



PRIMAVERA

**Gateway Customization Guide
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Customization Overview

Primavera Gateway is an application that facilitates sharing project, resource, and other data between your enterprise application and Primavera applications, enabling you to combine Oracle Primavera's management and scheduling power for projects, portfolios, and resources with other enterprise software.

The *Gateway Customization Guide* describes how to customize an integration using a provider that has been created for Primavera Gateway. Also see the *Provider's Reference Guide* for a list of business objects supported by each Primavera provider in the data dictionary.

Primavera Gateway Architecture

Primavera Gateway is a web application that is deployed on a WebLogic application server. The following components are required to load data into a Primavera application and the Gateway database:

- ▶ **Seed Data**, XML files that provide flows and other data that illustrate best practices, which can be used as a starting point for your implementation.
- ▶ **Primavera Gateway Framework**, which includes:
 - ▶ Primavera Gateway user interface
 - ▶ The following providers to support integrations with Primavera applications:
 - **P6 provider**
The P6 provider enables you to share data with P6 EPPM. Primavera Gateway supports P6 EPPM integration with the Oracle Primavera Prime application and a Sample provider.
 - **Prime provider**
The Prime provider enables you to share data with the Oracle Primavera Prime application. Primavera Gateway supports Oracle Primavera Prime integration with the P6 EPPM application.
 - **EnterpriseTrack provider**
The EnterpriseTrack provider enables you to share data with Oracle Instantis EnterpriseTrack application. Primavera Gateway supports Oracle Instantis EnterpriseTrack integration with a Sample provider.
 - **Unifier provider**
The Unifier provider enables you to share data with the Primavera Unifier application. Primavera Gateway supports Primavera Unifier integration with the P6 EPPM application.
 - **Sample provider**
The Sample provider is a provider for demonstration purposes only. The purpose of the Sample provider is to illustrate how to use Primavera Gateway to synchronize data between a Primavera application and the Sample provider. Primavera Gateway supports a Sample provider integration with P6 EPPM and Oracle Instantis EnterpriseTrack applications.

What can be Customized?

With a provider, an integration can be customized for the following:

- ▶ Additional fields can be defined
- ▶ Additional direct field mapping templates can be provided
- ▶ Additional custom steps can be defined
- ▶ Additional flows and flow parameters can be defined and specified and the Java code can be extended to use new parameters
- ▶ Additional custom Java field mappings and java custom steps can be provided
- ▶ Additional Groovy field mappings can be provided

Additionally, you can include Java code that uses the custom Java field mappings, custom steps, and custom parameters. You can also use Groovy code for custom field mappings.

As with most application development work, when you customize a provider, you will generally need to involve people that have various skills and that perform various roles: programmers, analysts, users, administration, etc.

Where are the Customizations Stored?

Customizations that you make by interacting with Primavera Gateway are stored in an Oracle database. The following items are stored in the database:

- ▶ Cross references (Xref), data value mappings (DVM), flows, metadata (data dictionary), and customizations
- ▶ Audit information, logs, and intermediate artifacts
- ▶ Configuration settings
- ▶ Schedules

Final Customization Artifacts

The following files must be created and deployed with each provider customization:

- ▶ A customization description XML file
- ▶ A `.jar` file containing any Java code to implement the customization interfaces. The jar file is not needed if the customization does not have any java code.

Customizing an Integration

To customize an integration, complete the following steps:

- 1) Set up your environment.
- 2) If you have Java code, then implement the customization interfaces and build your project.
- 3) Create the customization description XML file.

Note: Usually, building the customization interfaces (Step 2) and creating the customization XML file (Step 3) occurs simultaneously.

- 4) Deploy your project and customize the Primavera Gateway database schema by any of the following methods:
 - ▶ Using the Gateway Setup Configuration Utility
 - ▶ Uploading the customization description XML file from the **Customization** tab in the Primavera Gateway user interface
- 5) Restart the WebLogic domain if the customization includes a .jar file.

For more details on each step, see the corresponding section in this guide.

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Setting Up Your Environment

Set up your environment as follows:

- 1) Create a folder to contain your customization files. This folder is known as the `<project_home>` folder.
- 2) Locate the `<Primavera_Gateway_home>\pdi\snapshots` folder and copy the **pdi.jar** file to an appropriate folder in your `<project_home>` folder.
- 3) Put the **pdi.jar** file in your project's classpath.

Implementing the Customization Interfaces and Building Your Project

The Entrance to the Java Code

The CustomizationHandler interface (`com.oracle.pgbu.pdi.customization.CustomizationHandler`) provides the entry point into all of the Java code in the customization jar file and therefore must be implemented.

In the sample customization project, the Customization class (under `com.mycompany.primavera.integration.custom` package) implements the CustomizationHandler interface. The Gateway loads this class through reflection, and retrieves all other feature implementations by querying this class.

The Java class also must be defined in the XML description file. You can find the following at the top of the customization.xml from the sample customization project.

```
<JavaClassPath>com.mycompany.primavera.Customization</JavaClassPath>
```

Defining Additional Fields

You can customize your application by defining additional fields.

The following example, defines two fields: CostCode UDF field, and TotalPlannedCost UDF field.

In P6 EPPM, customers might have fields defined for project, activity, or other objects. They can define them using codes (project code, resource code or activity code) or user defined fields (UDF). Similarly, they might have fields defined in their enterprise application as well that carries the same information as the corresponding fields in P6 EPPM. Hence, they would want these fields to be integrated when they implement their integration.

