Oracle® Construction and Engineering

Using the Oracle Primavera Cloud Adapter with Oracle Integration 3

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Oracle Construction and Engineering Using the Oracle Primavera Cloud Adapter with Oracle Integration 3,

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Preface

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

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

Topics:

Audience

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

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the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

Related Resources

See these Oracle resources:

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

Conventions

The following text conventions are used in this document:

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

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Understand the Oracle Primavera Cloud Adapter

Review the following conceptual topics to learn about the Oracle Primavera 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 Primavera Cloud Adapter Capabilities

The Oracle Primavera Cloud Adapter enables you to create a connection to Oracle Primavera Cloud from within Oracle Integration. You can then add that connection to an integration and map selected business objects in Oracle Primavera Cloud with other applications.

The following video shows an example of how to use the Oracle Primavera Cloud Adapter in Oracle Integration:

Video

The Oracle Primavera Cloud Adapter is one of many predefined adapters included with Oracle Integration. You can configure the Oracle Primavera Cloud Adapter as an invoke connection in an integration in Oracle Integration.

The following are some of the capabilities and benefits of the Oracle Primavera Cloud Adapter.

Capabilities

- Enables you to set up a connection between Oracle Primavera Cloud and other Oracle or third-party applications or endpoints.
- Provides the ability to read a project schedule, including baselines, from Oracle Primavera Cloud in a single call.
- Makes it easy to select the business objects needed for integration.
- Provides the capability for flexible data mapping across multiple business objects.
- Provides the ability to read and write the following data in Oracle Primavera Cloud in a single call:
  - Global Data: Calendars, CBS, Rates, Resources, Roles, Workspaces
  - Project Data: Activities, Assignments, Baselines, Calendars, CBS, Cost Category, Currency, Curve, Holiday List, Location, Project Budget, Project Headers, Rates,

Relationships, Resources, Risks (Project, Program, and Activity), Roles, Scope, Tasks (Lean Task, Work Manager Task Commitments, Work Manager Task Dependency), Units of Measure, WBS, Work Packages

  - Configured fields
  - Codes
- Automatically creates or updates data without the need to specify if the data already exists.

Benefits

- Provides for a shorter time frame to create an integration with Oracle Primavera Cloud using Oracle Integration.
- Enables users to easily integrate Oracle Primavera Cloud with other applications without the full knowledge of Oracle Integration or Oracle Primavera Cloud APIs.
- Eliminates the need to use the generic technology adapter.

Oracle Primavera Cloud Adapter Restrictions

Note the following Oracle Primavera Cloud Adapter restrictions and limitations.

- Does not support deleting data in Oracle Primavera Cloud.
- Supports the synchronization of only the following business objects in Oracle Primavera Cloud:
  - Global Data: Calendars, CBS, Rates, Resources, Roles, Workspaces
  - Project Data: Activities, Assignments, Baselines, CBS, Calendars, Cost Category, Currency, Curve, Holiday List, Location, Project Budget, Project Headers, Rates, Relationships, Resources, Risks (Project, Program, and Activity), Roles, Scope, Tasks (Lean Task, Work Manager Task Commitments, Work Manager Task Dependency), Units of Measure, WBS, Work Packages
  - Configured fields
  - Codes
- Does not support the synchronization of spread values in a project schedule.

> **Note:**
>
> There are overall service limits for Oracle Integration. A service limit is the quota or allowance set on a resource. See Service Limits.

What Application Version Is Supported?

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

Oracle Primavera Cloud Adapter Use Cases

The Oracle Primavera Cloud Adapter can be used in the following scenarios:

Import and Export Project Schedule

The Oracle Primavera Cloud Adapter can be used to import the project schedule from an application to Oracle Primavera Cloud or export the Oracle Primavera Cloud project schedule, including baselines, to another application. You can create custom integration flows to handle schedule updates, track progress, or import resource, role, and calendar information from another application.

Project Initiation

The Oracle Primavera Cloud Adapter can be used to create an integration flow that will create a project and its outline in the target application after certain actions are performed in the source application.

Workflow to Create and Add an Oracle Primavera 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.

