Oracle
Primavera
Gateway Microsoft Project Provider Setup Guide

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Contents

Overview

Primavera Gateway is an application that facilitates sharing and synchronizing project, resource, and other data between Primavera applications and enterprise applications. By using providers, which are used as a channel to connect with the corresponding software application, Primavera Gateway enables you to share data with other enterprise applications. For a quick synopsis, watch the ***Overview of Primavera Gateway*** (***https://players.brightcove.net/2985902027001/SyXjZnYeeb_default/index.html?videoId=6174404031001***) video.

The MSP provider in Gateway enables you to send data from an MSP file to any enterprise application supported by Primavera Gateway.

> **Note**: Data from an MSP file can only be sent or received in XML format.

To send data using Microsoft project, you will need to:

1) Edit business objects in the relevant data dictionary to verify fields are included and supported for data transfers.

   For more details, see the chapter, *Working with Data Dictionaries (on page 23).*
2) Add field-mapping templates that include business objects and their supported fields included in the data transfer.
3) For more details, see the chapter, Working with Field-Mapping Templates.
4) Add business flows to support field mapping templates for the data transfer.

   For more details, see the chapter, ***Working with Business Flows*** (on page 35).
5) Synchronizations that send that data to the destination application.

   For more details, see the chapter, ***Working with Synchronizations*** (on page 51).

The *Primavera Gateway Microsoft Project Provider Setup Guide* describes how to set up an integration between Microsoft Project (MSP) and your enterprise application.

Within our documentation, some content might be specific for cloud deployments while other content is relevant for on-premises deployments. Any content that applies to only one of these deployments is labeled accordingly.

In This Section

Managing Personal Information

Consent notices enable you to convey to your users how personal information (PI) is collected, processed, stored, and transmitted, along with details related to applicable regulations and policies. Consent notices also alert users that the action they are taking may risk exposing PI. Primavera Gateway helps you to ensure that you have requested the appropriate consent to collect, process, store, and transmit the PI your organization holds as part of Primavera Gateway data.

For more details on how to configure consent forms and manage PI data in Gateway, see *Primavera Gateway Administration Guide*.

Setting Up the Integration Environment for On-Premises

To set up an integration between the MSP Provider and an enterprise application of your choice supported by Primavera Gateway you will need to install:

1) Download and install an enterprise application of your choice for which you have created a Gateway provider application

   or

   install any of the following products supported by Gateway. These include:

   - Oracle Instantis EnterpriseTrack
   - P6 EPPM
   - Oracle Primavera Cloud
   - Primavera Unifier

2) Install Primavera Gateway with the following providers:

   - MSP Provider

     Use the Gateway configuration utility to add MSP provider as a third-party provider. For more details, see the *Primavera Gateway Installation and Configuration Guide.*

   - Provider application you choose to integrate data.

     For example, if you are planning to integrate data between MSP and P6, then install the Gateway and also P6 Provider during installation. For more details, see the *Primavera Gateway Installation and Configuration Guide.*

- If you choose to integrate data with P6 EPPM, you will also need:
  - P6 Web Services

    P6 Web Services supports SAML 2.0 authentication. If you choose to use SAML 2.0 authentication between the P6 provider in Gateway and P6 EPPM, then SAML authentication must be enabled in P6 EPPM and Primavera Gateway applications. The server administrator must download the SAML token XML file on the Gateway server machine where the P6 deployment is to be created.

    The token must also be downloaded for Oracle Access Manager. For more details, see *Primavera Oracle Access Manager Configu*ration G*uide.*

  - P6 eventing

    To use the *P6event provider* delivered in Gateway, event notification must be enabled using JMS Queues for messaging in P6 and Gateway.

    To enable event notifications in P6, see *P6 EPPM Business Object Events Guide* in the P6 EPPM documentation library.

    To enable P6 event notification in Gateway, see the *Primavera Gateway Installation and Configuration Guide*.

For detailed installation instructions, see the *Installation and Configuration Guide* for each product. For specific supported software versions, see the *Tested Configurations* document for each Oracle application.

In This Section

Configuring Gateway for P6 Event Notification for On-Premises

If you choose to use the P6 Event provider delivered in Gateway, then configure the Gateway WebLogic domain to consume P6 event messages as follows:

1) Ensure the Primavera Gateway domain is running.
2) Sign in to the WebLogic Administration Server Console for the Gateway domain:
   a. In a browser, enter the following location:

      http://<hostname>:<port>/console

      Where, hostname and port is the hostname and port of your Primavera Gateway domain in WebLogic. The default port is **7001**.
   b. Enter the WebLogic administrator user name and password.
3) In the **Change Center** pane, select **Lock and Edit** before you make any changes to the domain.
4) Create a JMS server as follows.
   a. In the **Domain Structure** pane, expand **Services, Messaging, JMS Servers.**
   b. In the **Summary of JMS Servers** pane, select **New**.

      Note: Select **Next** on each screen to advance to the next step.

      1. Enter a **Name** for the JMS Server. For example, *Gateway JMS Server*.
      2. Select **Create a New Store**.
      3. In the **Type** list, select *File Store*.
      4. Enter a **Name** for the File Store.
      5. Select the **Target** for the file store:

         For Admin server, select *AdminServer.*

         For Managed server, select *GatewayCluster*.
      6. Enter the **Directory** of the physical location of the file store. For example, c:\JMSFilestore.
      7. Select **OK**.
      8. Select **Finish**.
5) Create a JMS module as follows:
   a. In the **Domain Structure** pane, expand **Services, Messaging,** and **JMS Modules**.
   b. In the **Summary of JMS Modules** pane, select **New**.
      1. Enter a **Name** for the JMS module.
      2. Depending on your configuration, select the **Target** for the file store, as *AdminServer,* or *GatewayCluster* for a managed server.

3. Select **Finish**.

6) Create a Foreign Server in the JMS module as follows:
   a. In the **Domain Structure** pane, expand **Services, Messaging,** and **JMS Modules**.
   b. Select the JMS module created in step 5.
   c. On the **Configuration** tab of the **Settings for <JMS Module>** pane, select **New**.
   d. Select **Foreign Server**.
   e. Enter a **Name** for the foreign server.
   f. Depending on the configuration, select the **Target** as *AdminServer,* or *gatewayCluster* for a Managed server.
   g. Select **Advanced Targeting** and then select **Create a New SubDeployment**.
   h. Enter a name for the **subdeployment** and then select **OK**.
   i. In the **subdeployment** list, select the created subdeployment.
   j. Depending on your configuration, select the **Target** as *AdminServer,* or *gatewayCluster* for a Managed server, and the JMS server created in step 4.
   k. Select **Finish**.
   l. Select **Save** to save the foreign server with a subdeployment.
7) Enter configuration settings for the foreign server created as follows:
   a. Select the foreign server created in step 6.
   b. In the **Settings for <Foreign Server Name>** pane, select the **Configuration tab**, and then the **General** tab.
   c. Select the new foreign server created and enter values for the following configuration settings:
      - In the **JNDI Initial Context Factory** field**,** retain the default value.
      - In the **JNDI Connection URL** field, enter the URL to the P6 EPPM domain in the format: *t3://<P6_EPPM_host>:<port>/*
      - In the **JNDI Properties Credential** field, enter the P6 EPPM WebLogic domain password.
      - In the **Confirm JNDI Properties Credential** field, reconfirm the entered password.
      - In the **JNDI Properties** field, enter the P6 EPPM WebLogic domain user name in the following format: *java.naming.security.principal=<P6 EPPM WebLogic domain user name>*
      - Select **Save**. The newly created foreign server displays in the **Configuration** tab.
   d. Create a connection factory for the foreign server as follows:
      1. In the **Settings for <Foreign Server Name>** pane, select the **Configuration tab**, and then the **Connection Factories** tab.
      2. Select **New**.
      3. Enter a **Name** for the connection factory.
      4. Enter the **Local JNDI Name**. For example, *jms/newCF*.

> **Note:** Make a note of the value entered in this field. You will need to enter this value to set up an event provider to a P6 Application

deployment.

5. Enter the JNDI name of the P6 EPPM Connection Factory as the **Remote JNDI Name**. For example, jms/P6ConnectionFactory.
6. Select **OK**.

e. Create a destination for the foreign server as follows:

1. In the **Settings for <Foreign Server Name>** pane, select the **Configuration tab**, and then the **Destinations** tab.
2. Select **New**.
3. Enter a name for the foreign destination.
4. In the **Local JNDI Name**, enter the name of the JMS queue used by Gateway. For example, *jms/newGWQueue*.

Note: Make a note of the value entered in this field. You will need to enter this value to set up an event provider to a P6 Application deployment.

5. Enter the name of the P6 EPPM JMS queue as the **Remote JNDI Name**. For example, *jms/P6Queue*.
6. Select **OK**.

8) In the **Change Center** pane, select **Activate Changes** to enforce all the changes made to the domain.

Enabling Encryption Between Gateway and P6 Web Services for On-Premises

To ensure all requests and responses between Primavera Gateway and P6 Web Services are encrypted, you need a keystore file for encryption. There are several methods for generating a keystore file.

You can use the following sequence to generate and use the same keystore file on all servers:

1) Create a Keystore file as follows:

a. Create a folder, for example, C:/keystore.

b. Use the Java keytool genkey command to create a keystore with the private key:

From the command line, execute:

```
keytool -genkey -alias <alias_name> -keyalg RSA -sigalg SHA1withRSA
-keypass <keyPassword> -storepass <storePassword> -keystore
<keystore file location>
```

Where:

`<alias>` is the key alias

`<keyPassword>` is the password of the private key

`<storePassword>` is the password of the keystore

For example:

```
keytool -genkey -alias myAlias -keyalg RSA -sigalg SHA1withRSA
-keypass myPassword -storepass myPassword -keystore
c:\keystore\keystore.jks
```

c. Enter information for each of the following questions:
   - What is your first and last name?
     Enter the Gateway host name.
   - What is the name of your organization?
   - What is the name of your city or locality?
   - What is the name of your state or province?
   - What is the two-letter country code for this unit? For example, US.
   - Is CN=<Gateway host name>, OU=<organization unit name>, O=<organization name>, L=<location>, ST=<state code>, C=<country code> correct? Enter `Y` or `N`.

> **Note:** If P6 Web Services is deployed on other than a Gateway machine, then copy the keystore folder with keystore.jks to the P6 Web Services machine.

2) In the Gateway user interface, select the **Configuration** tab and enter deployment information for P6. For more details, see ***Adding or Editing a P6 Deployment Connection*** (on page 17).
3) In P6 EPPM administration application:
   a. Enter the keystore information that was entered in the keystore file. The values must be identical.
   b. Modify the message protection node setting as follows:
      - Set the **Require Timestamp** value as *True*.
      - Set the **Require Digital Signature for Incoming Messages** value as *True.*
      - Set the **Require Encryption for Incoming Messages** value as *True.*
      - In the **KeyStore Type** field, enter *JKS*.
      - In the **File Location** field, enter the location of the .jks file. For example, c:\keystore\keystore.jks
      - In the **KeyStore Password** field, enter the password for the keystore file provided in keytool command.
      - In the **Private Key Alias** field, enter the alias name provided in keytool command.
      - In the **Private Key Password** field, enter the private key password for the keystore file provided in the keytool command.
      - If the encryption is on in Primavera Gateway, then NONCE and CREATED are included in the header for UserName Token authentication. To enable this:
      - Set the **NONCE** value as *True.*
      - Set the **CREATED** value as *True*.
4) After encryption is set, restart P6 Web Services.

Configuring Applications for Integration

In This Section

Configuring Gateway Settings

Use the **Settings** page to specify settings for the installed Gateway application. For example, specify the Help location, or the job timeout value in minutes.

> **Note**: The settings available in this dialog box may vary depending on the application connections that have been set up in Gateway.

To configure Gateway application settings:

1) Select ✂ and then select **Settings**.
2) Update the settings as necessary and select **Save** when finished.

   On the **General** tab:

   - **Help URL**: Enter the help system hosted by Oracle as *http://docs.oracle.com/cd/F37377_01/help/en/index.htm.* By default the Help URL displays the most recently delivered version.
   - **Maximum number of job logs to display per page**: Enter a value to control the number of logs displayed on the Monitoring page. By default displays 25 job logs.
   - **Auto delete jobs after XX days (0 turns off auto delete)**: Enter the number of days that a job log can be retained before it is auto deleted. Enter 0 to turn off auto delete. By default, displays 30 for new customers.
   - **Maximum wait time for the parallel load/convert steps to complete (in minutes):** Enter the number of minutes after which a synchronization job process is to be timed out. The job status of a timed-out synchronization is set to **Failed.** By default, the timeout is set to **30** minutes.
   - **Maximum concurrent jobs in a node:** Enter the maximum number of jobs that can be executed concurrently at a node. By default 4 jobs can be executed concurrently.
   - **Job polling Interval (in seconds):** Enter the wait time interval in seconds to check the database if there are new jobs to run. By default, the wait interval is set to 2 seconds.
   - **Job timeout value (in minutes)**: Enter the wait time interval in minutes to timeout a synchronization job. By default, the timeout is set to **300** minutes.