To provide support for these fields, you start by defining them in an XML description file and then reference the fields later in direct field mappings, foreign field mappings, custom Java field mappings, Groovy mappings, or custom steps. Here is a sample from the customization.xml in the sample customization project that defines the CostCode UDF field for Activity and the TotalPlannedCost UDF field for the project on the P6 side. You can define additional fields for the enterprise application side as well.


```
<CustomMetadata>
  <App>
    <Name>P6</Name>
    <BusinessObject>
      <Name>Activity</Name>
      <Field category="UDF">
        <Description>Cost code UDF Field</Description>
        <Name>CostCode</Name>
        <Type>String</Type>
        <MaxLength>255</MaxLength>
      </Field>
    </BusinessObject>
    <BusinessObject>
      <Name>Project</Name>
      <Field category="UDF">
        <Description>Total planned cost UDF Field</Description>
        <Name>TotalPlannedCost</Name>
        <Type>Double</Type>
      </Field>
    </BusinessObject>
  </App>
</CustomMetadata>
```

Direct Field Mapping

A direct field mapping template defines a series of simple one-to-one field mapping for one object. The integration product that is built on Primavera Gateway should come with a list of direct field mapping templates already, but you can add more if this becomes necessary. Here is an example from the customization.xml in the sample customization project that maps the CostCode field of the Activity business object and the TotalPlannedCost field of the Project business object:

```
<FieldMapTemplates>
  <App1Name>Sample</App1Name>
  <App2Name>P6</App2Name>
  <FieldMapTemplate>
    <Description>Cost code mapping for activity object</Description>
    <App1BusinessObjectName>Operation</App1BusinessObjectName>
    <Name>Activity Cost Code Mapping</Name>
    <PDIBusinessObjectName>Activity</PDIBusinessObjectName>
    <FieldMap>
      <App1>SampleCostCode</App1>
      <App2>CostCode</App2>
      <PDI>CostCode</PDI>
    </FieldMap>
  </FieldMapTemplate>
  <FieldMapTemplate>
    <Description>Total planned cost for project object</Description>
    <Name>Project Customization Mapping</Name>
    <PDIBusinessObjectName>Project</PDIBusinessObjectName>
    <FieldMap>
      <App1>TotalPlannedCost</App1>
      <App2>TotalPlannedCost</App2>
      <PDI>TotalPlannedCost</PDI>
    </FieldMap>
  </FieldMapTemplate>
</FieldMapTemplates>
```

Foreign Key Mapping

Foreign keys can now be defined and added in the data dictionary of the source and destination providers, including Gateway. Once defined, the mapping can then be defined in a mapping template.

```
<FieldMapTemplates>
  <App1Name>Sample</App1Name>
  <App2Name>P6</App2Name>
  <FieldMapTemplate>
    <Description>Demonstrating mapping foreign key in a mapping template</Description>
    <App1BusinessObjectName>Operation</App1BusinessObjectName>
    <Name>Sample Mapping Template</Name>
    <PDIBusinessObjectName>Activity</PDIBusinessObjectName>
    <FieldMap>
      <App1>SampleWorkOrderElementId</App1>
      <App2>SampleWBSObjectld</App2>
      <PDI>SampleWBSObjectld</PDI>
    </FieldMap>
  </FieldMapTemplate>
</FieldMapTemplates>
```

In the metadata XML file or the customization XML file, mark the field as a foreign key and set the JoinTo to the name of the object that this field is joining to as in the example below:

```

<Field>
  <Description>Sample WBS Object IDs</Description>
  <Name>SampleWBSObjectId</Name>
  <JoinTo>WBS</JoinTo>
  <Type>ForeignKey</Type>
</Field>

```

Custom Java Field Mapping

When the field mapping is not as simple as one-to-one, you can use a custom Java field mapping mechanism. Using a custom Java field mapping involves creating a class that implements the CustomFieldMap interface. When you implement the CustomFieldMap interface, you have control of the source object and the target object which permits you to write logic that involves more than one field. The SampleResourceCustomFieldMap class (under com.mycompany.primavera.integration.custom.java package) is a simple custom Java field mapping example in the sample customization project that concatenates the ResourceId and EmployeeName fields of Resource in the Host side and puts the concatenated field into the Name field of Resource in the PDI side. This class is defined in the customization.xml in the following section:

```

<JavaCustomizationMapping>
  <App1Name>Sample</App1Name>
  <App2Name>P6</App2Name>
  <FieldMapping>
    <Description>Resource Java Field Mapping</Description>
    <App1BusinessObjectName>Resource</App1BusinessObjectName>
    <App2BusinessObjectName>Resource</App2BusinessObjectName>
    <Name>SampleResourceCustomFieldMap</Name>
    <PDIBusinessObjectName>Resource</PDIBusinessObjectName>
    <Fields>
      <App1>
        <Name>EmployeeName</Name>
      </App1>
      <App2><Name>Name</Name>
    </App2>
    </Fields>
  </FieldMapping>
</JavaCustomizationMapping>

```

Custom Groovy Field Mapping

Custom Groovy Field Mapping is similar to Custom Java Field Mapping in that they both can handle more complex logics and allow multiple fields to participate at the same time. Custom Groovy Field Mapping is easier to use because the Groovy script is embedded in the customization description XML file, and therefore will not require a separate jar file.