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

Step	Description	More Information
1	Access Oracle Integration.	Go to `https://instance_URL/ic/home`
2	Create the adapter connections for the applications you want to integrate. The connections can be reused in multiple integrations and are typically created by the administrator.	Create an Oracle Primavera Cloud Adapter Connection
3	Create the integration. When you do this, you add trigger (source) and invoke (target) connections to the integration.	Understand Integration Creation and Best Practices in *Using Integrations in Oracle Integration 3* and Add the Oracle Primavera Cloud Adapter Connection to an Integration
4	Map data between the trigger connection data structure and the invoke connection data structure.	Map Data in *Using Integrations in Oracle Integration 3*
5	(Optional) Create lookups that map the different values used by those applications to identify the same type of object (such as gender codes or country codes).	Manage Lookups in *Using Integrations in Oracle Integration 3*
6	Activate the integration.	Activate an Integration in *Using Integrations in Oracle Integration 3*
7	Monitor the integration on the dashboard.	Monitor Integrations During Runtime in *Using Integrations in Oracle Integration 3*

Step	Description	More Information
8	Track payload fields in messages during runtime.	Assign Business Identifiers for Tracking Fields in Messages and Track Integration Instances in *Using Integrations in Oracle Integration 3*
9	Manage errors at the integration level, connection level, or specific integration instance level.	Manage Errors in *Using Integrations in Oracle Integration 3*

2

Create an Oracle Primavera 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

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

Subscribe to Oracle Primavera Cloud

Purchase a subscription to Oracle Primavera Cloud. When you subscribe, you receive an Oracle Primavera Cloud instance URL for your region and your administrator credentials.

Set up an Integration User Account

An integration user account is a generic user account that is used to manage integrations between Oracle Primavera Cloud and other applications. Creating an integration user account is optional but recommended to keep track of data modified through integrations and to avoid issues related to using a standard user account, such as account lockouts or the employee leaving the organization. For more information, see Setting up an Integration User Account in the Oracle Primavera Cloud Application Administration Guide.

Create a Connection

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

> **Note:**
>
> You can also create a connection in the integration canvas. See why working with projects is preferred.

To create a connection in Oracle Integration:

1. Decide where to start:
   - Work in a project (see why working with projects is preferred).

a. In the navigation pane, click **Projects**.

b. Select the project name.

c. Click **Integrations**.

d. In the **Connections** section, click **Add** if no connections currently exist or **+** if connections already exist. The Create connection panel opens.

- Work outside a project.

  a. In the navigation pane, click **Design**, then **Connections**.

  b. Click **Create**. The Create connection panel opens.

2. Select the adapter to use for this connection. To find the adapter, scroll through the list, or enter a partial or full name in the **Search** field.
3. Enter the information that describes this connection.

Element	Description
Name	Enter a meaningful name to help others find your connection when they begin to create their own integrations.
Identifier	Automatically displays the name in capital letters that you entered in the **Name** field. If you modify the identifier name, don't include blank spaces (for example, `SALES OPPORTUNITY`).
Role	Select the role (direction) in which to use this connection. **Note**: *Only* the roles supported by the adapter you selected are displayed for selection. Some adapters support all role combinations (trigger, invoke, or trigger and invoke). Other adapters support fewer role combinations. When you select a role, only the connection properties and security policies appropriate to that role are displayed on the Connections page. If you select an adapter that supports both invoke and trigger, but select only one of those roles, you'll get an error when you try to drag the adapter into the section you didn't select. For example, assume you configure a connection for the Oracle Service Cloud (RightNow) Adapter as only an **invoke**. Dragging the adapter to a **trigger** section in the integration produces an error.
Keywords	Enter optional keywords (tags). You can search on the connection keywords on the Connections page.
Description	Enter an optional description of the connection.

Element	Description
Share with other projects	**Note**: This field only appears if you are creating a connection in a project. Select to make this connection publicly available in other projects. Connection sharing eliminates the need to create and maintain separate connections in different projects. When you configure an adapter connection in a different project, the **Use a shared connection** field is displayed at the top of the Connections page. If the connection you are configuring matches the same type and role as the publicly available connection, you can select that connection to reference (inherit) its resources. See Add and Share a Connection Across a Project.

4. Click **Create**.

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

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

6. Test the connection.

Configure Connection Properties

Enter connection information so your application can process requests.