- **Maximum File Size Limit (in MB)**: Enter the maximum file size limit for uploading files from Gateway user interface or from external applications. The file size limit applies to all providers and all supported file formats: CSV, XML, XLS, and XLSX. By default, the maximum file size limit is set to 1024 MB.
- **Maximum job log size for XML format (in MB)**: Enter the maximum file size limit for job log size. Job log files over 10 MB (default) are saved in JSON format by default.
- **Enable Configurable Consent Forms**: Select this check box to display the **Consent Forms** tab on the Configuration page in Gateway. If you enable this option and then proceed to configure and enable specific consent forms, your users will need to give their consent to gain full access to specific features and functions of Gateway. By default, the check box is deselected.
- **Disable Logging For Jobs**: For integrations with Unifier, select this check box to improve performance with large sets of earned value management data. By default, the check box is deselected.
- **Enable Object Logging for Jobs**: Select this check box to disable the display of data at the object level in the **Data Details** tab of the **Monitoring** page, and improve performance.
- **Maximum wait time for GSL Custom Steps to Complete (in seconds)**: Enter the maximum wait time in seconds when processing a GSL custom step. By default, the wait time is set to *5* seconds.

If you choose to integrate with P6, enter the following information on the **P6** tab:

- **Create new resource code values during synchronization to P6**: Select this check box to enable the creation of new resource code values in the P6 EPPM resource code dictionary if these values do not already exist. By default, the check box is selected.
- **Create new project code values during synchronization to P6**: Select this check box to enable the creation of new project code values in the P6 EPPM project code dictionary if these values do not already exist. By default, the check box is selected.
- **Create new activity code values during synchronization to P6**: Select this check box to enable the creation of new global activity code values in the P6 EPPM activity code dictionary if these values do not already exist. By default, the check box is selected.
- **Include time zone when exporting from P6:** Select this check box to export P6 server time zone information along with P6 date and time fields. By default, this option is **not** selected, except for spread interval data in P6.

  Note: This time zone setting applies only for a Primavera Cloud - P6 integration.

  Send P6 Spread to Unifier as a file: Select this check box to improve the performance of job runs related to a P6 - Unifier synchronizations that include daily spread fields. The daily spread fields on the P6 side are packaged into a separate zip file and sent direct to Unifier bypassing Gateway, whereas all non-spread fields in the synchronization are sent to Unifier using Gateway. By default, the check box is deselected.

  When this check box is deselected, Gateway packages all fields, including the daily spread fields in the synchronization, and sends it to Unifier.

- **Update activity resource assignments when assigned UDF values match**: Enter the UDF code value that is assigned to resource assignments which you want to update during a synchronization. Use this to update the resource assignment with the matching UDF value when the assignment exists multiple times on an activity. By default no UDF value is set.
- **Maximum wait time for the summarizer to complete (in seconds)**: Enter the amount of time in seconds to wait for the summarizer to complete before a warning is given. By default the wait time is set for 120 seconds.
-

On the **Mail Configuration** tab:

- **SMTP Server**: Enter the SMTP server address of your email server.
- **Port Number**: Enter the port number of your email server.
- **Email Security**: Select the applicable email security type. Choices include, **SSL**, **TLS**, and **None**.
- **Email Address**: Enter the email address for the user who is to be notified for a specific status of synchronization jobs. These statuses include: *Completed*, *Review*, *Cancelled*, *Completed with Errors*, *Completed with Warnings*, and *Failed*.
- **Authorized User**: Enter the user name for this email account.
- **Password**: Enter the password for the authorized user.
- **Bounce Email Address**: Enter an alternate email address to be used if mail fails to be delivered to the first email address.

On the **Server** tab:

- **Server Log Detail Level**: From th list, select the type of detailed information to be included in the server log file. Choices include:
  - **Error** (default): Select this value to display application errors in the log file.
  - **Info**: Select this value to display a brief description in the log file.
  - **Debug**: Select this value to display a general debugging event.
  - **Off**: Select this value to not generate any server log details.

Adding or Editing an EnterpriseTrack Deployment Connection

To move data between applications, Primavera Gateway needs to know where to get and send information. If you choose to integrate with Oracle Instantis EnterpriseTrack, add an application deployment connection for Oracle Instantis EnterpriseTrack by specifying an **Endpoint** URL.

For Oracle Instantis EnterpriseTrack Cloud service, contact Oracle Support to:

- add one or more Oracle Instantis EnterpriseTrack deployments
- copy an existing Oracle Instantis EnterpriseTrack deployment

For on-premises installations, add or edit an Oracle Instantis EnterpriseTrack deployment connection as follows:

1) Enter the Primavera Gateway URL in the format:
   http://<host name>:<port number>/gateway

Where, <host name> and <port number> should match those of your Primavera Gateway domain.

2) Sign in to Primavera Gateway with administration credentials.
3) In the sidebar, select **Configuration**.
4) Select the **Deployments** tab.
5) Select + **Add...** or ✎ **Edit...**to invoke the **Deployment** wizard.
6) In the **General** step, select *EnterpriseTrack* from the **Select Application Provider** list, and name the deployment.
7) In the **Deployment** step, set up EnterpriseTrack connectivity from Gateway as follows:
   - **EnterpriseTrack Login ID:** Enter the login ID that has all the necessary permissions to update project attributes. Otherwise, project import may fail.
   - **EnterpriseTrack Password:** Enter the password of the EnterpriseTrack user.
   - **EnterpriseTrack Login URL:** Enter the URL for accessing the application in the format: *http://<server_name>/SiteWand/Submission/<accountname>*
   - **EnterpriseTrack Initiative:** Enter a valid initiative to create or update a project.
   - **Date Format:** Enter a valid date format supported in EnterpriseTrack.
   - **EnterpriseTrack Connector Debug Flag:** Set the flag value to *Y* if you want to enable debugging generate a log file.
8) Select **Test Connection** ensure connectivity with Gateway is established.
9) Select **Save**.

Tips

- You can also edit a deployment and select **Save** in any step to exit the wizard.

Adding or Editing a MSP Provider Deployment Connection

Add a MSP provider deployment as follows:

1) Sign in to Primavera Gateway with administrator credentials.
2) In the sidebar, select **Configuration**.
3) Select the **Deployments** tab.
4) Select + **Add...** or ✎ **Edit...** to invoke the **Deployment** wizard.
5) In the **General** step, select *MSP* from the **Select Application Provider** list, and name the deployment.
6) In the **Deployment** step, set up the data source as follows:
   a. **MSP File Format**: *XML* is selected by default.
   b. **MSP File Data Source Type**: Select any of the following methods to upload the MSP file in XML format.

      To upload the MSP file from your local machine:
      - **File Data Source Type**: Select *File Upload* from the list**.**

      (On-premises only) To upload the MSP file from a Gateway server:
      - **File Data Source Type:** Select *File Path* from the list**.**

- **Shared Folder on the Gateway Server**: Enter the file path and folder location of the data file. For example, *C:\gateway\file.*

To upload an MSP file from an FTP server, enter the following server connection details:

- **File Data Source Type**: Select *FTPService* from the list**.**
- **FTP File Transfer Protocol**: Select select *FTP* or *SFTP*.
- **FTP Service User Name**: Enter the user name to sign in to the FTP service.
- **FTP Service Password**: Enter the password of the FTP user.
- **FTP Server Host**:Enter the server hosting the FTP service.
- **FTP Server Port Number**: Enter the port number associated with the FTP server.
- **FTP Server Folder Path**: Enter the default folder location on the FTP server that will contain the XML file.

To upload an MSP file using REST API, enter the following rest service connection details:

- **File Data Source Type** field, select *RestService***.**
- **Rest Service User Name:** Enter the user name to sign in to the REST service.
- **Rest Service Password**: Enter the password of the REST service user.
- **Rest Service URL**: Enter the URL address of the REST service.

Note: *RestService* only supports XML file format.

c. **Enable Cross Reference Tracking**:

d. **Include All Primavera Cloud Workspaces**:

7) Select **Test Connection** to ensure connectivity with the source or destination application.
8) Select **Save**.

Adding or Editing a P6 Deployment Connection

To move data between applications, Primavera Gateway needs to know where to get and send information. Set this up by adding application deployment connections by specifying an **Endpoint** URL for each application.

P6 Cloud Service

For P6 cloud service, contact Oracle Support to:

- add one or more P6 deployments
- copy an existing P6 deployment

P6 On-Premises Installations

For on-premises installations, add or edit a P6 deployment connection as follows:

1) Enter the Primavera Gateway URL in the format:
   http://<host name>:<port>/gateway
   Where, <host name> and <port> should match those of your Primavera Gateway domain.
2) Sign in to Primavera Gateway with administration credentials.

3) In the sidebar, select **Configuration**.
4) Select the **Deployments** tab.
5) Select + **Add...** or ✎ **Edit...**.
   The **Deployment** wizard displays.
6) In the **General** step, select **P6** from the **Select Application Provider** list, and name the deployment.

> **Note:** Select **Next** on each screen to advance to the next step.

7) In the **Deployment** step, set up P6 connectivity from Gateway:
   - **P6 Webservices authentication type:** Select any of the following authentication types.
     - *SAML2.0 Token* or
     - *UserName Token*
     - *OAuth*
   - **User Name**: Enter the name of a P6 administrator with access to projects in P6 EPPM.
   - **Password**: If you chose *UserName Token* authentication, enter the case-sensitive password of the P6 administrator.

     Endpoint: Enter the URL to connect with P6 Web Services in the format, *http:<host name>:<port>/p6ws/services/SyncServiceV1*
   - **P6 Database Instance ID:** Enter the database instance ID associated with the P6 application.
   - **SAML 2.0 Token File:** If you chose *SAML2.0 Token* authentication, then browse or enter the location of the downloaded SAML 2.0 token XML file used by P6 Web Services for authentication.
   - If you chose *UserName Token* or *SAML2.0 Token* authentication, then enter the following information:
     - **Enable Encryption:** Select this option if you want to enable encryption when using P6 web services.
     - **Keystore File:** Enter or **Browse...** to the keystore file.

       For more details on how to generate a keystore file and keystore password, see ***Enabling Encryption Between Gateway and P6 Web Services for On-Premises*** (on page 10).
     - **Keystore Password:** Enter the password for the keystore file.
     - **Certificate Alias:** Enter the certificate alias used for authentication.
   - **P6 Currency:** Enter the base currency for the P6 deployment.
8) Select **Test Connection** to ensure connectivity with P6 is established.
9) Select **Save**.

Tips

- You can also edit a deployment and select **Save** in any step to exit the wizard.

Adding or Copying a Primavera Cloud Deployment Connection

To move data between applications, Primavera Gateway needs to know where to get and send information. Set this up by adding application deployment connections by specifying an **Endpoint** URL for each application.

For Primavera Cloud service, contact Oracle Support to:

- add a new Primavera Cloud deployment
- copy an existing Primavera Cloud deployment

Adding or Editing a Unifier Deployment Connection

To move data between applications, Primavera Gateway needs to know where to get and send information. You set this up by adding application deployment connections by specifying an **Endpoint** URL for each application.

For Unifier Cloud service, contact Oracle Support to:

- add one or more Unifier deployments
- copy an existing Unifier deployment

For on-premises Unifier installations, add or edit a Unifier deployment connection as follows:

1) Sign in to Primavera Gateway with administration credentials.
2) In the sidebar, select **Configuration**.
3) Select the **Deployments** tab.
4) Select + **Add...** or ✎ **Edit...** to invoke the **Deployment** wizard.
5) In the **General** step, select *Unifier* from the **Select Application Provider** list, and name the deployment.
6) In the **Deployment** step, set up Unifier connectivity from Gateway:
7) In the **Unifier authentication type** list, choose *Basic* or *OAuth*.