The syntax of Custom Groovy Field Mapping in the customization description XML file is also similar to Custom Java Field Mapping. The following is an example from Customization.xml in SampleCustomization project.

```
<GroovyFieldMappingTemplates>
  <App1Name>Sample</App1Name>
  <App2Name>P6</App2Name>
  <GroovyFieldMappingTemplate>
    <Description>Sample Groovy resource field mapping</Description>
    <App1BusinessObjectName>Resource</App1BusinessObjectName>
    <App2BusinessObjectName>Resource</App2BusinessObjectName>
    <Name>SampleGroovyResourceFieldMap</Name>
    <PDIBusinessObjectName>Resource</PDIBusinessObjectName>
    <GroovyFieldMapping>
      <Direction>GuestToPDI</Direction>
      <SourceFields>EmployeeName, SampleDate</SourceFields>
      <TargetFields>Name, PDISampleDate</TargetFields>
      <RequireAllFields>true</RequireAllFields>
      <Script>
        <![CDATA[
          Name = EmployeeName.toUpperCase();
          if (containsField("EmployeeName")) {
            {Name} = [EmployeeName].toUpperCase();
          }
          if (containsField("SampleDate")) {
            def cal = new GregorianCalendar();
            cal.setTime([SampleDate]);
            cal.add(Calendar.DATE, -1);
            cal.add(Calendar.HOUR, 2);
            {PDISampleDate} = cal.getTime();
          }
        ]]>
      </Script>
    </GroovyFieldMapping>
  </GroovyFieldMappingTemplate>
</GroovyFieldMappingTemplates>
```

- 1) At the top, declare the two applications involved in the integration.
- 2) Declare what business object from each side is involved. In this example, it is Resource object for all 3 sides.
- 3) Within one Groovy mapping (GroovyFieldMapping tag), specify the following tags:
 - ▶ Direction: The direction of the mapping, it could be App1ToPDI, App2ToPDI, PDIToApp1 or PDIToApp2.
 - ▶ SourceFields: Comma-separated field names from the source object.
 - ▶ TargetFields: Comma-separated field names from the target object.
 - ▶ Script: The script in Groovy code.
 - ▶ RequireAllFields: When set to True, this mapping will be skipped unless all the source fields are present in the source object.

Within the Groovy script, use brackets to surround a source field, and curly brackets for a target field as in the following example:

```
{Name} = [EmployeeName].toUpperCase();
```

Where `EmployeeName` is a field from the source object, and `Name` is a field from the target object.

You can also use the `containsField` method to test whether a field exists in the source object. In the above example, the script uses `containsField` to test whether `EmployeeName` or `SampleDate` fields are there, before it executes the logic. This is important to know so as to avoid null pointer exceptions.

When the `RequireAllFields` tag is set to true, the script will only be called when all source fields are present in the source object; no possibility for null pointer exception there. But when the `RequireAllFields` tag is set to false, the script will be executed even when some source fields are not present in the source object. In the case when a source field is not present in the source object, for a primitive type field, such as integer, long, double types, the value will be set to default value 0; for a string type field, it will be set to default value ""; for a date type field, it will be set to null.

Limitations

For security reasons, the following limitations have been enforced on Groovy capability:

- ▶ Loops are not allowed.
- ▶ Closure is not allowed
- ▶ Class loading or reflection is not allowed
- ▶ New classes cannot be defined
- ▶ File system access is not allowed
- ▶ Network access is not allowed
- ▶ Classes under `java.lang` and `java.util` only can be accessed, but not any other packages.
- ▶ Writing one or more expressions and calculating one or more target fields from one or more source fields is allowed.

Adding Flow Parameters

A flow parameter is a mechanism to get user input for the flow. There are some parameters defined already for each flow. The flow parameter allows you to define additional parameters for the Java code to consume. Consider the sample parameter, `BusinessUnit`, in the sample customization project. `BusinessUnit` parameter is a custom type parameter which is a much more powerful parameter that requires an implementation class. The `BusinessUnitParameterExecutorImpl` class (under `com.mycompany.primavera.integration.custom.param` package) implements the `BusinessUnit` parameter.

The **`BusinessUnit`** parameter is defined in the **`Customization.xml`** file as follows:

```
<FlowDefinitionCustomization>
  <FlowDefinitionName>Export Project Data</FlowDefinitionName>
...
  <Parameter>
    <DefaultValue/>
    <Description>A sample custom type parameter</Description>
    <Name>BusinessUnit</Name>
    <Sequence>5</Sequence>
    <Title>Business Unit</Title>
    <Type>Custom</Type>
  </Parameter>
</FlowDefinitionCustomization>
```

Adding Custom Steps

A custom step is a very powerful tool that enables customers to make big changes to the flow. In addition to the normal Load/Convert/Save/Compare steps, you can insert a custom step anywhere after the load step and before the save step. This allows you to change the document before the document is passed on to the next step.

Note: When you use a custom step, you have to be very careful not to disrupt other existing flow steps.

In the sample customization project, there is a sample custom step, SummarizePlannedCost, that does a very simple summarization. It adds up the PlannedCost of all of the ResourceAssignments in the project and puts it into a new UDF field of the project object. The new UDF field is the SummarizePlannedCost field. After performing this task, the custom step removes all ResourceAssignment elements from the document. A simple boolean type parameter controls whether the custom step is executed or not.