1. On the **Configure a connection** page, go to the **Properties** section.
2. In the **Connection URL** field, enter the URL of your Oracle Primavera Cloud instance.

Configure Connection Security

Configure security for your connection.

1. Go to the **Security** section.
2. In the **Security policy** field, select which security policy you want to use.

Security policy	Options
Oracle Primavera Cloud Login (Basic Authentication)	• **User Name** — Enter the user name of your Oracle Primavera Cloud or integration account. • **Password** — Enter the password of your Oracle Primavera Cloud or integration account.

Security policy	Options
OAuth using JWT User Assertion	• **Access token URI** — Enter the URL where the request will be sent to obtain the access token. For example: `https://accounts.google.com/o/oauth2/token` • **JWT headers in JSON format** — Upload the JWT header file in JSON format. • **JWT payload in JSON format** — Upload the JWT payload file in JSON format. • **JWT private key alias** — Enter the JWT private key alias. This is the same alias you specified when uploading the signing key certificate on the Certificates page. • **Scope** — (Optional) Enter the scopes. • **Access token request** — (Optional) Enter the request to obtain the access token. The format you specify can vary by service provider.

Configure the Endpoint Access Type

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

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

Select the Endpoint Access Type

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

Option	This Option Appears If Your Adapter Supports ...
Public gateway	Connections to endpoints using the public internet.
Private endpoint	Connections to endpoints using a private virtual cloud network (VCN). **Note**: To connect to private endpoints, you must complete prerequisite tasks in the Oracle Cloud Infrastructure Console. Failure to do so results in errors when testing the connection. See Connect to Private Resources in *Provisioning and Administering Oracle Integration 3* and Troubleshoot Private Endpoints in *Using Integrations in Oracle Integration 3*.

Ensure Private Endpoint Configuration is Successful

- To connect to private endpoints, you must complete prerequisite tasks in the Oracle Cloud Infrastructure Console. Failure to do so results in errors when testing the connection. See Connect to Private Resources in *Provisioning and Administering Oracle Integration 3*.

- When configuring an adapter on the Connections page to connect to endpoints using a private network, specify the fully-qualified domain name (FQDN) and *not* the IP address. If you enter an IP address, validation fails when you click **Test**.
- IPSec tunneling and FastConnect are not supported for use with private endpoints.

Test the Connection

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

1. In the page title bar, click **Test**.

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

Upload a Certificate to Connect with External Services

Certificates allow Oracle Integration to connect with external services. If the external service/endpoint needs a specific certificate, request the certificate and then import it into Oracle Integration.

If you make an SSL connection in which the root certificate does not exist in Oracle Integration, an exception error 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.

1. Sign in to Oracle Integration.
2. In the navigation pane, click **Settings**, then **Certificates**.
   All certificates currently uploaded to the trust store are displayed on the Certificates page.
3. Click **Filter** to filter by name, certificate expiration date, status, type, category, and installation method (user-installed or system-installed). Certificates installed by the system cannot be deleted.
4. Click **Upload** at the top of the page.
   The Upload certificate panel is displayed.
5. Enter an alias name and optional description.
6. In the **Type** field, select the certificate type. Each certificate type enables Oracle Integration to connect with external services.
   - Digital Signature
   - X.509 (SSL transport)
   - SAML (Authentication & Authorization)
   - PGP (Encryption & Decryption)
   - Signing key

Digital Signature

The digital signature security type is typically used with adapters created with the Rapid Adapter Builder. See Learn About the Rapid Adapter Builder in Oracle Integration in *Using the Rapid Adapter Builder with Oracle Integration 3*.

1. Click **Browse** to select the digital certificate. The certificate must be an X509Certificate. This certificate provides inbound RSA signature validation. See RSA Signature Validation in *Using the Rapid Adapter Builder with Oracle Integration 3*.
2. Click **Upload**.

X.509 (SSL transport)

1. Select a certificate category.
   a. **Trust**: Use this option to upload a trust certificate.
      i. Click **Browse**, then select the trust file (for example, `.cer` or `.crt`) to upload.
   b. **Identity**: Use this option to upload a certificate for two-way SSL communication.
      i. Click **Browse**, then select the keystore file (`.jks`) to upload.
      ii. Enter the comma-separated list of passwords corresponding to key aliases.

