For Each action below the Oracle HCM Cloud Adapter in the integration canvas.

Because the Include Business Object in Atom Feeds option was selected on the Operations Page, the mapper shows the business object (Emps), the context (EmployeeUpdateFeedWithBO_Context), the changed attributes (ChangedAttributes), and the timestamp. The timestamp is the updated element from the feed’s entry. This is used to track processed entries. This is done with the help of the schedule parameter. The first For Each action iterates through the entries as follows.

7. Add and configure a second For Each action inside the first For Each action to iterate through the changed attributes.
8. Add and configure an FTP Adapter inside the second **For Each** action in the integration.

For each changed attribute, a file is written to the FTP server. You can also use a REST Adapter connection to send multiple patch requests to an endpoint with these changes.

At the end of the first loop (for this example, named **loop1**), the **ts** schedule parameter is updated with the timestamp of the entry. This is stored in the database and available for subsequent invokes. This value is persisted across subsequent integration runs and also across deactivations and activations. This is how the processed entries are tracked. Because the **ts** schedule parameter is used in the request mapping, in subsequent invokes it uses its value from the database. Therefore, only new entries are processed.

9. Add an **Assign** action at the bottom of the first **For Each** action (**loop1**). The assign activity is placed at the end of **loop1** for fault tolerance. If a fault occurs when writing to the FTP location, the updated timestamp of the last processed entry is used for the next invoke.

The **updated_timestamp** element is selected from the update element (entry in the feed) as the value for schedule parameter **ts** as follows.
When the integration is invoked by the schedule, a file is created in the FTP directory for each of the changed attributes. The complete design of the integration is as follows:
Process Future Dated Entries Immediately

Oracle Global Human Resources Cloud processes future dated entries immediately, as soon as they are published. This use case provides an overview of the differences...
between designing an integration to process future dated entries on their effective dates and designing an integration to process future dated entries immediately.

- On the Operations page, select **Process Future Dated Entries Immediately**. Enabling this checkbox changes the request map to have a different query parameter, `published-min`.

- In the request mapper between the schedule and the Oracle HCM Cloud Adapter, map `$ts` (timestamp value) to `published-min`.

![Map to getData](image1)

- To make future dated entries available immediately in the feed, you must send `published_timestamp` as `published-min` in the request. `published_timestamp` must also be persisted in the `ts` scheduled parameter to process new entries in subsequent invokes of the flow. `ts` must store the `published_timestamp` as follows.

![ts](image2)

**Summary**

In summary, the following changes are required in the integration for handling future dated entries.
### Configure the Extract Bulk Data Option in an Integration

You can use the extract bulk data option in an orchestrated integration. This section provides a high-level design of an integration using this feature.

**Note:**

You must schedule and create the HCM data extract in Oracle HCM Cloud. It must be configured with a delivery option of type *WebCenter Content*. When configuring this delivery option, the **Integration Name** field must be populated with a unique value that is later specified in the **What is the Integration Name for HCM Extracts** field of the Operations page when configuring the Oracle HCM Cloud Adapter.

To configure an extract bulk data integration:

1. Create a scheduled, orchestrated integration pattern.
2. Add a schedule parameter to store the processed Document ID and initialize it with a value of 0. An HCM extract is associated with a Document ID. Once the extract is processed by the integration, the ID is stored in the schedule parameter. This value is required as input by the data extract operation in the Oracle HCM Cloud Adapter.
3. Drag the Oracle HCM Cloud Adapter to the invoke section of the integration canvas and configure the extract bulk data operation.
4. Configure the mapper for the data extract operation and map the **schedule** parameter with the **lastProcessedDocumentID** field.
5. Drag a **Stage File** action to the integration canvas. This invokes the Configure Stage File Action wizard:
   a. On the Configure Operation page, select the **Read File in Segments** operation.
   b. Map the **filename** and **directory** from the data extract response payload in the Expression Builder.

<table>
<thead>
<tr>
<th>Future Dated Entries Options</th>
<th>Request Parameters</th>
<th>Mapper View</th>
<th>Timestamp Stored in Schedule Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processed immediately</td>
<td>published-min</td>
<td></td>
<td>published_timestamp</td>
</tr>
<tr>
<td>Processed on their effective dates</td>
<td>updated-min</td>
<td></td>
<td>updated_timestamp</td>
</tr>
</tbody>
</table>
On the Schema Options page, select an existing schema from the file system.

i. On the Format Definition page, upload the extract schema. This schema should belong to the HCM extract and must be exported from Oracle HCM Cloud.

ii. For the Select Repeating Batch Element field, click the Expression Builder icon. The extract schema is shown in the Source tree.

iii. Identify and select the repeating element from the schema.

d. In the Stage File scope, use any appropriate adapter to process the extract.