SummarizePlannedCost can be found under the com.mycompany.primavera.integration.custom.step package and it is defined in the following section in the customization.xml file:

```
<FlowDefinitionCustomization>
  <FlowDefinitionName>Export Project Data</FlowDefinitionName>
  <!-- <DisableCompare>true</DisableCompare> Uncomment this line to disable compare
for this flow type -->
  <FlowStep>
    <Description>A sample custom step</Description>
    <Name>Summarize Planned Cost</Name>
    <OwnerAppName>P6</OwnerAppName>
    <Sequence>15</Sequence>
    <!-- to make sure it is inserted after Load step before the first convert step -->
    <Type>Custom</Type>
  </FlowStep>
...
</FlowDefinitionCustomization>
```

Notice that the sequence number that you set here determines when this step will get called. In this case, this step is inserted right after the P6 Load step.

Creating the Customization.XML File

Create a Customization.xml file for each provider application that you intend to customize.

Primavera Gateway ships a sample customization XML file. The sample customization XML file is located in **<Primavera Gateway Home>\sample\samplecustomization\data** folder. You can use this file along with the **Customization.xsd** schema file as an example to create a Customization.xml file specific to your deployment.

Deploying a Customization

Deploy a customization using the Gateway Setup Configuration utility to deploy a customization description XML file and a .jar file. The utility is a desktop application, and needs direct access to the database. After deploying the customization, you will need to restart the WebLogic domain.

Notes:

- When you install the Primavera Gateway, you have the option to install a sample customization project that contains examples that demonstrate how each additional feature can be defined. You will find the XML description file called Customization.xml under the **data** folder. Java source code and Groovy code is included as well.
- You can configure how the Primavera Gateway synchronizes data by interacting with the Primavera Gateway user interface. Additionally, you can create a provider, or customize an existing provider, to further control how the adapter loads the data. We supply a Sample provider that you can use to get started.

Uploading Customization Files Using the Configuration Utility

Use this procedure if a customization includes include XML files, jar files, and other files such as Java customization. If you have installed Gateway on a managed server, see **Supporting Java Customization on a Managed Server** (on page 16) for more details.

Note: If a customization does not include any jar files, and uses Groovy customization, then upload the XML file from the Gateway user interface.

To add or remove customization files in Gateway:

- 1) Stop the Gateway domain before adding or removing providers or customizations.
- 2) Ensure the following:
 - ▶ The **bin** folder of the supported Java JDK is included in the PATH.
 - ▶ If there are other JDK bin folders in the PATH, it should be listed first.
- 3) Navigate to the **<Primavera_Gateway_Home>/pdi/snapshots/dbsetup-dist** folder.
- 4) If you are installing on a non-Microsoft Windows system, type the following command for execute privileges:

chmod 755 Gateway-Configuration.sh

- 5) Run the following command:

- ▶ For Windows installations, run **Gateway-Configuration.bat**
 - ▶ For Linux and Solaris installations, run **./Gateway-Configuration.sh**
- 6) In the **Primavera Gateway Configuration Utility** dialog box, enter the following information:
- a. Select **Manage Customizations**, and select **Next**.
Selecting this option updates the `pdi.ear` file and the Gateway database with custom metadata from the customization XML files.
 - b. In the **Select Gateway ear file (pdi.ear) location**, enter or select **Browse** to locate the `.ear` file.
 - c. In the **Installed Gateway Customizations** field, review the list of customization files displayed in the dialog box, and perform any of the following actions:
 - To add a customization, select **Add Customization**, and navigate to the folder location of the customization file.
 - To remove a customization from the list, select a specific customization, and select **Remove**.
 - To delete a customization from the database and the `pdi.ear` file, select the **Delete** option and select **Remove**.
- 7) Enter the following database connection details:
- ▶ **DBA User Name**: Enter the name of the database administrator.
 - ▶ **DBA Password**: Enter the password for the database administrator.
 - ▶ **Database Host**: Enter the host name of the Oracle database on which you will be updating the Primavera Gateway database.
 - ▶ **Database Host Port**: Enter the port number of the Oracle database.
 - ▶ **Database Name**: Enter the Gateway database name and select any of the following methods to connect to the database.
 - **SID**: Enter the SID of the Oracle database.
 - **Service**: Enter the service name of the Oracle database.
 - ▶ **Schema Owner**: Enter the name of Gateway schema owner. (This name should match the name that was entered when you installed Primavera Gateway.)
 - ▶ **Schema Password**: Enter the password for the schema owner.
 - ▶ Select **Test Connection**. Modify the applicable fields if the connection fails and repeat as necessary.
 - ▶ Select **Update**. The status field displays a success message.

Select **Finish** to exit the configuration utility.

Supporting Java Customization on a Managed Server

If you have installed Gateway on a **managed server**, complete the following steps to ensure Java customization is supported:

- 1) Log in to the WebLogic Administration console for Gateway.
- 2) Select **pdi.ear** in **Deployments** tab and stop the deployment.
- 3) Select **Lock & Edit** in the left pane and select **pdi.ear** in **Deployments** tab.
- 4) Select **Update** to update `pdi.ear` for the managed server.

- 5) Save the changes from the left pane (Activate Changes)
- 6) Restart **pdi.ear** deployment.

Restarting the WebLogic Domain

Finally, complete the customizations by restarting the WebLogic domain. Depending on your operating system, proceed as follows to restart the Primavera Gateway domain.