   If you chose *Basic* authentication, enter the following information

   - **Short Name:** Enter the short name of the company used in Unifier.
   - **Authentication Code:** Enter the authentication code to use when data is integrated with Unifier from external systems using web services.
   - **End Point URL:** Enter the URL to connect with Unifier application in the format: *http://<host name>:<port>*

   If you chose *OAuth* authentication, enter the following information:

   - **User Name**: Enter the name of a Unifier administrator with access to projects in Unifier.
   - **Password**: If you chose *OAuth* authentication, enter the case-sensitive password of the Unifier administrator.
   - **End Point URL:** Enter the URL to connect with Unifier application in the format: *http://<host name>:<port>*
8) Select **Test Connection** to ensure connectivity with Unifier is established.
9) Select **Save**.

Tips

- You can also edit a deployment and select **Save** in any step to exit the wizard.

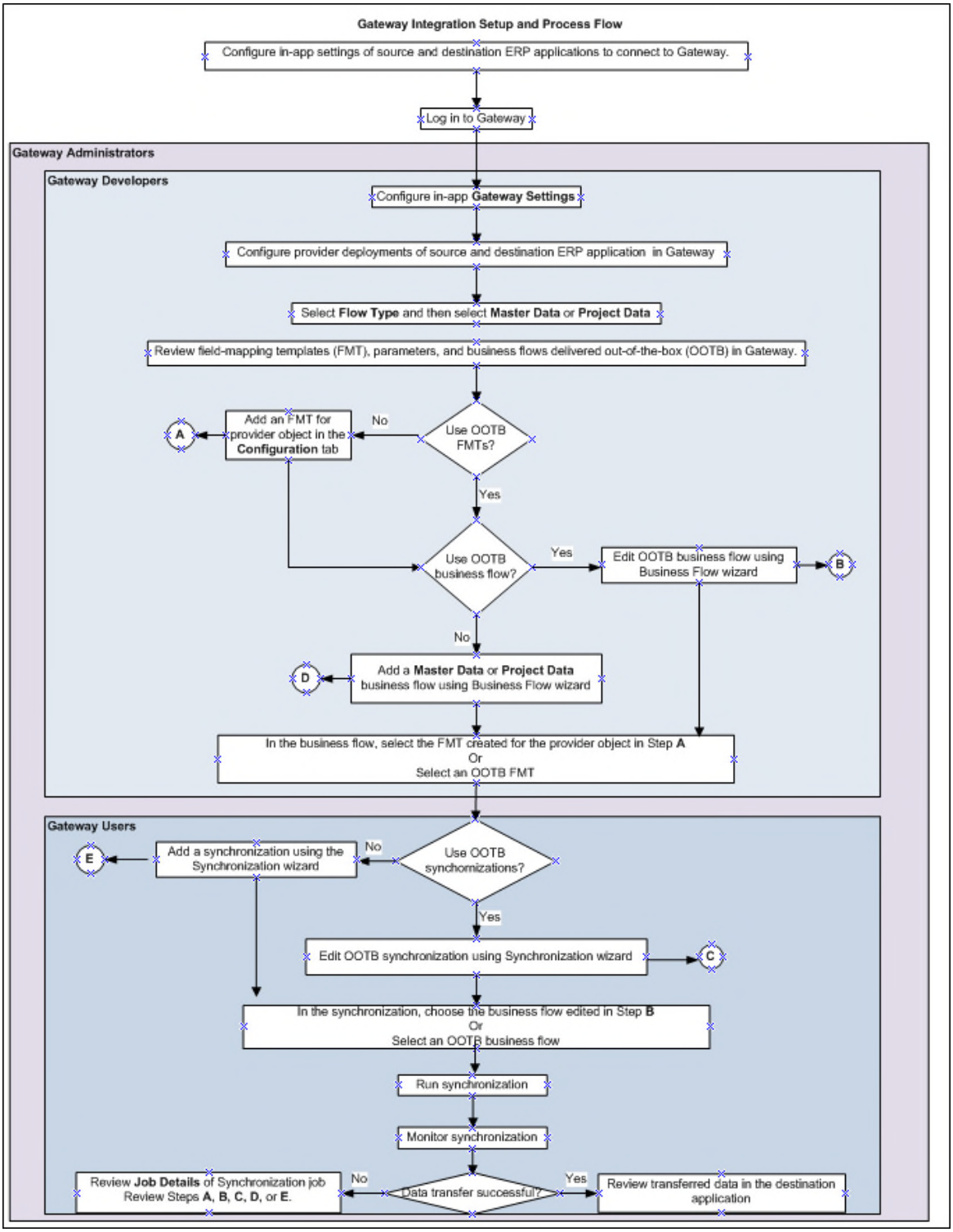
Gateway Setup and Data Transfer Process Flow

This process flow provides a visual outline of key decision points you will need to make when setting up an integration between any two ERP applications, using Gateway. Use this process flow in conjunction with chapters in this guide as well as the detailed examples provided in *Gateway Online Help*.

To troubleshoot issues when transferring data encountered in:

- Step A of the process flow, refer to the procedures in the chapter, *Working with Field Mapping Templates*.
- Step B or D of the process flow, refer to the procedures in the chapter, *Defining Business Flows*.

- Step C or E of the process flow, refer to the procedures in the chapter, *Defining Synchronizations*.



Working with Data Dictionaries

Gateway contains a data dictionary of objects and fields for each provider application and its corresponding native application it supports. Gateway developers and administrators can use these data dictionaries to review the list of objects and fields supported by each provider and then include relevant objects and fields when setting up a business flow to transfer data from a source application to a destination application.

This chapter describes:

- ***Features of Provider Data Dictionaries*** (on page 23)
- ***Editing Objects and Fields in Data Dictionaries*** (on page 26)
- ***Deleting Fields from Data Dictionaries*** (on page 28)

In This Section

Features of Provider Data Dictionaries

All providers extend complete or partial support for objects and fields that are dynamically created in an enterprise application. For example, when new business process objects and fields created in Unifier user interface, corresponding Gateway objects can be created within Unifier to support a Gateway integration. In Gateway, you can add and edit new objects and fields in File, Gateway, and Unifier data dictionaries corresponding to objects created in the native ERP application. All other provider data dictionaries allow you to only add, edit, and delete fields within a business object.

The following table outlines the features supported by each provider data dictionary.

	Provider Data Dictionaries						
Support	**Complete**			**Partial**			
Features	**Gateway**	**File**	**Unifier**	**Enterprise Track**	**MSP (on-premises only)**	**P6**	**Primavera Cloud**
Add Features at Object Level							
Add objects to data dictionary	Yes	Yes	Yes	No	No	No	No

	Provider Data Dictionaries						
Support	**Complete**			**Partial**			
Features	**Gateway**	**File**	**Unifier**	**Enterprise Track**	**MSP (on-premises only)**	**P6**	**Primavera Cloud**
Copy objects to data dictionary	Yes	Yes	Yes	No	No	No	No
Add fields to an object	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Add flow type (master or project) supported for an object	Yes	Yes	Yes	No	No	No	No
Add flow firection (source, destination, or both) for an object	Yes	Yes	Yes	No	No	No	No
Add cross-reference key mappings for an object	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Add Features at Field Level							
Add fields to an object	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edit Features at Object Level							
Edit object name and description	Yes	Yes	Yes	No	No	No	No
Edit fields supported by an object	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edit flow type (master or project) supported for an object	Yes	Yes	Yes	No	No	No	No

	Provider Data Dictionaries						
Support	**Complete**			**Partial**			
Features	**Gateway**	**File**	**Unifier**	**Enterprise Track**	**MSP (on-premises only)**	**P6**	**Primavera Cloud**
Edit flow direction (source, destination, or both) of an object	Yes	Yes	Yes	No	No	No	No
Edit cross-reference key mappings of an object	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edit Features at Field Level							
Edit fields supported by an object	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Delete Features at Object Level							
Delete objects	Yes	Yes	Yes	No	No	No	No
Delete fields supported by an object	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Delete flow type (master or project) supported for an object	Yes	Yes	Yes	No	No	No	No
Delete flow direction (source, destination, or both) of an object	Yes	Yes	Yes	No	No	No	No
Delete cross-reference key mappings of an object	Yes	Yes	Yes	Yes	Yes	Yes	Yes

	Provider Data Dictionaries						
Support	**Complete**			**Partial**			
Features	**Gateway**	**File**	**Unifier**	**Enterprise Track**	**MSP (on-premises only)**	**P6**	**Primavera Cloud**
Delete Features at Field Level							
Delete fields supported by an object	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Editing Objects and Fields in Data Dictionaries

Depending on the selected data dictionary, a business object in a data dictionary can be edited in two ways:

- Edit an object or
- Edit a field supported by an object

Editing an Object

Edit an object to update the name and description of the object, fields supported by an object, flows supported by an object or cross-reference keys of an object.

To edit an object:

1) In the sidebar, select **Data Dictionary.**
2) Select any of the following provider data dictionaries: **Gateway**, **File**, or **Unifier**.
3) Select the row listing the object you want to edit, and then select **Edit...** on the **Data Dictionary** page.

   The **Object and Fields** wizard displays.
4) If you edit an object in the Gateway, File, or Unifier data dictionaries, select the **General** step to edit the **Object Name Category**, and **Description** of the object.

   Otherwise select **Next**.

   > **Note:** Select **Next** on each screen to advance to the next step.

5) In the **Fields** step, add fields, or edit current fields supported by the business object:
   a. (Required) Enter a **Field Name** for the new field.
   b. In the **Field Type** field, select the data type of the field. Choices include: **Boolean, DateTime, Double, ForeignKey, Integer,** and **String**.

c. If you add a **ForeignKey** field, then select the **Join to Object** to join the new field with an existing object in that provider's dictionary.
d. Select **Read Only Field** to indicate the field value cannot be modified.
e. (Required) In the **Description** field, enter a short description of the object.
f. Select any of the following actions:
   - Select **Add** to add the field to the field table.
   - Select **Update** to edit an existing field in the field table.
   - Select **Reset** to undo all the changes made in the step.
   - Select **Delete** to delete a field from the field table.
g. Repeat this sequence in the **Fields** step to add multiple fields to a provider object.

6) If you edit an object in the Gateway, File, or Unifier data dictionaries, then select the **Flow Control** step. Select any of the following actions:
   - Select **Add** or **Edit** the **Flow Type** and **Flow Direction** combination to be associated with the provider object only.
   - Select **Delete** to delete an existing **Flow Type** and **Flow Direction** combination.
7) In the **Cross Reference** step, setup the cross-reference key field to be associated with the Gateway object.
   a. In the **Key Field** field, select the field to be used as the cross-reference key for the object in Gateway.
   b. In the **Gateway Objects** field, select the Gateway business object from the drop-down to map the cross-reference key of the provider object.

      Note: You can also map the provider object to a new Gateway object that has already been added using this procedure.

   c. Select any of the following actions:
      - Select **Add** to add the cross-reference key and Gateway object combination to the Key table.
      - Select **Delete** to delete a cross-reference and business object combination from the Key table.
8) In the **Summary** step, review a summary of all selections made.
   a. Expand each step title to review the selections made in that step.
   b. Select any of the following actions:
      - Select **Back** to navigate to a specific step and make changes.
      - Select **Save** toto confirm the changes made to the provider object.

      Note: See the *Gateway Online Help* for an example of editing at the object level.

Editing a Field Supported by an Object

A business object can support multiple fields. A business object can be edited to add additional fields, and edit, or delete existing fields supported by the object.

To edit a field within an object:

1) In the sidebar, select **Data Dictionary.**
2) Select a provider data dictionary. For example, *Primavera Cloud*.
   A list of objects supported in the data dictionary displays.
3) Select an object in the data dictionary. For example, *Currency*.
   A list of fields supported by the object displays.
4) Select **Edit...**.
   The **Object and Fields** wizard displays.
5) In the **General** step, select **Next**.

> **Note:** Select **Next** on each screen to advance to the next step.

6) In the **Fields** step, add fields, or edit current fields supported by the object:
   a. Enter a **Field Name** for the new field.
   b. In the **Field Type** field, select the data type of the field. Choices include: **Boolean, DateTime, Double, ForeignKey, Integer,** and **String**.
   c. If you add a **ForeignKey** field, then select the **Join to Object** to join the new field with an existing object in that provider's dictionary.
   d. Select **Read Only Field** to indicate the field value cannot be modified.
   e. Select any of the following actions:
      - Select **Add** to add the field to the field table.
      - Select **Reset** to undo all the changes made in the step.
      - Select **Delete** to delete an existing field from the field table.
   f. Repeat this sequence in the **Fields** step to add multiple fields to a provider object.
7) In the **Flow Control**, and **Cross Reference** steps, select **Next**.
8) In the **Summary** step, review a summary of all selections made.
   a. Expand each step title to review the selections made in that step.
   b. Select any of the following actions:
      - Select **Back** to navigate to a specific step and make changes.
      - Select **Save** to confirm the changes made to the provider object.