6. Immediately after the Stage File scope, assign the processed Document ID in the schedule parameter. This enables you to use this value the next time the Oracle HCM Cloud Adapter is invoked.

Invoke an Endpoint Dynamically

You can dynamically invoke a REST endpoint/URL at runtime without configuring additional invoke connection or REST outbound details. As long as the Oracle HCM Cloud REST APIs return a response with HATEOS links, you can use this feature by mapping the HATEOS link to the invoke connection. This feature is useful in situations that require invoking a REST endpoint dynamically or when the endpoint is not known at design time. This feature is also useful in situations that require invoking multiple REST services, all of which accept the same input payload and return the same response payload as configured for the outbound endpoint. For these cases, this feature eliminates the need to create multiple connections to invoke each REST endpoint.

Note:

Note the following restrictions.

- The request and response schema must be the same as provided during endpoint configuration.
- Template parameters are not supported while mapping these properties.
- The HTTP verb cannot be changed for the endpoint URL. For example, if the endpoint is configured to use POST, the outgoing request uses POST even if the endpoint URI changes at runtime.
- Because the endpoint URL is determined at runtime, there is no facility to test whether the security credentials provided during connection configuration also work with the new endpoint URL. If you think the endpoint URL determined at runtime requires a different authorization header then the original URL, you may need to provide a mapping for the authorization standard header.
This use case provides a high level overview of one way to design an integration that uses dynamic endpoints. You retrieve child objects using the REST API (for example, Primary Address is a child object of the Account parent object). The integration is designed as follows.

- An initial invoke is configured to get the Account object by using the REST API. The response of this REST API does not provide the child objects. Instead, there are HATEOS links to the child objects (that is, the Primary Address object).
- A second invoke uses the HATEOS links from the earlier response to make another invoke connection to the REST endpoint to fetch the child Primary Address object using dynamic REST endpoint support.

To change the endpoint configuration at runtime, you map one or more of the various properties under the `ConnectivityProperties` target element.

1. Create an orchestrated integration.
2. Drag an adapter into the integration canvas as an trigger connection (it can be any adapter).
3. Configure the adapter in the Adapter Endpoint Configuration Wizard.
4. Drag an initial Oracle HCM Cloud Adapter into the integration canvas as an invoke connection.
5. Configure it to use the `crmRestApp` service application, the `Account` object (business resource), and the `get` operation.

The response of the first invoke connection contains a collection of HATEOS links, each pointing to a child object such as `Primary Address`.

6. In the mapper between the trigger adapter connection and the Oracle HCM Cloud Adapter invoke connection, map source elements to target elements. For this example, a `PartyNumber` source element is passed to an `id` target element.

7. Add a for-each action to iterate between the HATEOS links. The value in the **Repeating Element** field is from the response object.

8. Add a switch action to get the HATEOS link corresponding to the `Primary Address` object.
9. Drag the Oracle HCM Cloud Adapter into the switch action as the second invoke connection.

10. Configure it to use the `crmRestApp` service application, the `Primary Address` object (business resource), and the `getAll` operation. This object uses dynamic REST endpoint support. The `Primary Address` is a collection of links. The `getAll` operation is selected for getting all the HATEOS links.

11. In the mapper immediately before the second Oracle HCM Cloud Adapter invoke connection, expand `RestApi` under `ConnectivityProperties` in the target section.

12. From the source section, map `href` to `AbsoluteEndpointURI` under `ConnectivityProperties`. The `ConnectivityProperties` schema element supports dynamic REST endpoints. The `href` element points to the `Primary Address` object link. The `href` element is invoked by the Oracle HCM Cloud Adapter.
13. If necessary, map other nodes under **ConnectivityProperties**. The runtime values provided by these mappings dynamically configure the request.