Note: Oracle recommends that you use the `<PrimaveraGateway_home>\WLST\startGatewayWLDomain.*` scripts to stop and start the Primavera Gateway domain because these scripts contain the specific memory and timezone settings required by Primavera Gateway.

- 1) First stop the WebLogic domain.

For Windows, from the **Start** menu, point to **Oracle - Primavera Gateway** and select **Stop Primavera Gateway**.

This invokes the `stopGatewayWLDomain.cmd` file.

For Linux and Solaris, enter `cd <Primavera Gateway_Home>/WLST`, and then run the following script:

`./stopGatewayWLDomain.sh`

Note: If you are using a non Windows system, you may need to set permissions on the **`stopGatewayWLDomain.sh`** file. If so enter the following command: **`chmod 755 stopGatewayWLDomain.sh`**.

- 2) Start the WebLogic domain.

For Windows: From the **Start** menu, point to **Oracle - Primavera Gateway** and select **Start Primavera Gateway**.

This invokes the `startGatewayWLDomain.cmd` file.

For Linux and Solaris, enter `cd <Primavera Gateway_Home>/WLST`, and then run the following script:

`./startGatewayWLDomain.sh`

Appendix - Contents of Customization.XML

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Customization XML File

This file is loaded into the system by the data loader utility and is used to extend the system by adding any of the following customizations to the Source application, Gateway or the destination application:

- ▶ User-defined fields (UDFs)
- ▶ Mapping templates
- ▶ Java custom mappings
- ▶ Java custom steps
- ▶ Custom parameters
- ▶ Groovy field mappings
- ▶ Foreign field mappings
- ▶ Flow Definition customizations
- ▶ Custom metadata
- ▶ Custom XRefs

Schema File

Customization.xsd

Contents

A **Customization** element containing the following elements:

Element	Type	Parents	Description
Name	string restricted to maxLength(60)	Customization	The optional element that specifies the name of the customization.
Version	string restricted to maxLength(60)	Customization	The optional element that specifies the version of the customization.

Element	Type	Parents	Description
JavaClassPath	string restricted to maxLength(255)	Customization	The optional element that specifies the path to the customization file that loads the customization functions. This element is required if you are using Java customization.
CustomMetadata	CustomMetadataType	Customization	The optional element that contains zero to three App elements. An example use is to add references to user defined fields (UDFs).
CustomXRef	CustomXRefType	Customization	The optional element that contains zero to more custom XRef elements.
FieldMapTemplates	FieldMapTemplatesType	Customization	The optional element that contains zero to many FieldMapTemplate elements that can be used to map additional fields.
JavaCustomizationMapping	JavaCustomizationMappingType	Customization	The zero to many optional elements that contain the following elements: <ul style="list-style-type: none"> ▶ GuestAppName (required if the parent is present). ▶ HostAppName (required if the parent is present). ▶ Zero to many FieldMapping elements.
GroovyFieldMappingTemplates	GroovyFieldMappingTemplatesType	Customization	The optional element that contains zero to many GroovyFieldMappingTemplate elements.

Element	Type	Parents	Description
FlowDefinitionCustomization	FlowDefinitionCustomizationType	Customization	<p>The zero to many optional elements that allow you to add custom parameters to a particular flow. Contains the following elements:</p> <ul style="list-style-type: none"> ▶ FlowDefinitionName element (required if the parent is present). ▶ DisableCompare boolean flag. ▶ Zero to many FlowStep elements. ▶ Zero to many Parameter elements.

CustomMetadataType Table

Element	Type	Parent	Description
App	AppType For more details, see the AppType table below.	CustomMetadata	The application to which you are adding a user defined field (UDF).

CustomXRefType Table

Element	Type	Parent	Description
XRefMap	XRefMapType For more details, see the XRefMapType table below.	CustomXRef	The element that contains one or more XRef maps. A XRef map contains a mapping of business objects cross-referenced between two applications.

XRefMapType Table

Element	Type	Parent	Description
App1Name	string	XRefMap	The name of the application.
App2Name	string	XRefMap	The name of the application.
XRefObject	XRefObjectType For more details, see the XRefObjectType table below.	XRefMap	One or more XRef objects in the XRef map.

XRefObjectType Table

Element	Type	Parent	Description
Name	string	XRefObject	The name of the cross-reference object.
App1Name	string	XRefObject	The App1 business object name if different from the Name element.
PDIName	string	XRefObject	The PDI business object name if different from the Name element.
App2Name	string	XRefObject	The App2 business object name if different from the Name element.
App1PrimaryKeyField Name	string	XRefObject	The name of the primary key field in the database of the application.
PDIPrimaryKeyField Name	string	XRefObject	The name of the primary key field in the Gateway database.
App2PrimaryKeyField Name	string	XRefObject	The name of the primary key field in the database of the application.

AppType Table

Element	Type	Parent	Description
Name	string restricted to maxLength(60)	App	The name of the application to which you are adding a user-defined field (UDF).
ObjectCategory	ObjectCategoryType	App	Provides a mechanism for classifying objects.
FieldCategory	FieldCategoryType	App	Provides a mechanism for classifying fields. It is defined here and referenced by attribute "category" when a field is defined within a business object. For example, in the P6 provider, "udf" is defined as a field category to indicate that this field is an actual user-defined field in the P6 EPPM side.
BusinessObject	BusinessObjectType	App	The zero to many business object elements that are containers for field elements that relate to the business object specified by the Name element. All custom UDF fields defined in this element will be included when updating the business object.