Deleting Fields from Data Dictionaries

Fields can be deleted as follows:

1) In the sidebar, select **Data Dictionary,** and select a provider data dictionary.
2) In the **Business Object** column, select an object in the data dictionary.
3) Select the row listing the field you want to delete.
4) Select the **Actions** menu and then select **Delete.**

> **Note:** If the field is associated with a field mapping template, then the field will be deleted from all mapping templates.

5) In the **Confirmation** dialog box, select **Confirm** to delete the field.

Working with Field Mapping Templates

A field mapping template contains a specific combination of objects and fields that will be selected in the source application when a business flow is picked up by a synchronization in Gateway. A business flow can include more than field mapping template. Using the data dictionaries, Gateway developers and administrators can add, edit, copy, view or delete field mapping templates to include specific objects and fields in the template. This in turn would include specific objects and fields that get selected in the source application.

This chapter describes how to use field mapping templates in Gateway.

In This Section

Adding or Editing Field Mapping Templates

Field mapping templates are used by master data and project data business flows to transfer data between any two applications supported by Primavera Gateway.

A field mapping template contains a list of business objects and fields that are to be transferred from the source application to the destination application. It also contains information on how each source business object and a destination business object is mapped with a corresponding Gateway business object. The field-mapping templates determine how a Gateway object, and the corresponding provider object with its supported fields are used in a business flow.

A business flow is a combination of a specific set of field mapping templates that fulfill a data transfer requirement. To create a business flow that processes specific data between any two applications, appropriate field-mapping templates must be created and included in a business flow to support data transfer in a business flow.

Gateway delivers field-mapping templates for Gateway objects that can be used in business flows. Alternatively, you can also create additional field-mapping templates to suit your requirements.

> **Note**: Field-mapping templates can be created using Groovy code or the canonical format (Direct) format of Gateway.

To add or edit field mapping templates:

1) In the sidebar, select **Configuration** and then select the **Field Mapping Templates** tab.
2) Select a Gateway business object from the drop-down.

   All field-mapping templates associated with the Gateway business object display in the field-mapping template table.

3) To add a field-mapping template, select + **Add...**.

   or

   In the **Field Mapping Name** column, select a field mapping template and then select ✎ **Edit...**.

4) In the **General** step:
   a. In the **Template Name** field, enter a name for the field mapping template.

      This is the only field that can be changed if you choose to edit a field mapping template.
   b. Select the type of template being created from the **Template Type** list.
      - Select **Groovy** if the template will use Groovy code.
      - Select **Direct** if the template will use the canonical format of Gateway.
   c. Select a provider from the **Provider 1** list.
   d. Select a provider from the **Provider 2** list.
   e. Select the object to be supported by the field mapping template from the **Provider 1 Object** list.
   f. Select the object to be supported by the field mapping template from the **Provider 2 Object** list.
   g. (Optional) Select **Use Criteria Step** to set a specific condition to filter data within the field-mapping template.

> **Note:** Select **Next** on each screen to advance to the next step.

5) In the **Criteria** step, specify the condition for field mappings:
   a. Select the field from the **Fields** list of **Provider 1**.
   b. Select the field from the **Fields** list of **Provider 2**.
   c. Enter the **Conditions** to be satisfied by **Provider1** and **Provider 2** fields respectively.
   d. Select **Validate Condition** to validate the syntax entered in the **Condition** text box for the provider fields.
6) In the **Mappings** step, specify field mappings supported by the template:
   a. Select **Auto Generate** to generate mappings for fields that are common to both providers and Gateway.

      For identical fields existing in both providers and Gateway, field mapping names are auto-suggested and populated for each provider.
   b. Specify additional field mappings as follows:
      1. Select the fields supported by the template in the list of both providers, and **Gateway**.
      2. Select **Add**.
      3. Repeat Step b to add multiple fields.
7) In the **Summary** step:
   a. Review all the selections made in the previous steps.
   b. Select any of the following actions:
      - Select **Back** to navigate to a specific step and make changes.
      - Select **Save** to add the field-mapping template.

> **Note:** Multiple provider objects can be mapped to a single provider object. For example, when you select *Sample* as **Provider 1** and *P6* as **Provider 2**, both objects in the Sample provider, **WorkOrder** and **WBS**, map to the **WBS** object in P6 EPPM.

Copying Field Mapping Templates

Copy a field-mapping template if you want to maintain similar versions of an existing template that can be used for different purposes within a specific integration scenario.

> **Note**: Providers and provider objects cannot be changed when a template is copied or edited.

To copy a field-mapping template:

1) In the sidebar, select **Configuration** and then select the **Field Mapping Templates** tab.
2) In the **Field Mapping Templates** section, select a Gateway object from the **Select Business Object** list.

   A master list of all mapping templates supporting the Gateway business object across all integrations displays.
3) In the **Field Mapping Name** column, select a template that you want to copy, select the **Actions** ▼ menu, and then select **Copy.**

   The **Template** wizard displays a copy of the selected mapping template.

Editing the Copied Template

Edit the copied template as follows:

1) In the **General** step, rename the template and select **Next**.

   > **Note:** Select **Next** on each screen to advance to the next step.

2) In the **Mappings** step, select the field that is to be supported as follows:
   a. Select the field to be supported in the data dictionary of the providers selected as **Provider 1** and **Provider 2**, and **Gateway**, and then select **Add**.
   b. (Optional) Select field-mappings that need not be supported and then select **Delete**.
3) In the **Summary** step, review all the selections made in the previous steps:
   a. Expand each step title to review the selections made in that step.
   b. Select any of the following actions:
      - Select **Back** to navigate to a specific step and make changes.
      - Select **Save** to add the provider object to the data dictionary.

   The mapping template can now be used in a business flow.

For a detailed example, see *Gateway Help*.

Viewing Field Mapping Templates

View field mapping templates for objects to determine whether you would need to create a new field mapping template or edit a field mapping template as follows:

1) In the sidebar, select **Configuration** and then select the **Field Mapping Templates** tab.
2) In the **Field Mapping Templates** section, select a Gateway object from the **Select Business Object** list.

A list of all field mapping templates associated with the selected Gateway business object displays.

Deleting Field Mapping Templates

Before deleting a field mapping template, ensure the following:

- Review all business flows using the field mapping template you plan to delete.
- Use the business flow wizard to deselect the field mapping template from all business flows.

Delete mapping templates as follows:

1) In the sidebar, select **Configuration** and then select the **Field Mapping Templates** tab.
2) From the **Select Business Object** list, select the business object associated with the field mapping template you want to delete.
3) In the **Field Mapping Name** column, select the mapping template you want to delete, select the **Actions** ▼ menu, and then select **Delete.**
4) In the **Confirmation** dialog box, select **Confirm**.

Working with Business Flows

To transfer data between applications, you first need to define business flows. These business flows will then be used to set up synchronization jobs in Gateway that execute the data transfer. For each business flow you must determine the following:

- What data will move between application deployments?
- What is the default role of each provider?
- What common business objects exist between the applications?

You can either use the out-of-the-box business flows delivered in Gateway or create new business flows if these don't fit your needs. Both options are outlined in detail. You can create multiple business flows.

In This Section

Adding Business Flows

You will need to create your business flows to send project data from an MSP file to Primavera Cloud.

To add a project data business flow in Primavera Gateway:

1) In the sidebar, select **Flow Type.**
2) Select **Project Data**.

   This flow type transfers project data between any two applications or between two distinct deployments of the same application.

   > **Note**: Only project data flow is supported by the MSP provider in Gateway.

3) Select the **Business Flows** tab.
4) Select + **Add...**.
5) In the **General** step of the **Business Flow** wizard:
   a. Select the source application from the **Source** list.
   b. Select the destination application from the **Destination** list.
   c. In the **Business Flow Name** field, enter or edit the name for the business flow.

d. (Optional) Select the **Compare Flag** check box if you want to send only those objects and fields to the destination application that have been added or updated since the last synchronization was run.

e. (Optional) Select the **Use Custom Steps** check box if you have added the following types of custom steps:

- (On-premises only) Internal Java custom steps
- External Java custom steps using the **Customization SDK**
- Custom Steps using Gateway Scripting Language

If you subsequently choose to not use custom steps in your business flow, the following warning message displays when you deselect this option: *Deselecting the Use Custom Steps option will remove all custom steps already included in the job run sequence. Select Cancel to include the Use Custom Steps option.*

f. In the **Description** field, enter a short explanation and use of the business flow.

> **Note:** Select **Next** on each screen to advance to the next step.

6) In the **Mappings** step:

a. Select the **Gateway Object Name** and the **Field-Mapping Name** for each object to be supported in the business flow.

b. In the **Applied For** field, select the type of action that will be performed for each object:

- *Create*: Creates new values
- *Update*: Updates existing values
- *Both*: Create and update values

> **Note**: You can also add a new field-mapping template for a business object in the **Customization** tab, and then select it in the **Mappings** step.

7) In the **Source App Parameters** step, select the source field values, if any, and the attributes of the source parameters.

8) In the **Destination App Parameters** step, select the destination field values, and the attributes of the destination parameters.

9) (Optional) In the **Custom Steps** step, select the custom steps that have been created.

10) In the **Summary** step, review a summary of all the selections made in the previous steps:

a. Expand each step title to review the selections made in that step.

b. Select any of the following actions:

- Select **Back** to navigate to a specific step and make changes.
- Select **Save.**

The business flow can now be used in a synchronization.

Copying Business Flows

When you need to create a new business flow similar to an existing flow, copy the current business flow and then edit as needed.

To copy a business flow:

1) In the sidebar, expand the **Flow Type** menu and then select **Master Data** or **Project Data**.
2) In the **Name** column, select the business flow you want to copy, select the **Actions** ▼ menu and then select **Copy**.

   The **Business Flow** wizard displays a copy of the current business flow with the word *Copy*. For example, *Send Unifier Roles to P6 Copy.*
3) In the **General** step, rename the business flow and select **Next**.

> **Note:** Select **Next** on each screen to advance to the next step.

4) In the **Mappings** step, for each business object to be supported in the business flow:
   a. Select the **Gateway Object Name** and the **Field Mapping Name**.
   b. Select any of the following actions from the **Applied For** list:
   - *Create*: Creates new values
   - *Update*: Updates existing values
   - *Both*: Create and update values

> **Note**: You can also add a new field mapping template for a business object in the **Customization** tab, and then select it in the **Mappings** step.

5) In the **Source App Parameters** step, select the source field values, if any, and the attributes of the source parameters.
6) In the **Destination App Parameters** step, select the destination field values, and the behavior of the destination parameters.
7) In the **Summary** step, review all the selections made in the previous steps:
   a. Expand each step title to review the selections made in that step.
   b. Select any of the following actions:
      - Select **Back** to navigate to a specific step and make changes.
      - Select **Save** to add the duplicated business flow.

Deleting Business Flows

To delete a business flow:

1) Sign in to Gateway as a developer or an administrator.
2) In the sidebar, expand the **Flow Type** menu, and then select **Master Data, Project Data** or **Migration Data**.
3) Select the row listing the business flow you want to delete, and then select **Delete** from the **Actions** ▼ menu.

4) In the **Confirmation** dialog box, select **Confirm**.

Executing a Business Flow

A business flow is executed as a distinct sequence of flow steps. Each flow step executes a specific action within a flow. For example, the **Load** step loads data from the source application.

The flow step sequence of a business flow can be modified by adding additional custom steps to the sequence. Primavera Gateway allows you to create custom steps through various methods. This section describes the flow step sequence used in each type of business flow.

The following types of flow steps are used in any Gateway business flow:

- Load

  This step loads the source data and passes it on to the next step.
- Convert

  This step converts the source data to the Gateway data structure or Gateway data structure to the destination data structure.
- Compare

  This step compares the source and destination data and identifies changed, deleted, and added objects so that the system can synchronize the data efficiently.

  To ensure that the data follows the same structure when it is compared, both the source and the destination data must be converted to the Gateway format before it can be compared. When identifying objects that are deleted in the source data, the compare step uses the cross reference table to determine whether the data has been synchronized in the past, the presence of the data in the cross reference table indicates that the data has been synchronized in the past. During the Compare step, the system marks objects that have been deleted in the source data for deletion in the destination system only if the record is in the cross reference table and a delete parameter is associated with the flow.