      > **Note:**
      >
      > When an identity certificate file (`.jks`) contains more than one private key, all the private keys must have the same password. If the private keys are protected with different passwords, the private keys cannot be extracted from the keystore.

      iii. Enter the password of the keystore being imported.
   c. Click **Upload**.

SAML (Authentication & Authorization)

1. Note that **Message Protection** is automatically selected as the only available certificate category and cannot be deselected. Use this option to upload a keystore certificate with SAML token support. Create, read, update, and delete (CRUD) operations are supported with this type of certificate.
2. Click **Browse**, then select the certificate file (`.cer` or `.crt`) to upload.
3. Click **Upload**.

PGP (Encryption & Decryption)

1. Select a certificate category. Pretty Good Privacy (PGP) provides cryptographic privacy and authentication for communication. PGP is used for signing, encrypting, and decrypting files. You can select the private key to use for encryption or decryption when configuring the stage file action.
   a. **Private**: Uses a private key of the target location to decrypt the file.
      i. Click **Browse**, then select the PGP file to upload.
      ii. Enter the PGP private key password.
   b. **Public**: Uses a public key of the target location to encrypt the file.

i. Click **Browse**, then select the PGP file to upload.

ii. In the **ASCII-Armor Encryption Format** field, select **Yes** or **No**.

- **Yes** shows the format of the encrypted message in ASCII armor. ASCII armor is a binary-to-textual encoding converter. ASCII armor formats encrypted messaging in ASCII. This enables messages to be sent in a standard messaging format. This selection impacts the visibility of message content.
- **No** causes the message to be sent in binary format.

iii. From the **Cipher Algorithm** list, select the algorithm to use. Symmetric-key algorithms for cryptography use the same cryptographic keys for both encryption of plain text and decryption of cipher text. The following supported cipher algorithms are FIPS-compliant:

- AES128
- AES192
- AES256
- TDES

c. Click **Upload**.

Signing key

A signing key is a secret key used to establish trust between applications. Signing keys are used to sign ID tokens, access tokens, SAML assertions, and more. Using a private signing key, the token is digitally signed and the server verifies the authenticity of the token by using a public signing key. You must upload a signing key to use the OAuth Client Credentials using JWT Client Assertion and OAuth using JWT User Assertion security policies in REST Adapter invoke connections. Only PKCS1- and PKCS8-formatted files are supported.

1. Select **Public** or **Private**.
2. Click **Browse** to upload a key file.
   If you selected **Private**, and the private key is encrypted, a field for entering the private signing key password is displayed after key upload is complete.
3. Enter the private signing key password. If the private signing key is not encrypted, you are not required to enter a password.
4. Click **Upload**.

3

Add the Oracle Primavera Cloud Adapter Connection to an Integration

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

The following wizard pages guide you through configuration of the Oracle Primavera Cloud Adapter as an invoke in an integration.

Topics:

Configure Basic Info Page

Enter the name, description, relative resource URI, and an endpoint action.

Element	Description
What do you want to call your endpoint?	Provide a meaningful name so that others can understand the responsibilities of this connection. You can include English alphabetic characters, numbers, underscores, and hyphens in the name. You can't include the following characters: • No blank spaces (for example, `OPC Adapter Connection`) • No special characters (for example, `#;83&` or `righ(t)now4`) except underscores and hyphens • No multibyte characters
What does this endpoint do?	Enter an optional description about the connection's functionality.
Select an operation name	Select an operation for the adapter.
What is the endpoint's relative resource URI	Displays the endpoint's relative URI.
What action do you want to perform on the endpoint?	Displays the single HTTP action (method) for the endpoint to perform.

Invoke Object Selection Page

Select the objects that you want the API to read.

Element	Description
Select objects for the operation <operation name>	Select the objects for the operation you selected in the previous step. For example, for the operation `findByProjectBaselineData`, you can select Activity, Assignment, Project, and WBS. Type an object name in the field to filter for that object.
Available Objects	Displays all the available objects for an operation. Select **Move to selected** or **Move all to selected** to move the objects to the **Selected Objects** column. The most common objects for the operation are pre-selected. You can add additional objects or remove the ones you do not need.
Selected Objects	Displays the selected objects.