ObjectCategoryType Table

Element	Type	Parent	Description
Name	string restricted to maxLength(60)	ObjectCategory	The name of the object category.

Element	Type	Parent	Description
Description	string restricted to maxLength(255)	ObjectCategory	The description of the object category.

FieldCategoryType Table

Element	Type	Parent	Description
Name	string restricted to maxLength(60)	FieldCategory	The name of the field category.
Description	string restricted to maxLength(255)	FieldCategory	The description of the field category.

BusinessObjectType Table

Element	Type	Parent	Description
Name	string restricted to maxLength(60)	BusinessObject	The name of the business object to which you are adding the user defined field.
Field	FieldType	BusinessObject	All custom UDF fields defined inside this element will be included when updating the business object.

FieldType Table

Element	Type	Parent	Description
Description	string restricted to maxLength(255)	Field	The element that describes the field. This description is presented in the Fields table on the Data Dictionary tab in the Primavera Gateway user interface.

Element	Type	Parent	Description
Name	string restricted to maxLength(60)	Field	The element that determines the name of the field. This name is presented in the Fields table of the Data Dictionary tab in the Primavera Gateway user interface.
JoinTo	string restricted to maxLength(60)	Field	The element that contains the name of the object to which it is being joined to.
Type	string restricted to maxLength(10) 'Boolean' 'DateTime' 'Double' 'Int' 'String' 'ForeignKey' 'Enum'	Field	The element that defines the data type of the value of the field's data when it is synchronized.
MaxLength	positiveInteger	Field	The optional element that defines the maximum length of the value of the field's data when it is synchronized. This element can be used with the Type element whose content is String to limit the field's data values.
MaxValue	double	Field	The optional element that defines the maximum value of the field's data when it is synchronized. This element can be used with the Type element whose content is Int to limit the field's data values.

Element	Type	Parent	Description
MinValue	double	Field	The optional element that defines the minimum value of the field's data when it is synchronized. This element can be used with the Type element whose content is Int to limit the field's data values.
FieldValue	FieldValueType	Field	An optional element that defines the value of an enum field type. Field elements can contain zero or more FieldValue elements if the Field element contains a Type element whose content is Enum.

FieldValueType Table

Element	Type	Parent	Description
Description	string restricted to maxLength(255)	FieldValue	An optional element that describes the fieldValue.
Value	string restricted to maxLength(60)	FieldValue	An optional element that defines an enumerated value.

FieldMapTemplatesType Table

Element	Type	Parents	Description
App1Name	string restricted to maxLength(60)	Customization	The name of the application.
App2Name	string restricted to maxLength(60)	Customization	The name of the application.

Element	Type	Parents	Description
GuestAppName	string restricted to maxLength(60)	Customization	The name of the guest application.
HostAppName	string restricted to maxLength(60)	Customization	The name of the host application.
FieldMapTemplate	FieldMapTemplateType	Customization	The container element that contains zero to many FieldMapTemplates included in the customization.

FieldMapTemplateType Table

Element	Type	Parents	Description
Description	string restricted to maxLength(255)	FieldMapTemplate	The text that is used in the Primavera Gateway user interface to provide a description of the field mapping.
App1BusinessObjectName	string restricted to maxLength(60)	FieldMapTemplate	The Guest business object name if different from the PDIBusinessObjectName element.
App2BusinessObjectName	FieldMapTemplateType	FieldMapTemplate	The Host business object name if different from the PDIBusinessObjectName element.
GuestBusinessObjectName	string restricted to maxLength(60)	FieldMapTemplate	Guest business object name if different from PDIBusinessObjectName element.
HostBusinessObjectName	string restricted to maxLength(60)	FieldMapTemplate	Host business object name if different from PDIBusinessObjectName element.

Element	Type	Parents	Description
Name	string restricted to maxLength(60)	FieldMapTempl ate	The text that is used in the Primavera Gateway user interface to provide a name for the field mapping.
PDIBusinessObject Name	string restricted to maxLength(60)	FieldMapTempl ate	The PDI business object name. Also indicates the guest and/or the host business object name if the GuestBusinessObjectNa me or the HostBusinessObjectNam e elements are omitted.
FieldMap	FieldMapType	FieldMapTempl ate	The element that specifies the field map.

FieldMapType Table

Element	Type	Parents	Description
App1	string restricted to maxLength(60)	FieldMap	The name of the application.
App2	string restricted to maxLength(60)	FieldMap	The name of the application.
Guest	string restricted to maxLength(60)	FieldMap	The element that specifies the name of the field that is involved in the mapping from the provider side of the mapping.
Host	string restricted to maxLength(60)	FieldMap	The element that specifies the name of the field that is involved in the mapping from the Primavera provider side of the mapping.

Element	Type	Parents	Description
PDI	string restricted to maxLength(60)	FieldMap	The element that specifies the name of the field that is involved in the mapping from the Gateway side.

JavaCustomizationMappingType Table

Element	Type	Parents	Description
App1Name	string restricted to maxLength(60)	JavaCustomiza tionMapping	The name of the application.
App2Name	string restricted to maxLength(60)	JavaCustomiza tionMapping	The name of the application.
GuestAppName	string restricted to maxLength(60)	JavaCustomiza tionMapping	The name of the application in the apptable in the Gateway database.
HostAppName	string restricted to maxLength(60)	JavaCustomiza tionMapping	The name of the Primavera application in the apptable in the Gateway database.
FieldMapping	FieldMappingType	JavaCustomiza tionMapping	The element that specifies the field mapping.