  This step compares the source and destination data and identifies the delta or differences for the next step.
- Review

  (Optional) This step enables you to review the source data before updating the data in the destination application.
- Update

  This step saves the data into the destination system.
- (Optional) External Custom Step

  This step loads the external custom step if defined for a data flow specific to an integration. The external custom step can be added anywhere in the above flow sequence.

Flow Step Sequence in a Project Data Business Flow

The Project data business flow is used to transfer project data between two applications or between *two distinct deployments* of the same application. For example, to transfer project data from a *P6 Testing environment to P6 production environment*.

The flow step sequence in a project data business flow is organized as follows:

- **Load from Source:** This step loads the project data from the source application into the Gateway framework so that it can be processed.
- **Convert from Source to Gateway Format:** This step converts the source project data from the source format to the Gateway format.
- (Optional) **Load from Destination:** This step loads the project data from the destination application into the Gateway framework so that it can be processed.
- (Optional) **Convert from Destination to Gateway Format:** This step converts the destination project data to the Gateway format.
- (Optional) **Compare Project Data:** This step compares the converted source Gateway data with the destination Gateway data. This step compares each object and uses the following rules to determine how the data is synchronized in the **Update Destination** step.
  - If the data is in the source object but not in the destination object, the data is created in the destination object during the **Update Destination** step.
  - If the data is in the destination object but not in the source node, the system performs the following steps:

    * Inspects the cross reference tables to determine whether the data has ever been synchronized.

    * Determines whether the Delete parameter has been set for the flow.

    If the data is in the cross-reference tables and the delete parameter has been set for the flow, the data is deleted from the destination during the **Update Destination** step. Otherwise, the data is not deleted in the **Update Destination** step.
  - Objects that contain updated data are marked for synchronization.
  - Objects that contain the same data in both the source and the destination nodes are ignored.
- **Convert to Destination Format:** This step converts the project data from Gateway format to the destination format.
- (Optional) **Review data:** This step enables you to review the source data before updating the data in the destination application.
- **Update Destination:** This step saves the project data into the destination application's database.

Flow Step Sequence for Compare Step in Business Flows

A flow that supports a **Compare** step loads the project from both sides, determines the delta between each side, and uses only the difference to synchronize the data during the final update.

Unlike the normal flow that consists of four steps (load, convert to Gateway, convert from Gateway, and Update Destination), a flow that supports the Compare step includes the following additional steps:

- Load data from the other application
- Convert the data to the Gateway format
- Compare

The Compare step is supported by the Gateway framework code; providers do not have to implement it. Providers will need to implement the extra load and convert steps as these must be implemented by the provider of the destination application. The destination provider must ask for the key of the project that is being loaded to the source side of the implementation when supporting the compare functionality.

Source Provider

In the project data flow, the source provider needs to communicate to the destination side which project it is loading when the Primavera Gateway loads the initial project data from the source side. To do that, the source provider must implement the **getProjectKeyForCompare** method in the **FlowProvider** interface.

Normally, a provider will determine which project it is to load from the filter or the parameters that users set in the Gateway user interface. The implementation of the method needs to return a Gateway side value of this project key.

The following is a sample code snippet from the Project Data flow in **SampleProvider.java**:

```
	@Override
	public Map<String, String> getProjectKeyForCompare(String flowType, FlowContext context)
throws ProviderException {
		SampleFlowType type = getFlowType(flowType);
		switch (type) {
		case SyncProjectImport:
			String sampleProjectKey = (String) context.getParameter("ImportProjectId");
			if (StringUtils.isEmpty(sampleProjectKey)) {
				return null;
			} else {
				Map<String, String> keyMap = new HashMap<String, String>();
				keyMap.put("ObjectId", context.getXRefValueByGuest("Project",
sampleProjectKey));
				keyMap.put("Id", sampleProjectKey);
				return keyMap;
			}
		default:
			throw new UnsupportedOperationException("Compare not supported.");
		}
	}
```

Destination Provider

Similarly, in the project data flow, the destination provider needs to ask for the project key so that it can load the same project. To do that, the destination provider must implement the methods in the **LoadStepContext** interface.

The LoadStepContext interface has two methods for this use case:

- **isLoadStepForCompare** method can tell you whether this load step is invoked as a companion load step for the Compare mechanism.
- **getProjectKeyForCompare** method can tell you which project you should load. The project key returned by **getProjectKeyForCompare** is already a destination side value.

The following is a code snippet from the Project Data flow in **ProjectLoadStep** of the Sample provider:

```
if (context.isLoadStepForCompare()) {
        Map<String, String> projectKeys = context.getProjectKeyForCompare();
                String projectId = null;
                if (projectKeys != null) {
                        String objectId = projectKeys.get("ObjectId");
                        if (StringUtils.isEmpty(objectId)) {
                                projectId = projectKeys.get("Id");
                        } else {
                                projectId = objectId;
                        }
                }
                if ((projectId == null) || projectId.isEmpty()) {
                        return new PDIDocumentImpl();
                } else {
                        return getOneProject(projectId, context);
                }
        }
```

Flow Step Sequence for External Java Custom Steps in Business Flows

An external custom step can be used in a project data or master data flow, and can be limited to an integration between specific provider applications. For example, you would use a project data flow with an external custom step to transfer project data from a Sample to File integration.

The flow step sequence for external Java custom steps can be organized as follows:

- **Load from Source:** This step loads the data from the source application into the Gateway framework so that it can be processed.
- **(Optional) <External Custom Step Name>:** This step can be used anywhere in the flow sequence. In this case, this step loads the external custom step to the source data.

  For more details on how to create an external custom step, download the External Custom Step SDK from the ⓘ **Help** menu in Gateway.
- **Convert from Source to Gateway Format:** This step converts the source data to the Gateway format.
- **Convert to Destination Format:** This step converts the data from Gateway format to the destination format.
- **(Optional) <External Custom Step Name>:** This step can be used anywhere in the flow sequence. In this case, this step loads the external custom step to the destination data.
- **Update Destination:** This step saves the data into the destination application's database.
- **(Optional) <External Custom Step Name>:** This step can be used anywhere in the flow sequence. In this case, this step loads the external custom step to the destination data.

Flow Step Sequence for Internal Java Custom Steps for On-Premises

An internal custom step can be used in a project data or master data flows, and can be limited to an integration between specific provider applications. Internal custom steps must be coded in Java and can be used anywhere in a flow step sequence. For example, use an internal custom step to transfer project data from a Sample to File integration.

The flow steps are organized as follows:

- **Load from Source:** This step loads the data from the source application into the Gateway framework so that it can be processed.
- **(Optional) <Internal Custom Step Name>:** This step can be used anywhere in the flow sequence. In this case, this step loads the internal custom step to the source data.
- **Convert from Source to Gateway Format:** This step converts the source data to the Gateway format.
- **Convert to Destination Format:** This step converts the data from Gateway format to the destination format.
- **(Optional) <Internal Custom Step Name>:** This step can be used anywhere in the flow sequence. In this case, this step loads the internal custom step to the destination data.
- **Update Destination:** This step saves the data into the destination application's database.
- **(Optional) <Internal Custom Step Name>:** This step can be used anywhere in the flow sequence. In this case, this step loads the internal custom step to the destination data.

Flow Step Sequence for Custom Steps in Gateway Scripting Language for Business Flows

For a specific provider, a custom step can be added to the flow step sequence of any business flow from within the Gateway user interface using Gateway scripting language. This flow step is an alternative option to:

- Adding a external custom step using Java
- Adding a internal custom step using Java

> **Note**: Gateway scripting language is distinct from *Groovy* Scripting Language. For more details on how to code a custom step, see *Gateway Scripting Language Guide*.

A business flow is executed as an ordered sequence of flow steps. So, the positioning of a custom step depends on the role of the provider in a business flow.

Use the following table to position a custom step in the default flow step sequence:

If Provider Role in Business Flow is...	Add Custom Step...
Source	with a sequence number in the range 1 - 19.
Destination	with a sequence number in the range 61 - 79.

You can also add a custom step in Gateway between sequence numbers 21 - 59.

The steps can then be organized as follows:

- (Optional for Source Provider) **<Custom Step Name>:** This step runs the custom step to the source data. It can be added in the flow sequence for a *source* provider with a sequence number in the range 1 - 9.
- **Load from Source:** This step loads the data from the source application into the Gateway framework so that it can be processed.

- (Optional for Source Provider) **<Custom Step Name>:** This step runs the custom step to the source data. It can be added in the flow sequence for a *source* provider with a sequence number in the range 11 - 19.
- (Optional in Gateway) **<Custom Step Name>:** This step runs the custom step within Gateway. It can be added in the Gateway flowside sequence with a sequence number in the range 21 - 59.
- **Convert from Source to Gateway Format:** This step converts the source data to the Gateway format.
- **Convert to Destination Format:** This step converts the data from Gateway format to the destination format.
- (Optional) **<Custom Step Name>:** This step runs the custom step to the destination data. It can be added in the flow sequence for a *destination* provider with a sequence number in the range 61 - 69.
- **Review data:** This step enables you to review the source data before updating the data in the destination application.
- (Optional) **<Custom Step Name>:** This step runs the custom step to the destination data. It can be added in the flow sequence for a *destination* provider with a sequence number in the range 71 - 79.
- **Update Destination:** This step saves the data into the database of the destination application.

> **Note**: Although custom steps can be added after the last **Update Destination** flow step (sequence number 80), these will not be processed by the business flow.

Using Business Flows Delivered in Gateway

To use business flows delivered in Gateway:

1) In the sidebar, select **Flow Type**.
2) Select **Project Data**.
   The **Project Data** page displays.
3) Select the **Business Flows** tab.
4) In the **Name** column, select a business flow delivered in Gateway.
5) Select **Edit...**.
   The **Business Flow** wizard displays.
6) Complete the steps in the wizard and select **Save**.

Using Project Data Flow Type

Use the **Project Data** flow type to transfer project data business objects identified in the ***Business Objects Supported in Project Data Flow*** (on page 44).

The following types of project data business flows are delivered for an integration between Primavera Cloud and Microsoft Project in Gateway:

- Export Primavera Cloud project data to MSP
- Import MSP project data to Primavera Cloud

> **Note:** When you are creating a business flow, and choosing the mapping templates for a object, you can mark a mapping template as **Create Only**, **Update Only** or **Both**. For project data business flows, if all the mapping templates are create-only templates, then update is not allowed.

Each business flow uses one or more field mapping templates that handle the data transfer of specific business objects and its corresponding fields. You can edit these delivered business flows or also create additional business flows and field mapping templates to fit your needs. After creating new business flows or editing the above business flows you can create synchronization jobs that use the defined project data business flows to transfer project data. For more details, see ***Working with Synchronizations*** (on page 51).

Business Objects Supported in Project Data Flow

The following business objects are supported between the Microsoft Project and Primavera Cloud in a **Project Data** flow type. These business objects can be transferred using the field mapping templates delivered in Gateway. To view a list of field mapping templates provided in Gateway, see ***Field Mapping Templates for Project Data Business Objects*** (on page 45).

When Microsoft Project is the *source* application, the following business objects are supported between MSP and Primavera Cloud applications in a project data flow:

MSP Source Business Objects	Gateway Business Objects	Primavera Cloud Destination Business Objects
Assignment	ResourceAssignment	ResourceAssignment
Calendar	Calendar	Calendar
Project	Project	Project
Rate	ResourceRate	ResourceRate
Relationship	Relationship	Relationship
Resource	Resource	Resource
SummaryTask	WBS	WBS
Task	Activity	Activity
UnitOfMeasure	UnitOfMeasure	UnitOfMeasure

When Primavera Cloud is the *source* provider, the following business objects are supported between Microsoft Project and Primavera Cloud applications in a project data flow:

Primavera Cloud Source Business Objects	Gateway Business Objects	MSP Destination Business Objects
Activity	Activity	Task
Calendar	Calendar	Calendar
ResourceAssignment	ResourceAssignment	Assignment
Project	Project	Project
ResourceRate	ResourceRate	Rate
Relationship	Relationship	Relationship
Resource	Resource	Resource
WBS	WBS	SummaryTask
UnitOfMeasure	UnitOfMeasure	UnitOfMeasure

Field Mapping Templates for Project Data Business Objects

Each business object can be supported by more than one field mapping template. You can edit the delivered business flows to include or exclude business objects by selecting the corresponding field mapping templates or also create your own if these templates don't fit your needs. Additional business objects can also be supported in the templates you choose to created.