Invoke Field Selection Page

Select the fields for the objects you selected in the previous step.

Element	Description
Select fields for the operation <operation name>	Select each object from the drop-down menu to view the fields associated with that object.
Available Fields	Displays all the available fields for an object. Select **Move to selected** or **Move all to selected** to move the fields to the **Selected Fields** column. For some objects, the commonly used fields are pre-selected. You can add additional fields or remove the ones you do not need.
Selected Fields	Displays the selected fields for an object.

Summary Page

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

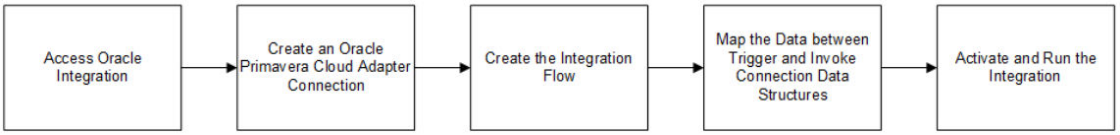
Element	Description
Summary	Displays a summary of the configuration values you defined on previous pages of the wizard. The information that is displayed can vary by adapter. For some adapters, the selected business objects and operation name are displayed. For adapters for which a generated XSD file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

4

Copy a Project from One Workspace to Another

You can copy an Oracle Primavera Cloud project from one workspace to another using the Oracle Primavera Cloud Adapter.

This section provides a high-level overview of creating an integration flow to copy a project from one workspace to another using the Oracle Primavera Cloud Adapter. It describes how to create the Oracle Primavera Cloud Adapter connection, use the connection as an invoke in an integration flow, map the data between the trigger and invoke connections, and finally activate and run the integration. A typical workflow to create and add the Oracle Primavera Cloud Adapter connection to an integration is shown below:



Topics:

Create an Oracle Primavera Cloud Adapter Connection

Before you can build an integration, you must create a connection with Oracle Primavera Cloud using the Oracle Primavera Cloud Adapter.

To create the connection:

1. In the navigation pane, select **Design**, then **Connections**.
2. Click **Create**.
3. In the **Create connection** panel, select **Oracle Primavera Cloud**.

   To find the adapter, scroll through the list, or enter a partial or full name in the **Search** field. For example, you can search for *Primavera* or *Primavera Cloud*.
4. Enter the information that describes this connection:

Field	Value
Name	`Primavera Cloud Connection`

Field	Value
Identifier	`PRIMAVERA_CLOUD_CONNECTION` The identifier is automatically added. If you want to modify the identifier, do not include blank spaces.
Role	`Invoke` The Role is automatically set to Invoke.

5. Click **Create**.
6. On the **Configure a connection** page, do the following:
   a. In **Properties** section, in the **Connection URL** field, enter the URL of your Oracle Primavera Cloud instance.

      For example:

      `https://primavera.oraclecloud.com`

   b. In the **Security** section, in the **Security policy** field, select the security policy you want to use (**Oracle Primavera Cloud Login** or **OAuth using JWT User Assertion**).

      For more information, see Configure Connection Security.

   c. In the **Access type** section, select the option for accessing your endpoint (**Public gateway** or **Private endpoint**).

      For more information, see Configure the Endpoint Access Type.
7. On the page title bar, click **Test**.

   The test starts automatically and validates the inputs you provided for the connection. You will get a notification if the test was successful.
8. Click **Save**.

Create an Integration Workflow

Integrations use the connections you created to your applications and define how information is shared between those applications.

Create an integration flow by creating an integration, and then dragging the required adapters into the invoke area of the integration. Map data between the invoke and the target connections' data structures to define how data will be transferred.

The following topics describe how to create the integration workflow for copying a project from one workspace to another.

Topics:

Create the Integration

After you create your connections, you can create the integration.

To create the integration:

1. In the navigation pane, select **Design**, then **Integrations**.
2. Click **Create**.
3. In the **Create Integration** panel, do the following:
   a. Click **Schedule**.
   b. Enter the following mandatory schedule details:
      i. In the **Name** field, enter a name for the schedule.
      You can include English alphabetic characters, numbers, underscores, and dashes in the identifier.
      ii. In the **Identifier** field, accept the default value or change it if needed.
      The name you enter in the Name field is automatically added to the Identifier field in upper case. If you want to modify the identifier, do not include blank spaces.
   c. Click **Create**.