GroovyFieldMappingTemplatesType Table

Element	Type	Parents	Description
App1Name	string restricted to maxLength(60)	JavaCustomiza tionMapping	The name of the application.
App2Name	string restricted to maxLength(60)	JavaCustomiza tionMapping	The name of the application.

Element	Type	Parents	Description
GuestAppName	string restricted to maxLength(60)	GroovyFieldMappingTemplates	The name of the application designated as Guest application in the apptable in the Gateway database.
HostAppName	string restricted to maxLength(60)	GroovyFieldMappingTemplates	The name of the application designated as the Host application in the apptable in the Gateway database.
GroovyFieldMappingTemplate	GroovyFieldMappingTemplateType	GroovyFieldMappingTemplates	The name of the GroovyFieldMappingTemplate associated with the applications designated as Guest and Host.

GroovyFieldMappingTemplateType Table

Element	Type	Parents	Description
Description	string restricted to maxLength(255)	GroovyFieldMappingTemplates	The name of the application designated as Guest application in the apptable in the Gateway database.
App1BusinessObjectName	string restricted to maxLength(60)	GroovyFieldMappingTemplates	The name of the business object in the application.
App2BusinessObjectName	string restricted to maxLength(60)	GroovyFieldMappingTemplates	The name of the business object in the application.
GuestBusinessObjectName	string restricted to maxLength(60)	GroovyFieldMappingTemplates	The Guest business object name if it is different from the PDIBusinessObjectName element.
HostBusinessObjectName	string restricted to maxLength(60)	GroovyFieldMappingTemplates	The Host business object name if it is different from the PDIBusinessObjectName element.

Element	Type	Parents	Description
Name	string restricted to maxLength(255)	GroovyFieldMappingTemplates	The name of the Groovy business object.
PDIBusinessObjectName	string restricted to maxLength(60)	GroovyFieldMappingTemplates	The name of the PDIBusinessObjectName in the Gateway data dictionary.
GroovyFieldMapping	GroovyFieldMappingType	GroovyFieldMappingTemplates	The GroovyFieldMapping being associated with the GuestBusinessObjectName, HostBusinessObjectName, and PDIBusinessObjectName.

GroovyFieldMappingType Table

Element	Type	Parents	Description
Direction	string restricted to maxLength(10) 'GuestToPDI' 'HostToPDI' 'PDIToGuest' 'PDIToHost' 'App1ToPDI' 'App2ToPDI' 'PDIToApp1' 'PDIToApp2'	GroovyFieldMapping	The direction of the data flow between the source application and destination application in the GroovyFieldMapping.
SourceFields	string	GroovyFieldMapping	The fields in the source application referenced in the GroovyFieldMapping.
TargetFields	string	GroovyFieldMapping	The fields in the target application referenced in the GroovyFieldMapping.
RequireAllFields	boolean	GroovyFieldMapping	The flag to determine if all fields are required for the GroovyFieldMapping.

Element	Type	Parents	Description
Script	string restricted to maxLength(1024)	GroovyFieldMapping	The element that contains the Groovy code.

FieldMappingType Table

Element	Type	Parents	Description
Description	string restricted to maxLength(255)	FieldMapping	The description of the custom java field map.
App1BusinessObjectName	string restricted to maxLength(60)	FieldMapping	The name of the business object in the application.
App2BusinessObjectName	string restricted to maxLength(60)	FieldMapping	The name of the business object in the application.
GuestBusinessObjectName	string restricted to maxLength(60)	FieldMapping	The Guest business object name if different from PDIBusinessObjectName element.
HostBusinessObjectName	string restricted to maxLength(60)	FieldMapping	The Host business object name if different from PDIBusinessObjectName element.
Name	string restricted to maxLength(255)	FieldMapping	The name of the field map that is used to look up the Java class in the code that you have written that contains customization logic.
PDIBusinessObjectName	string restricted to maxLength(60)	FieldMapping	The Gateway business object name in the field mapping.
Fields	FieldsType	FieldMapping	The container element for the fields defined inside this element to be included when loading the business object.

FieldsType Table

Element	Type	Parents	Description
App1	FieldsFieldType	Fields	The name of the application.
App2	FieldsFieldType	Fields	The name of the application.
Guest	FieldsFieldType	Fields	The element that specifies the name of the fields in the mapping from the application designated as the Guest application.
Host	FieldsFieldType	Fields	The element that specifies the name of the fields in the mapping from the Primavera application designated as the Host application.
PDI	FieldsFieldType	Fields	The element that specifies the name of the fields that is involved in the mapping from the Gateway side.

FlowDefinitionCustomizationType Table

Element	Type	Parents	Description
FlowDefinitionName	string restricted to maxLength(60)	FlowDefinition Customization	The name of the flow to which the parameters are to apply.
Application Name	string restricted to maxLength(60)	FlowDefinition Customization	The name of the application to which the customization applies.
DisableCompare	boolean	FlowDefinition Customization	The flag when set to true, causes compare to be disabled for all FlowTypes.