Export Primavera Cloud project data to MSP Business Flow

The following field mapping templates are supported for each business object in the **Export Primavera Cloud project data to MSP** business flow:

Primavera Cloud Source Business Objects	Associated Field Mapping Template
Activity	Activity data for MSP and Primavera Cloud
Calendar	Calendar data from Primavera Cloud to MSP
Project	Project data from Primavera Cloud to MSP
Relationship	Relationship data for MSP and Primavera Cloud
Resource	Resource data from Primavera Cloud to MSP
ResourceAssignment	Resource Assignment data from Primavera Cloud to MSP
ResourceRate	Resource Rate data for MSP and Primavera Cloud

Primavera Cloud Source Business Objects	Associated Field Mapping Template
UnitOfMeasure	UnitOfMeasure data for MSP and Primavera Cloud
WBS	WBS data for MSP and Primavera Cloud

For a detailed list of fields supported in each field mapping template, see ***Appendix: Fields Supported in Project Data Mapping Templates*** (on page 63).

Import MSP project data to Primavera Cloud Business Flow

The following field mapping templates are supported for each business object in the **Import MSP project data to Primavera Cloud** business flow:

MSP Source Business Objects	Associated Field Mapping Templates
Assignment	ResourceAssignment data from MSP to Primavera Cloud
Calendar	Calendar data from MSP to Primavera Cloud
Project	Project data from MSP to Primavera Cloud
Rate	Resource Rate data for MSP and Primavera Cloud
Relationship	Relationship data for MSP and Primavera Cloud
Resource	Resource data from MSP to Primavera Cloud
SummaryTask	WBS data for MSP and Primavera Cloud
Task	Activity data for MSP and Primavera Cloud
UnitOfMeasure	Unit Of Measure data for MSP and Primavera Cloud

For a detailed list of fields supported in each field mapping template, see ***Appendix: Fields Supported in Project Data Mapping Templates*** (on page 63).

Setting Provider-Specific Parameters

Based on the role of MSP and Primavera Cloud providers and the data to be transferred in the business flow the following provider-specific parameters will display as either source or destination application parameters in the **Business Flow** wizard.

Users having the role of a Gateway administrator or Gateway developer can access and view all the parameters listed below. Set the behavior of these parameters in the business flow by specifying the **Attribute** for each as any of the following values: **Hidden, Optional, Read-only,** or **Required**.

Notes:

- Data identified by each parameter is processed by a flow step of the business flow. For more information on flow steps, see Appendix A: About Flow Steps.
- All values specified in the filter parameters will be used in the **Load** step of the flow for loading data from the providers designated as the source or the destination.

MSP Provider Application Parameters

When *Microsoft Project* is the *source* application, set values and attributes for the following parameters while adding or editing a project data business flow:

- **MSP File to Upload**

  Browse and select the Microsoft Project file to be used by the business flow. This option is enabled only if you chose to set up an **MSP** deployment with the **File Upload** option in the **Deployments** tab of the **Configuration** page.

- **MSP File Name**

  Enter the Microsoft Project file name to be uploaded by the business flow. This option is enabled only if you chose to set up an **MSP** deployment with **FilePath** or **FTPService** options in the **Deployments** tab of the **Configuration** page. This information is used in the **Load** step of the flow.

When *Microsoft Project* is the *destination* application, set values and attributes for the following parameters while adding or editing a project data business flow:

- **File Name**

  Enter the file name that is to be used to download the data by the MSP provider.

- **MSP File Version**

  Select the Microsoft Project version that the MSP provider will use to download the data.

- **Synchronize one project at a time**

  A synchronization job is usually split into multiple child jobs with each child job transferring data in each project. By default all child jobs are executed simultaneously. Use this setting to determine whether to synchronize data one project at a time.

- **Delete data that no longer exists in the source application?**

  Use this setting to determine whether data that no longer exists in the source application is to be deleted in the destination application. This parameter must be used in conjunction with the **Compare** flag selected in the **Business Flow** wizard.

  Note: When you run a project data flow, it will delete only project level data in a business flow, but not the master data. This will prevent you from deleting master data elements such as resources, roles etc., that may be used in another project. However, if used in a master data flow, it will delete all relevant objects and fields.

- **Only delete data that has been linked previously with the source application?**

To use this parameter, you must also select the parameter, **Delete data that no longer exists in the source application?** During a synchronization, when the data is compared between the source and the destination application, data that has been added only in the destination application will not be deleted. However, if you deleted source data that was previously synced in the destination application, it will also be deleted from the destination application.

- **Partition data to child jobs for large data transfers?**

  Use this setting if you are integrating large data sets between projects and between applications when P6 EPPM or Oracle Primavera Cloudis the source application. This parameter partitions large data sets logically into multiple child jobs.

- **Child job object limit for partitioned data**

  Use this setting in conjunction with the **Partition Data into Child Jobs?** parameter. Enter a limit on the number of objects that can be included in the child jobs in the range 50 - 5000. Zero (0) is the default value.

Primavera Cloud Provider Application Parameters

When *Primavera Cloud* is the *source* application, set values and attributes for the following parameters while adding or editing a project data business flow:

- **Primavera Cloud Project Filter**

  Use this setting to identify and select projects in Primavera Cloud using *Project Ids, Workspace Ids, Project Code Type Name, Project Code Value,* or *Project Status.*

  Select **Add Row** to enter multiple filter criteria for selecting projects.

  Select **Edit Row** to change the current filter criteria or value for selecting a project.

  Select **Delete Row** to delete a filter criteria.

When *Primavera Cloud* is the *destination* application, set values and attributes for the following parameters while adding or editing a project data business flow:

- **Workspace Location**

  Use this setting to specify the default workspace and populate it in a synchronization. If the value is set in Primavera Gateway, then Primavera Cloud will check if the **Primavera Cloud Workspace** field value exists and will use it to create the project.

  P6 must send all global data assigned to the project with the project flow. All global data will be assigned to the workspace where the project will be created in Primavera Cloud.

- **Primavera Cloud Location Filter**

  Use this setting to specify location values in Primavera Cloud using *CountryCode* or *WorkspaceId*. Select **Add Row** to enter multiple filter criteria for selecting location values. Select **Edit row** to change a current filter criteria or value for selecting a location.

- **Save data to Primavera Cloud if there are errors?**

  Use this setting to determine how data is to be processed when a job fails in Gateway. Select this option if you want to save the data in Primavera Cloud when a synchronization job fails in Gateway. Otherwise, deselect this option to ensure data is not saved in Primavera Cloud for failed jobs.

- **Synchronize one project at a time**

A synchronization job is usually split into multiple child jobs with each child job transferring data in each project. By default all child jobs are executed simultaneously. Use this setting to determine whether to synchronize data one project at a time.

- **Delete data that no longer exists in the source application?**

  Use this setting to determine whether data that no longer exists in the source application is to be deleted in the destination application. This parameter must be used in conjunction with the **Compare** flag selected in the **Business Flow** wizard.

  Note: When you run a project data flow, it will delete only project level data in a business flow, but not the master data. This will prevent you from deleting master data elements such as resources, roles etc., that may be used in another project. However, if used in a master data flow, it will delete all relevant objects and fields.

- **Only delete data that has been linked previously with the source application?**

  To use this parameter, you must also select the parameter, **Delete data that no longer exists in the source application?** During a synchronization, when the data is compared between the source and the destination application, data that has been added only in the destination application will not be deleted. However, if you deleted source data that was previously synced in the destination application, it will also be deleted from the destination application.

- **Partition data to child jobs for large data transfers?**

  Use this setting if you are integrating large data sets between projects and between applications when P6 EPPM or Oracle Primavera Cloudis the source application. This parameter partitions large data sets logically into multiple child jobs.

- **Child job object limit for partitioned data**

  Use this setting in conjunction with the **Partition Data into Child Jobs?** parameter. Enter a limit on the number of objects that can be included in the child jobs in the range 50 - 5000. Zero (0) is the default value.

Working with Synchronizations

A synchronization in Gateway is a job set up to run on-demand or on schedule to exchange data between the source and destination applications.

The business flows delivered or created in Gateway are used in synchronizations that perform the actual data transfers. For each business flow a corresponding synchronization needs to be created. You can either use the delivered synchronization or create new synchronizations if these don't fit your needs. Both options are outlined in detail.

The following synchronizations are delivered for an MSP - Primavera Cloud integration:

- Export Primavera Cloud project data to MSP
- Import MSP project data to Primavera Cloud

This chapter outlines synchronizations procedures in Gateway.

In This Section

Adding Synchronizations

After adding business flows or editing the out-of-the-box business flows you can add new synchronizations that use these business flows to transfer data between the applications using the **Synchronization** wizard. To transfer data between applications, you need to create and run a synchronization. You have the option to run the synchronization on demand, run based on the occurrence of specific events, or schedule it to run regularly at a time and date of your choosing.

Prerequisites

- Configure application deployment connections for the source and destination applications in the data flow.
- Business flows must be setup for the data transfer.
- If an integration supports master data, then synchronize the master data between applications before you synchronize project data. This will ensure that each deployment has the information necessary to synchronize project data.

Procedure

To transfer data between applications:

1) Sign in to Primavera Gateway as an administrator or a user.
2) In the sidebar, select **Synchronizations**, and then select + **Add...**.
3) Follow the steps in the **Synchronization** wizard to name and configure the synchronization.

> **Note**: If you edit a synchronization and change the business flow, then you must review and update the parameters as needed.

4) Select **Save** in any step of the wizard to save the changes and exit the wizard instantly.
5) Transfer data between applications using any of the following options:
   - To run a synchronization on-demand, highlight the synchronization and select **Run**.
   - To review the data that will be moved from the source application, highlight the synchronization and select the **Actions** ▼ menu and then select **Run with Review**.

> **Note:** If you are a user or administrator with *no* data access privileges, once a synchronization is **Run with Review**, you cannot review the actual data being transfered in each step of a job nor download the job details. When you select the **Review** link, an error message, *Insufficient Permissions*, is displayed.

   - (On-premises only) To schedule an event-based synchronization, highlight the synchronization, select the **Actions** ▼menu and then select **Run on Event**.

> **Note:** (On-premises only) You can set up an event-based synchronization using the delivered P6 event provider only if P6 is the source provider in the defined flow. To set up event-based synchronizations for any other provider you will need to develop an event provider for your provider. For more details, refer to the *Primavera Gateway Provider Development Guide*.

   - To schedule the synchronization to run at a certain date and time, or a specific sequence of synchronizations, select the synchronization, select the**Actions** ▼ menu and then select **Edit Schedule...**.
6) To delete a synchronization:
   a. Highlight the synchronization.
   b. Select the **Actions** ▼menu and then select **Delete**.
   c. Select **Yes** in the **Confirmation** dialog box.

The following videos showcase how to transfer data between applications:

- ***Send Basic Project Information from Primavera Cloud to P6*** (***https://players.brightcove.net/2985902027001/SyXjZnYeeb_default/index.html?videoId=6174408598001***)
- ***Send Basic Project Information from P6 to Primavera Cloud*** (***https://players.brightcove.net/2985902027001/SyXjZnYeeb_default/index.html?videoId=6174409131001***)
- ***Send P6 Schedule Data to Primavera Cloud*** (***https://players.brightcove.net/2985902027001/SyXjZnYeeb_default/index.html?videoId=6174410341001***)

- ***Send Lean Schedule Data from Primavera Cloud to P6*** (***https://players.brightcove.net/2985902027001/SyXjZnYeeb_default/index.html?videoId=6174412205001***)

Editing Synchronizations

Edit a synchronization if you want to rename a synchronization, change the business flow used by the synchronization, or modify the parameter values that are used to identify the data for the data transfer.

To edit a synchronization in Gateway:

1) In the sidebar, select **Synchronizations**.
2) Select the synchronization you want to edit, then select **Edit...**.
3) In the **Flow and Deployments** step of the synchronization wizard, edit any of the following information:
   a. In the **Synchronization Name** field, rename the synchronization.
   b. In the **Business Flow** field, select the business flow that is to be used by the synchronization.
   c. The source and destination for data transfer are pre-selected. Update only if necessary.

   Note: Select **Next** on each screen to advance to the next step.
4) In the **Parameters** step, edit the value of each parameter as needed.
5) In the **Summary** step, review a summary of all the selections made in the previous steps.
   Select any of the following actions:
   - Select **Back** to navigate to a specific step and make changes.
   - Select **Save** to add the synchronization.

The synchronization is now available for running on the **Synchronizations** page.

Copying Synchronizations

You can modify any delivered synchronization or a synchronization that you custom created in Gateway.

Note: Before you modify, it is recommended that you copy the synchronization and then edit the copy as needed.