Add an Invoke to Get Source Project By Workspace and Project Code

To get the source project details, first add the invoke (target) connection to the invoke area of the integration, and then use the Adapter Endpoint Configuration Wizard to configure the Oracle Primavera Cloud Adapter endpoint properties.

To add an invoke:

1. On the integration page, hover over an arrow and click **Add**  .
2. From the list of available connections, select **Oracle Primavera Cloud**.
3. In the Adapter Endpoint Configuration Wizard, do the following:
   a. On the **Basic Info** page:
      i. In the **What do you want to call your endpoint?** field, enter `GetProjectDetails`.
      ii. In the **What does this endpoint do?** field, enter an optional description.
      iii. In the **Select an operation name** field, select **findProjectKeys**.
      iv. The **What is the endpoint's relative resource URI?** field gets populated automatically upon entering the operation name and displays the endpoint's relative resource URI.
      v. The **What action do you want to perform on the endpoint?** field gets populated automatically upon entering the operation name and displays the single HTTP action (method) for the endpoint to perform.
   b. On the **Object Selection** page:
      i. From the **Available Objects** column, select **Project**.
      ii. Click **Move to Selected**.
      Project is moved to the **Selected Objects** column.

c. On the **Field Selection** page:

   i. From the **Select fields for the operation** drop-down menu, select **Project**.

   ii. From the **Available Fields** column, select the fields for the selected object, then click **Move to selected** to move them to the **Selected Fields** column.

   Some commonly used fields are pre-selected for you. You can add or remove fields as needed.

d. On the **Summary** page, view the summary and click **Finish**.

Map Data to Get Source Project By Workspace and Project Code

One of the key tasks to your integration is defining how data is transferred, or mapped, between the source project and workspace and the target workspace.

Mapper in Oracle Integration enables you to map element nodes between applications by dragging source element nodes onto target element nodes. 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 load data structure levels on demand to display additional levels. There is no limit on the levels of display.

To map data to get the source project by the workspace code and project code:

1. On the integration page, select **Map (getProjectDetails)**, click **Actions** ⋯, then select **Edit**.
2. On the mapper, in the **Target** section, expand **Request Parameters**, and then **Project Keys**.
3. Right-click **WorkspaceCode** and select **Create Target Node**.
4. In the **Expression Builder** (bottom of the page), click **Switch to Design View** .
5. In the **Design View** window, enter the source workspace code as text.

   For example: '`AWorkspace`'

6. Click **Save** .
7. Right-click **ProjectCode** and select **Create Target Node**.
8. In the **Expression Builder**, click **Switch to Design View** .
9. In the **Design View** window, enter the source project code as text.

   For example: '`AProject`'

10. Click **Save** , then click **Validate**.
11. Click **Go Back** , then click **Save**.

Add Invoke to Resolve Target Workspace ID

Add the invoke to resolve the target workspace ID.

To add an invoke:

1. On the integration page, hover over an arrow and click **Add** .
2. From the list of available connections, select **Oracle Primavera Cloud**.
3. In the Adapter Endpoint Configuration Wizard, do the following:
   a. On the **Basic Info** page:
      i. In the **What do you want to call your endpoint?** field, enter `ResolveTargetWorkspace`.
      ii. In the **What does this endpoint do?** field, enter an optional description.
      iii. In the **Select an operation name** field, select **resolveWorkspaces**.
      iv. The **What is the endpoint's relative resource URI?** field gets populated automatically upon entering the operation name and displays the endpoint's relative resource URI.
      v. The **What action do you want to perform on the endpoint?** field gets populated automatically upon entering the operation name and displays the single HTTP action (method) for the endpoint to perform.
   b. On the **Object Selection** page:
      i. From the **Available Objects** column, select **Workspace**.
      ii. Click **Move to Selected**.
      Workspace is moved to the **Selected Objects** column.
   c. On the **Field Selection** page:
      i. From the **Select fields for the operation** drop-down menu, select **Workspace**.
      ii. From the **Available Fields** column, select the fields for the selected object, then click **Move to selected** to move them to the **Selected Fields** column.