You can also hover the cursor over these properties for brief descriptions.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AbsoluteEndpointURI</td>
<td>Represents the absolute endpoint URL that the REST Adapter invokes. Empty values are ignored. To route the request to an endpoint URL determined at runtime, provide a mapping for this element. <strong>AbsoluteEndpointURI</strong> takes first precedence among other URL-related properties under <strong>ConnectivityProperties</strong>.</td>
</tr>
<tr>
<td>BaseUri</td>
<td>The equivalent of the base URL provided during connection configuration. To substitute only the base URI and retain the rest of the URL, provide a mapping for this element. The mapping is ignored if <strong>AbsoluteEndpointURI</strong> has a nonempty runtime value.</td>
</tr>
<tr>
<td>RelativeUri</td>
<td>Forms the part of the endpoint URI between <strong>BaseUri</strong> and ?. The mapping has no effect if <strong>BaseUri</strong> has an empty runtime value or <strong>AbsoluteEndpointURI</strong> has a nonempty runtime value. The runtime value must start with a /.</td>
</tr>
<tr>
<td>Uri</td>
<td>Use the various elements under this node to substitute runtime values for the specific parts of an endpoint URL.</td>
</tr>
<tr>
<td>Scheme</td>
<td>Provide a mapping to change only the scheme of the endpoint URL. Supported values are <strong>HTTP</strong> and <strong>HTTPS</strong>.</td>
</tr>
<tr>
<td>Host</td>
<td>Provide a mapping to change only the <strong>Host</strong> portion of the endpoint URL.</td>
</tr>
<tr>
<td>Port</td>
<td>Provide a mapping to change only the port of the endpoint URL.</td>
</tr>
<tr>
<td>Query</td>
<td>Provide a mapping to change only the query portion of the endpoint URL. A query portion follows the ?.</td>
</tr>
<tr>
<td>Path</td>
<td>Provide a mapping to change only the path portion of the endpoint URL. A <strong>Path</strong> is the part of a URI between the hostname and ?.</td>
</tr>
<tr>
<td>Plugin</td>
<td>The various properties under this node impact the way the REST Adapter invokes the endpoint URL.</td>
</tr>
<tr>
<td>PostQueryString</td>
<td>When the runtime value is <strong>true</strong> and the HTTP verb is POST, the query string parameters are sent using POST as form parameters. The default is <strong>false</strong>.</td>
</tr>
<tr>
<td>Element</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>UseFormUrlEncoding</td>
<td>When the runtime value is false, the REST Adapter uses RFC 3986-compliant encoding to encode the query parameters. The default is true. This is the equivalent of setting the custom header x-ics-use-x-www-form-urlencoded to false. See section &quot;RFC 3986 Support for Encoding Query Parameters&quot; for more information on x-ics-use-x-www-form-urlencoded. x-ics-use-x-www-form-urlencoded takes precedence when both are set.</td>
</tr>
</tbody>
</table>

14. Drag an FTP Adapter to the switch action for writing the Primary Address object response to a file on an FTP server.

15. In the mapper between the Oracle HCM Cloud Adapter and the FTP Adapter, map the Primary Address object details.
16. When complete, integration design looks as follows:

17. Activate and invoke the integration. The Oracle HCM Cloud Adapter invokes the endpoint URI determined at runtime.
5

Troubleshoot the Oracle HCM Cloud Adapter

Review the following topics to learn about troubleshooting issues with Oracle HCM Cloud Adapter.

Topics:

• Unsupported SOAP APIs Available for Selection
• ATOM Feeds Option Not Appearing for Selection in the Operations Page
• Manual Metadata Refresh is Required if Updating the Connection to Use the Interface Catalog URL

Additional integration troubleshooting information is provided. See Troubleshoot Oracle Integration in Using Integrations in Oracle Integration.

Avoid Missing Atom Entries When Processing Them Page-Wise

The Oracle HCM Cloud Adapter fetches fewer entries from the Atom server as compared to Postman or curl in a single invoke. The Oracle HCM Cloud Adapter provides a solution to avoid missing these entries when processing them page-wise.

Assume you fetch a single page of entries when polling an Atom feed with Postman. If the last entry in the response/page has an identical updated timestamp as the next few entries on the consecutive invoke’s response/page, these further entries (with the same updated timestamp) are never included in the subsequent response because the updated-min and published-min parameters are not inclusive.

To fix this issue, the Oracle HCM Cloud Adapter processes $N$ entries (the number of entries with the same updated timestamp towards the end of the page). Here, $N$ is the total number of entries on the page. The remaining entries are included in the next invocation. This ensures that no entries are skipped.

Unsupported SOAP APIs Available for Selection

When browsing for services on the Operations page of the Adapter Endpoint Configuration Wizard, unsupported services may appear for selection. If you select an unsupported service (for example, the CreateWorker service), a null pointer exception is displayed.

See Business Object Services of Cloud SOAP Web Services for Oracle HCM Cloud for the only supported SOAP APIs.
ATOM Feeds Option Not Appearing for Selection in the Operations Page

If the **Subscribe to Updates (via ATOM Feed)** option does not appear for selection on the Actions page in the Adapter Endpoint Configuration Wizard, note the following potential causes:

- The interface catalog URL has not been specified on the Connections page.
- The Atom feed feature may not be enabled for your Oracle Integration instance. Contact Oracle Support Services.

See **Configure Connection Properties**.

Manual Metadata Refresh is Required if Updating the Connection to Use the Interface Catalog URL

If an existing Oracle HCM Cloud Adapter connection is updated to add the interface catalog URL, you must manually refresh the metadata. Go to the Connections page and find the Oracle HCM Cloud Adapter to refresh.

See **Refresh Integration Metadata**.