To copy a synchronization in Gateway:

1) In the sidebar, select **Synchronizations**.
2) Select the synchronization you want to copy, then select the **Actions** menu and select **Copy**.
   The **Synchronization** wizard displays a copy of the current synchronization.
3) In the **Flow and Deployments** step:
   a. In the **Synchronization Name** field, rename the synchronization.

The default name of the duplicate synchronization is always created with the word, *Copy*. For example, *Send Primavera Cloud Project Data to P6 Copy*.

b. In the **Business Flow** field, select a business flow that is to be used by the synchronization.

> **Note:** Select **Next** on each screen to advance to the next step.

4) In the **Parameters** step, edit the value of each parameter as needed.
5) In the **Summary** step, review a summary of all the selections made in the previous steps.

Select any of the following actions:

- Select **Back** to navigate to a specific step and make changes.
- Select **Save** to add the synchronization.

The synchronization is now available for running and monitoring.

Deleting Synchronizations

To delete a synchronization:

1) In the sidebar, select **Synchronizations**.
2) In the **Synchronization Name** column, select the row listing the synchronization you want to delete.
3) Select the **Actions** ▼ and then select **Delete**.
4) In the **Confirmation** dialog box, select the **Confirm** button to delete.

> **Note**: When you delete a synchronization, all job logs associated with this synchronization will also be deleted.

Transferring Data between Applications

After you add, copy or edit a synchronization as needed, transfer data to the destination application as follows:

1) In the sidebar, select **Synchronizations**.
2) In the **Name** column, select the row containing the synchronization you want to execute.
3) Transfer data to the destination application using any of the following options:

Select **Run** to run a synchronization immediately.

In the **Actions** ▼ menu select any of the following options:

- Select **Run with Review** to review the source data before transferring it to the destination application.

> **Note:** If you are a user or administrator with *no* data access privileges, once a synchronization is **Run with Review**, you cannot review the actual data being transfered in each step of a job nor download the job details. When you select the **Review** link, an error message, *Insufficient Permissions*, is displayed.

- Select **Run on Event** to schedule an event-based synchronization. For more details, see ***Scheduling Run on Event Synchronizations*** (on page 55).
- Select **Edit Schedule...** to schedule and run synchronizations. For more details, see ***Scheduling Synchronizations*** (on page 56).

4) Proceed to monitor the synchronization. For more details see ***Monitoring Synchronizations*** (on page 59).

Scheduling Run on Event Synchronizations

A **Run on Event** synchronization is executed only when a specific event occurs in P6 EPPM, the source application. For example, a run-on-event synchronization executed only when a new activity is added to project ID PRJ001.

A run on event synchronization between Primavera Cloud and P6 EPPM can be executed only if:

- P6 EPPM, and Primavera Gateway are both installed on the cloud or, both installed on-premises
- Primavera Gateway and P6 EPPM are installed in the same domain
- P6 EPPM deployment in Primavera Gateway is set up with the P6 event provider. Contact support to complete this request. The event provider uses event listeners to monitor events in the P6 EPPM application.

> **Note**: (On-premises only) To set up event-based synchronizations for any other source application you will need to develop an event provider for your provider. For more details, refer to the *Primavera Gateway Provider Development Guide*.

- P6 EPPM is the source application in the synchronization job.

To schedule run on event synchronizations:

1) In the sidebar, select **Synchronizations**.
2) Select a synchronization job.
3) In the **Actions** ▼ menu, select **Run on Event**.
4) In the **Add Listener** wizard, select the event listener from the drop-down for the synchronization job.
5) Select **Save**.

   The synchronization job is now set to run for the event coded in the event listener.

Scheduling Synchronizations

Set up a synchronization schedule to run specific synchronizations on a frequent basis.

To schedule a synchronization in Gateway:

1) In the sidebar, select **Synchronizations**.
2) Select the synchronization you want to copy.
3) In the **Actions** ▼ menu, select **Edit Schedule...**.
4) In the **Recurrence Pattern** section, select the frequency of the synchronization.
   - From the **Frequency** list, select *Daily*, *Weekly*,*Monthly*, or *After Synchronization*.
   - Complete the additional fields which display for the selected frequency.

   Note: If you select *After Synchronization*, then you can schedule multiple synchronizations that run sequentially. For more details, see ***Scheduling Sequential Synchronizations*** (on page 56).
5) In the **Range of Recurrence** section, enter the duration of the synchronization being scheduled.
   a. In the **Starts** field, enter or select the start date and time of the synchronization schedule.
   b. In the **Ends** field, select any of the following options:
      - **No end date**: The synchronization schedule will run for the selected frequency until canceled manually.
      - **End after # occurrences**: The synchronization schedule will end after running a specific number of times for the selected frequency.
      - **End By**: Enter or select the end date and time of the synchronization schedule.
6) Select **Save**.

Scheduling Sequential Synchronizations

A synchronization job sequence is a sequence of synchronizations that are executed consecutively.

To schedule a synchronization job sequence:

1) In the sidebar, select **Synchronizations**.
2) In the **Synchronization Name** column, select the next or the final synchronization that is to be run in the job sequence.
3) In the **Actions** ▼ menu, select **Edit Schedule...**.
4) Select *After Synchronization* from the **Frequency** list.
5) Select the previous synchronization that is to be run in the sequence from the **Run After Synchronization** list.

   The previous synchronization must finish with a status of *Completed*, or *Completed with Warnings* to begin the next synchronization.

   If a synchronization fails to run, all subsequent linked synchronizations will not run in the job sequence.

6) Repeat the above sequence to set up multiple linked synchronizations in a sequence.
7) Select **Save**.
8) To view a flow chart of the linked synchronizations:
   a. In the **Synchronization Name** column, select the linked synchronization.
   b. In the **Actions** ▼ menu, select **Job Chain Diagram**.

> **Note**: This option is enabled only for a linked synchronization.

9) To run the job sequence:
   a. On the **Synchronizations** page, select the **Synchronization Name** that was last setup in the job sequence.
   b. Select **Run**.
   c. In the **Run Synchronization** dialog box, select any of the following options:
      - Run only the selected synchronization or
      - Run the selected synchronization, and the entire linked job sequence
10) Select **Confirm.**
11) On the **Monitoring** page, review the data transferred by the job sequence.

Searching Projects in Source Deployments

When adding or editing a synchronization, you can directly access and search a source deployment to locate projects in P6, Primavera Cloud, or Unifier to include in a data transfer.

To locate projects for a synchronization:

1) In the sidebar, select **Synchronizations.**
2) In the **Synchronizations** page, select + **Add...** or ✎ **Edit...**.
3) In the **Flow and Deployments** step of the Synchronization wizard, enter the following information:
   a. In the **Synchronization Name** field, enter a name for the synchronization.
   b. In the **Business Flow** list, select the business flow to be used by the synchronization.
   c. In the **Source** list, select a source application to send the data.
   d. In the **Destination** list, select a destination application to receive the data.

> **Note:** Select **Next** on each screen to advance to the next step.

4) In the **Parameters** step:
   a. From the **Field** list select the filter criteria for selecting values for each parameter.
   b. In the **Value** field, enter multiple values for a parameter as comma-separated values, and then select **Add Row**.

      Select **Add Row** to enter multiple filter criteria for selecting values for each parameter.
   c. Select **Edit row** to change a current filter criteria or value of a parameter.

      If the **Project Filter** parameter displays:
      1. In the **Fields** list, select *Lookup in <Product>*.

2. Select the ••• **Picker** button adjacent to the **Value** field.
3. Enter a project ID or a project name in the Search bar.
4. In the **Available Projects** field, select a project ID from the search results.
5. Select **Move Right** or double-click to include the project in the **Selected Projects** field.
6. Select **OK**.

> **Note**: When you select **Edit Row** to change the project filter using *Lookup in <Product>*, select **Delete Row** and then select the project again using *Lookup in <Product>*.

5) In the **Summary** step, review a summary of all the selections made in the previous steps.

Select any of the following actions:

- Select **Back** to navigate to a specific step and make changes.
- Select **Save** to add the synchronization.

The synchronization is now available for running on the **Synchronizations** page.

Monitoring Synchronizations

Use the monitoring feature in Gateway track the status of the transfer in each step of a synchronization jobs or troubleshoot failed jobs.

Data can be monitored in two ways:

- Monitor the transfer at each step of the synchronization run or
- Monitor the transfer for each object included in the synchronization run

This chapter describes how to monitor synchronizations in Primavera Gateway.

In This Section

Monitoring the Steps of a Data Transfer

To monitor the details in each step of a data transfer:

1) In the sidebar, select **Monitoring**.
2) (Optional) To find a specific synchronization job, use the **Filter** list to display specific jobs or select a column heading to sort information in the column alphabetically.
3) Perform any of the following actions:

   Select ↻ **Refresh** to update the results.

   From the **Actions** ▼ menu:

   - Select **Cancel** to cancel jobs with a status of **In Progress**, **Delegated**, **Pending**, or **Queued**.

     When a parent job is canceled:

     - The steps of the current job in process will complete, but the status of all subsequent steps will be set to *Never Run*.
     - All child jobs will also be canceled.
     - The status of all child jobs completed prior to the cancellation remain unchanged.
     - The status of all child jobs currently in progress is set to *Canceled*.
     - The status of all child jobs that did not start is set to *Canceled*.
   - Select **Delete** to delete the selected job.
   - Select **Re-run Job** to repeat the job run using the same parameters that were entered in the Synchronization page. If any fields have been added or removed from the job, then those changes will be included during the job re-run.

- Select **Delete XRef for Job** if you want to delete the current cross-references (tracking information) related to the job. Use this option if you want to recreate cross-references by sending the data again. The data will be considered new when sending to the destination. Only jobs with a status of *Completed*, *Failed*, *Completed with Warning*, or *Canceled* can be deleted. This option is available to Gateway administrators only.
- Select **Delete XRef by Deployment** if you want to only delete all cross-references (tracking information) associated with the data that has been sent in Gateway between specific deployments of the source and destination applications. You will need to create new jobs to create new cross-references to transfer data again between the deployments. This option is available to Gateway administrators only.

> **Note**: You are only deleting the deployment tracking information of the data transferred so far in Gateway. The sent data will continue to be available in the destination application.

4) In the **Job** column, select a job number.
5) In the **Job Details** tab, perform any of the following actions:
   - Expand each flow step to review the work done by the synchronization.
     - If a parent job has child jobs, select each job to review the flow steps for more information.
     - In the **Status** column, select **Review** link to access further information about the flow step on the **Summary** page.
     - Select **Download** to save the job details contained in each flow step as a zip file.

       If the job has a status of *Failed*, *or Completed with Warnings*, expand the failed step and view the log file containing the warning message or error message. The log files are generated in the format *Warning_job#.log* and *Error_job#.log*.

> **Note:** If you are a user or administrator with *no* data access privileges, you cannot review the actual data being transferred in each step of a job nor download the job details. An error message, *Insufficient Permissions*, is displayed.

   - Select **Details** to troubleshoot and locate errors when a job fails.

     View all the setup details used when a synchronization was run. This includes details on the synchronization, business flows, field-mapping templates, deployments, settings, and the run-time parameters used by the synchronization. Provide this file when you have to report an issue to Oracle Support.

Tips:

- You can configure the number of jobs displayed using the **Maximum number of job logs to display per page** setting in the **Settings** dialog box.
- If configured when defining a business flow, you can be notified by email when a synchronization job completes.

Monitoring the Objects in a Data Transfer

Use the monitoring feature in Primavera Gateway to track synchronization jobs or troubleshoot failed jobs that returned errors when transferring each object.

To monitor the work done on each object:

1) In the sidebar, select **Monitoring**.
2) (Optional) To find a specific synchronization job, use the **Filter** list to display specific jobs or select a column heading to sort information in the column alphabetically.
3) To update the results, select ↻ **Refresh**.
4) In the **Job** column, select a job number.
5) On the **Job #** page, select the **Data Details** tab.
6) (Optional) Select **File Output...** to download the file data to any file format supported in Gateway (csv, xls, xlsx, and XML).

> **Note**: The button displays only when when File is the destination application and the **File Data Source Type** is set to *File Upload* in the File Provider deployment.

7) In the **Summary** section, select an action count for a business object in any of the following columns:
   - **Create**: The estimated number of create actions that will be performed by the job in the transfer of each object in the destination application.
   - **Update**: The estimated number of update actions that will be performed by the job in the transfer of each object in the destination application.
   - **Delete**: The estimated number of delete actions that will be performed by the job in the transfer of each object in the destination application.
   - **Error**: The estimated number of errors that will be generated by the job in the transfer of each object in the destination application.
   - **Total**: The estimated total number of actions that will be performed by the job in the transfer of each object in the destination application.
8) In the **Business Object Details** section of the selected business object:
   - Review the actual data that was transferred in each **Create, Update,** and **Delete** actions performed on the business object.
   - Review the actual **Response** for each action in the destination application.
   - Review the **Errors** generated for each data that failed to be transferred by the synchronization.