      Some commonly used fields are pre-selected for you. You can add or remove fields as needed.
   d. On the **Summary** page, view the summary and click **Finish**.

The invoke **ResolveTargetWorkspace** is added to the integration flow.

Map Data to Resolve Target Workspace ID

After adding the invoke to resolve the target workspace ID, map the data to resolve the target workspace ID.

To map data to resolve the target workspace ID:

1. On the integration page, select **Map (ResolveTargetWorkspace)**, click **Actions** ..., then select **Edit**.
2. On the mapper, in the **Target** section, expand **ResolveTargetWorkspace Request (Oracle Primavera Cloud)**, and then **Request Parameters**.
3. Expand **Additional Filter Conditions**.
4. Right-click **Filter** and select **Create Target Node**.
5. In the **Expression Builder** (bottom of the page), click **Switch to Design View** .
6. In the **Design View** window, enter the required target workspace code as text.

   For example: `"(workspaceCode = 'Gateway Test')"`

7. Click **Save** , then click **Validate**.
8. Click **Go Back** , then click **Save**.

Add an Invoke to Synchronize a Project to a Target Workspace

Add the invoke to synchronize a project to a target workspace.

To add an invoke:

1. On the integration page, hover over an arrow and click **Add** .
2. From the list of available connections, select **Oracle Primavera Cloud**.
3. In the Adapter Endpoint Configuration Wizard, do the following:
   a. On the **Basic Info** page:
      i. In the **What do you want to call your endpoint?** field, enter `SyncProject`.
      ii. In the **What does this endpoint do?** field, enter an optional description.
      iii. In the **Select an operation name** field, select **sync**.
      iv. The **What is the endpoint's relative resource URI?** field gets populated automatically upon entering the operation name and displays the endpoint's relative resource URI.
      v. The **What action do you want to perform on the endpoint?** field gets populated automatically upon entering the operation name and displays the single HTTP action (method) for the endpoint to perform.
   b. On the **Object Selection** page:
      i. From the **Available Objects** column, select **Workspace**.
      ii. Click **Move to Selected**.
      Workspace is moved to the **Selected Objects** column.
   c. On the **Field Selection** page:
      i. From the **Select fields for the operation** drop-down menu, select **Project**.
      ii. From the **Available Fields** column, select the fields for the selected object, then click **Move to selected** to move them to the **Selected Fields** column.

      Some commonly used fields are pre-selected for you. You can add or remove fields as needed.
   d. On the **Summary** page, view the summary and click **Finish**.

The invoke **SyncProject** is added to the integration flow.

Map Data to Synchronize a Project to a Target Workspace

Map the source project ID and workspace ID with the target project ID and workspace ID.

Map Source Project ID with Target Project ID

1. On the integration page, select **Map (SyncProject)**, click **Actions** , and then select **Edit**.

2. On the mapper, in the **Source** section, expand **ResolveTargetWorkspace Response**, and then **Resolve Workspaces Response**, and then **Workspace Result**, and then **Workspaces**, and then select **Workspace Id**.
3. In the **Target** section, expand **Request Parameters**, and then **Request**, and then **Projects**, and then select **Workspace Id**.
4. Drag the source element, **Workspace Id**, to the target element node.
5. In the **Source** section, expand **GetProjectDetails Response**, and then **Find By Project Id Response**, and then **Coarse Project**, and then **Projects**, and then select **Project Id**.
6. In the **Target** section, expand **Request Parameters**, and then **Request**, and then **Projects**, and then select **Project Id**.
7. Right-click **Project Id**, and then select **Create Target Node**.
8. In the **Expression Builder**, click **Switch to Design View**  .
9. On the top-right corner of the page, click **Toggle Functions**  .
10. Expand **Operators**.
11. From the list of operators, drag **-() Unary** to the Expression Builder.
12. Place your cursor inside the parentheses of the operator you just placed, and then from the **Source** section, drag the **Project Id** into the parentheses.