Notes:

- If you have no access to data, you cannot view the details of the data passed in each object. You can only view the errors and warning messages associated with each step.
- When you download the log files, the synchronization setup details are also included in the download.
- The object level reporting details can be downloaded only after a synchronization job reaches the **Update Destination** step in a flow.

Appendix: Fields Supported in Project Data Mapping Templates

The following field mapping templates are delivered as out-of-the-box templates for transferring project data between a Microsoft Project file in XML format and Primavera Cloud application.

In This Section

Activity data for MSP and Primavera Cloud

Depending on the destination application, this project data field mapping template creates a **Task** object in the Microsoft Project provider or an **Activity** object in Primavera Cloud.

The following fields are mapped in each application:

MSP Fields	Gateway Fields	Primavera Cloud Fields
ActualDuration	ActualDuration	actualDuration
ActualFinish	ActualFinishDate	actualFinishDate
ActualStart	ActualStartDate	actualStartDate
ActualWork	ActualLaborUnits	actualLaborUnits
CalendarCode	CalendarCode	calendarCode
CalendarUID	CalendarObjectId	calendarId
ConstraintDate	PrimaryConstraintDate	constraintDate
ConstraintType	PrimaryConstraintType	constraintType
Deadline	ExpectedFinishDate	expectedFinishDate

MSP Fields	Gateway Fields	Primavera Cloud Fields
Duration	PlannedDuration	plannedDuration
DurationType	DurationType	durationType
EarlyFinish	EarlyFinishDate	earlyFinishDate
EarlyStart	EarlyStartDate	earlyStartDate
Finish	FinishDate	finishDate
Finish	PlannedFinishDate	plannedFinishDate
ID	Id	activityCode
LateFinish	LateFinishDate	lateFinishDate
LateStart	LateStartDate	lateStartDate
Name	Name	activityName
PercentComplete	DurationPercentComplete	durationPercentComplete
PercentCompleteType	PercentCompleteType	percentCompleteType
PercentWorkComplete	UnitsPercentComplete	unitsPercentComplete
PhysicalPercentComplete	PhysicalPercentComplete	physicalPercentComplete
Priority	LevelingPriority	activityPriority
ProjectId	ProjectId	projectCode
ProjectObjectId	ProjectObjectId	projectId
RemainingDuration	RemainingDuration	remainingDuration
RemainingWork	RemainingLaborUnits	remainingLaborUnits
Start	PlannedStartDate	plannedStartDate
Start	StartDate	startDate
Status	Status	activityStatus
SummaryTaskObjectId	WBSObjectId	wbsId
Type	Type	activityType
WBS	WBSCode	wbsCode
Work	AtCompletionLaborUnits	atCompletionLaborUnits

Calendar data from Primavera Cloud to MSP

This project data field mapping template creates **Calendar** object data from Primavera Cloud in Microsoft Project provider.

The following fields are mapped in each application:

Primavera Cloud Fields	Gateway Fields	MSP Fields
calendarExceptions	HolidayOrExceptions	HolidayOrExceptions
dayHourCount	HoursPerDay	HoursPerDay
monthHourCount	HoursPerMonth	HoursPerMonth
weekHourCount	HoursPerWeek	HoursPerWeek
yearHourCount	HoursPerYear	HoursPerYear
calendarCode	Name	Name
standardWorkWeek	StandardWorkWeek	StandardWorkWeek

Calendar data from MSP to Primavera Cloud

This project data field mapping template creates **Calendar** object data from Microsoft Project in Primavera Cloud.

The following fields are mapped in each application:

MSP Fields	Gateway Fields	Primavera Cloud Fields
HolidayOrExceptions	HolidayOrExceptions	calendarExceptions
HoursPerDay	HoursPerDay	dayHourCount
HoursPerMonth	HoursPerMonth	monthHourCount
HoursPerWeek	HoursPerWeek	weekHourCount
HoursPerYear	HoursPerYear	yearHourCount
Name	Code	calendarCode
Name	Name	calendarName
StandardWorkWeek	StandardWorkWeek	standardWorkWeek

Project data from Primavera Cloud to MSP

This project data field mapping template creates a **Project** object data in the Microsoft Project provider from Primavera Cloud.

The following fields are mapped in each application:

MSP Fields	Gateway Fields	Primavera Cloud Fields
CalendarUID	ActivityDefaultCalendarObjectId	calendarId
DefaultTaskType	ProjectDefaultDurationType	projectDefaultDurationType
FinishDate	FinishDate	finishDate
Name	Name	projectName
StartDate	StartDate	startDate
StatusDate	DataDate	dataDate

Project data from MSP to Primavera Cloud

This project data field mapping template creates **Project** object data in Primavera Cloud from Microsoft Project provider.

The following fields are mapped in each application:

MSP Fields	Gateway Fields	Primavera Cloud Fields
CalendarUID	ActivityDefaultCalendarObjectId	calendarId
DefaultTaskType	ProjectDefaultDurationType	projectDefaultDurationType
FinishDate	FinishDate	finishDate
Name	Id	projectCode
Name	Name	projectName
StartDate	StartDate	startDate
StatusDate	DataDate	dataDate

Relationship data for MSP and Primavera Cloud

Depending on the destination application, this project data field mapping template creates a **Relationship** object in the Microsoft Project provider or the Primavera Cloud provider.

The following fields are mapped in each application:

MSP Fields	Gateway Fields	Primavera Cloud Fields
Lag	Lag	lagHours

MSP Fields	Gateway Fields	Primavera Cloud Fields
PredecessorTaskId	PredecessorActivityId	predActivityCode
PredecessorTaskObjectId	PredecessorActivityObjectId	predActivityId
SuccessorTaskId	SuccessorActivityId	succActivityCode
SuccessorTaskObjectId	SuccessorActivityObjectId	succActivityId
Type	Type	relationshipType

Resource Assignment data from Primavera Cloud to MSP

This project data field mapping template creates an **Assignment** object in the Microsoft Project provider from a **ResourceAssignment** object in Primavera Cloud.

The following fields are mapped in each application:

MSP Fields	Gateway Fields	Primavera Cloud Fields
ActualFinish	ActualFinish	actualFinishDate
ActualStart	ActualStart	actualStartDate
ActualWork	ActualUnits	actualUnits
Delay	PlannedLag	plannedLag
Finish	FinishDate	finishDate
ProjectId	ProjectId	projectCode
RemainingUnitsPerHour	RemainingUnitsPerHour	remainingUnitsPerHour
RemainingWork	RemainingUnits	remainingUnits
ResourceId	ResourceId	resourceCode
ResourceObjectId	ResourceObjectId	resourceId
ResourceType	ResourceType	resourceType
Start	StartDate	startDate
TaskObjectId	ActivityObjectId	activityId
TaskType	ActivityType	activityType
Units	PlannedUnitsPerTime	plannedUnitsPerTime
Work	PlannedUnits	plannedUnits

MSP Fields	Gateway Fields	Primavera Cloud Fields
WorkContour	CurveName	curveName

Resource Assignment data from MSP to Primavera Cloud

This project data field mapping template maps fields from the **Assignment** object in Microsoft Project Provider to create a **ResourceAssignment** object in Primavera Cloud.

The following fields are mapped in each application:

MSP Fields	Gateway Fields	Primavera Cloud Fields
ActualFinish	ActualFinish	actualFinishDate
ActualStart	ActualStart	actualStartDate
ActualWork	ActualUnits	actualUnits
Delay	PlannedLag	plannedLag
Finish	FinishDate	finishDate
Finish	PlannedFinish	plannedFinishDate
ObjectId	AssignmentCode	assignmentCode
ProjectId	ProjectId	projectCode
RemainingUnitsPerHour	RemainingUnitsPerHour	remainingUnitsPerHour
RemainingWork	RemainingUnits	remainingUnits
ResourceId	ResourceId	resourceCode
ResourceObjectId	ResourceObjectId	resourceId
ResourceType	ResourceType	resourceType
Start	PlannedStart	plannedStartDate
Start	StartDate	startDate
TaskObjectId	ActivityObjectId	activityId
TaskType	ActivityType	activityType
Units	PlannedUnitsPerTime	plannedUnitsPerTime
Work	PlannedUnits	plannedUnits
WorkContour	CurveName	curveName

Resource data from Primavera Cloud to MSP

This project data field mapping template creates a **Resource** object from Primavera Cloud in the Microsoft Project provider.

The following fields are mapped in each application:

MSP Fields	Gateway Fields	Primavera Cloud Fields
CalendarCode	CalendarCode	calendarCode
CalendarUID	CalendarObjectId	calendarId
EmailAddress	EmailAddress	emailAddress
IsActive	IsActive	isActive
Name	Name	resourceName
ParentObjectId	ParentObjectId	parentId
Type	ResourceType	resourceType
UOMObjectId	UOMObjectId	unitOfMeasureId

Resource data from MSP to Primavera Cloud

This project data field mapping template creates a **Resource** object in Primavera Cloud from Microsoft Project provider.

The following fields are mapped in each application:

MSP Fields	Gateway Fields	Primavera CloudFields
CalendarUID	CalendarCode	calendarId
CalendarUID	CalendarObjectId	calendarCode
EmailAddress	EmailAddress	emailAddress
IsActive	IsActive	isActive
Name	Id	resourceCode
Name	Name	resourceName
ParentObjectId	ParentObjectId	parentId
Type	ResourceType	resourceType
UOMObjectId	UOMObjectId	unitOfMeasuretId

Resource Rate data for MSP and Primavera Cloud

Depending on the destination application, this project data field mapping template creates a **Rate** object in the Microsoft Project provider or a **ResourceRate** object in Primavera Cloud.

The following fields are mapped in each application:

MSP Fields	Gateway Fields	Primavera Cloud Fields
MaxUnits	MaxUnitsPerTime	maxUnitsPerTime
RatesFrom	EffectiveDate	effectiveDate
ResourceObjectId	ResourceObjectId	resourceId

Unit of Measure data for MSP and Primavera Cloud

Depending on the destination application, this project data field mapping template creates a **UnitOfMeasure** object in Microsoft Project provider or Primavera Cloud.

The following field is mapped in each application:

MSP Fields	Gateway Fields	Primavera Cloud Fields
MaterialLabel	Abbreviation	key

WBS data for MSP and Primavera Cloud

Depending on the destination application, this project data field mapping template creates a **SummaryTask** object in the Microsoft Project provider or a **WBS** object in Primavera Cloud.

The following fields are mapped in each application:

MSP Fields	Gateway Fields	Primavera Cloud Fields
Name	Name	wbsName
ParentObjectId	ParentObjectId	parentId
ProjectId	ProjectId	projectId
ProjectObjectId	ProjectObjectId	wbsCode

Glossary of Terms

The following is a list of Gateway terminology used in this guide.

B

Business Flow

A collection of business objects and their supported fields selected for data transfer.

C

Cross reference

A means for Gateway to track data being sent from the source application and received in the destination application. A cross-reference determines if the data is to be regarded as new data or an update to existing data in the destination application. If you delete or remove a cross-reference in Gateway, all history of data transfers is deleted within Gateway, although the data that was sent using this cross-reference will continue to exist in the destination application.

D

Deployment

The information required to connect to a specific database or an instance of an application from or to Gateway. For example, you may want to connect to two instances of a Primavera Cloud: *Testing* and *Production* from Gateway.

Destination Application

The application to which the data is being sent to.

F

Field Mapping Template

A field mapping template is a list of business objects and fields that are to be transferred from the source application to the destination application. It also contains information on how each source business object and destination business object is mapped with a corresponding Gateway business object. One or more field mapping templates are used in a business flow.

Flow Step

A business flow is executed as a distinct sequence of flow steps. A flow step executes a specific action within a flow. For example, the **Load** step loads data from the source application.

For more details, see the section, *About Flow Steps*.

M

Master Data

Master data are key data elements which influence all data transfers. For example, roles and resources are considered as master data for managing any project in an application.

P

Provider

An adapter that connects an application with Gateway. For example, the P6 provider connects P6 EPPM with Gateway.

Project Data

Project data refers to objects and fields associated with a specific project in an application. The scope of these data elements are limited to only a specific project in an application.

S

Source Application

The application from which the data is being sent from.

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