    For example:

    ```
    -($getProjecDetails/nsmpr0:findByProjectIdResponse/nsmpr0:CoarseProject/
    ns18:project/ns18:projectId)
    ```

13. Click **Save**  .

Map Source Project Code with Target Project Code

1. In the **Target** section, expand **Request Parameters**, and then **Request**, and then **Projects**, and then select **Actions**.
2. Right-click **Actions**, and then select **Create Target Node**.
3. In the **Expression Builder**, click **Switch to Design View**  .
4. In the **Design View** window, enter `Create`.
5. In the **Source** section, expand **GetProjectDetails (Oracle Primavera Cloud)**, and then **Find Project By Keys Response**, and then **Coarse Project**, and then **Projects**, and then select **Project Code**.
6. In the **Target** section, expand **Request Parameters**, and then **Request**, and then **Projects**, and then select **Project Code**.
7. Drag the source element, **Project Code**, to the target element, **Project Code**.
8. Continue to add mappings as needed between the source element, **GetProjectDetails Response (Oracle Primavera Cloud)**, and the target element, **SyncProjectRequest (Oracle Primavera Cloud)**.
9. Click **Validate**.
10. Click **Go Back**  , then click **Save**.

Activate and Run the Integration

After your integration design is complete, activate and run the integration.

To activate and run the integration:

1. In the navigation pane, click **Design**, then **Integrations**.
2. Activate the integration.
   a. Hover over the integration, then click **Activate** .
   b. In the **Activate Integration** panel, choose the appropriate level of tracing, then click **Activate**.
3. Run the integration.
   a. Hover over the integration, then click **Actions** , then select **Run**.
   b. On the **Configure and run** page, click **Run**.

   You've now successfully submitted the integration for execution.

> **Note:**
>
> You can also schedule this integration to run at a date, time, and frequency of your choosing. See Define the Integration Schedule.

Related Topics

- Activate and Deactivate Integrations in *Using Integrations in Oracle Integration 3*

A

GraphQL Playground Set Up

GraphQL Playground is an interactive API explorer where query and mutation requests can be created and executed. The GraphQL set up helps you to interact with and understand the Oracle Primavera Cloud Adapter services.

To set up GraphQL Playground:

1. Generate the access token for Oracle Primavera Cloud by using either CURL or Postman. Open a command prompt and enter the following CURL command to generate the access token.

   ```
   curl -i -X POST -H "Content-Type: application/x-www-form-urlencoded" -H
   "Authorization: Basic your_encoded_username_password" -d
   'grant_type=client_credentials' https://primavera.oraclecloud.com/
   primediscovery/apitoken/request?scope=http://primavera.oraclecloud.com/api
   ```

   > **Note:**
   >
   > - In the command above, replace `Basic your_encoded_username_password` with the Basic base64 encoded authcode. For example:
   >
   >   `Basic c3VqYXRoYS5ndWRpcGF0aUBvcmFjbGUuY29tOlByaW1hdmVyYUAx`
   > - Use a base64 converter such as https://base64.guru/converter to generate the authcode.
   > - Enter the input in your base64 converter in the `username.password` format. For example:
   >
   >   `testuser@oracle.com:Primavera@1`

2. Execute the command and copy the access token.
3. Open the Playground link: https://primavera.oraclecloud.com/api/playground.html and replace `primavera.oraclecloud.com` with your own Oracle Primavera Cloud instance.
4. On the Playground page, click **HTTP Headers** in the bottom-left, and then enter the following information:

   ```
   {
     "Authorization": "Bearer your_token",
     "x-prime-tenant-code": "idcs-d9c5e846631a4fa387b7e012a76b6370",
     "x-prime-tenant": "idcs-a17cc933a60a40149c40575d80bb6917",
     "x-prime-identity-app": "cegbu-prime_primaveracloudwtssapp_US-IAD_APPID",
     "userId": "95e21a3833a84d40b6c1efba4b055cc4",
     "x-prime-region": "EU",
     "Invoked-By": "OIC_Adapter"
   }
   ```

> **Note:**
>
> - Replace `your_token` with the access token generated using the above cURL command to authorize. Make sure to keep `Bearer` before the token.
> - Update the other required header parameters, such as `x-prime-tenant-code` and `x-prime-tenant`.

5. Select the **Docs** tab.

   After the headers are set properly, the **Docs** and **Schema** tabs are displayed on the right side of the page.

6. Select **Queries**, and then select any query to view its details.