Element	Type	Parents	Description
AppType	string restricted to maxLength(10) 'Guest' 'Host' 'PDI'	FlowDefinition Customization	The role of the application in the flow.
FlowStep	FlowStepType	FlowDefinition Customization	The element that contains flow steps that define an end-to-end synchronization.
Parameter	ParameterType	FlowDefinition Customization	The element that specifies the properties of the parameter.

FlowStepType Table

Element	Type	Parents	Description
Description	string restricted to maxLength(255)	FlowStep	The element that describes the purpose of the flow step.
Name	string restricted to maxLength(60)	FlowStep	The element that determines the name of the flow step.
OwnerAppType	string restricted to maxLength(10) 'Guest' 'Host' 'PDI'	FlowStep	The element that the system uses to determine which document format to use when parsing XML document data. For example, specifying the OwnerAppType as Host and P6 is the host of the flow causes the system to ask the P6 provider to provide the implementation of this step.

Element	Type	Parents	Description
Sequence	int	FlowStep	<p>A number that determines when the step will run relative to the other steps in the flow.</p> <p>When this element is used in a customization.xml file, you can use the following SQL commands to determine the existing sequencing, from which you can determine an appropriate sequence number for a particular flow type.</p> <p>Note: This example returns the sequence number for the Export Project Data flow type. Revise the commands as appropriate for the other flow types.</p> <pre>select fd.flowdef_name, fs.flowstep_name, fs.flowstep_type, fs.flowstep_seqno from flowstep fs, flowdef fd where fs.flowdef_id = fd.flowdef_id and fd.flowdef_name = 'Export Project Data' order by fd.flowdef_name, fs.flowstep_seqno;</pre>
Type	string restricted to maxLength(20) 'Custom'	FlowStep	<p>The element that specifies the flow step type. 'Custom' is the only valid value when this element is used in a customization.xml file.</p>

ParameterType Table

Element	Type	Parents	Description
DefaultValue	string restricted to maxLength(255)	Parameter	The default value for this custom parameter that is used when the parameter is included in the flow and the value is not changed.
Description	string restricted to maxLength(255)	Parameter	The element that provides a description of the parameter.
EnumerationOptions	EnumerationOptionsType For more details see the EnumerationOptionsType Table.	Parameter	The element that contains the list of enumerated values when the Parameter element is specified as an enum.
Name	string restricted to maxLength(60)	Parameter	The element that provides the name of the parameter. The name is used to lookup the parameter in the provider Java code.
Sequence	int	Parameter	The element that provides the mechanism for ordering the parameters.
Title	string restricted to maxLength(255)	Parameter	The element that provides the display title of the parameter.
Type	string restricted to maxLength(15) Boolean DateTime Double Int String Password Enum Custom	Parameter	The element that defines the data type of the value of the field's data when it is synchronized.

EnumerationOptionsType Table

Element	Type	Parents	Description
Enumeration	EnumerationType	EnumerationOptions	The element that specifies the name of the enumeration.

FieldsFieldType Table

Element	Type	Parents	Description
Name	string restricted to maxLength(60)	Fields	The element that specifies the name of the field.

EnumerationType Table

Element	Type	Parents	Description
Name	string restricted to maxLength(60)	Fields	The element that specifies the name of the enumeration type.

For More Information

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Where to Get Documentation

Complete documentation libraries for Primavera Gateway releases are available on the Oracle Technology Network (OTN) at:

<http://www.oracle.com/technetwork/documentation/default-1923957.html>

From this location you can either view libraries online or download them to have local copies. We recommend viewing them from OTN to ensure you always access the latest versions, including critical corrections and enhancements.

Primavera Gateway is configured to access its help system on OTN. However, you can also install a local version when you install the software.

The documentation assumes a standard setup of the product, with full access rights to all features and functions.

The following table describes the core documents available for Primavera Gateway and lists the recommended readers by role.

Title	Description
<i>Gateway Help</i>	Describes how to work with Primavera Gateway and provides information to help users accomplish tasks. All users should read the Help.
<i>Gateway Developer's Guide</i>	Provides information on how third-party systems such as enterprise resource management (ERP) and enterprise asset management (EAM) systems can create their own providers in order to integrate with Primavera products. Developers of third-party providers that integrate with Primavera products via Primavera Gateway should read this book.


Title	Description
<i>Gateway Customization Guide</i>	<p>Provides information on how to customize an existing third-party integration.</p> <p>Developers interested in customizing existing third-party providers that integrate with Primavera products via Primavera Gateway should read this book.</p>
<i>Gateway Provider Reference Guide</i>	<p>Provides a list of the business objects available for each supported provider.</p> <p>Developers of third-party providers that integrate with Primavera products via Primavera Gateway should read this book.</p>
<i>EBS Provider Reference Guide</i>	<p>Provides a list of the business objects available for the EBS provider.</p> <p>Developers of third-party providers that integrate with Primavera products via Primavera Gateway should read this book.</p>
<i>VCP Provider Reference Guide</i>	<p>Provides a list of the business objects available for the VCP provider.</p> <p>Developers of third-party providers that integrate with Primavera products via Primavera Gateway should read this book.</p>
<i>Manual Deployment Guide</i>	<p>Provides information on how to manually install and configure Primavera Gateway.</p> <p>The Primavera Gateway network administrator/database administrator and the administrator for the third-party or ERP system should read this guide.</p>
<i>Gateway Installation and Configuration Guide</i>	<p>Provides information on how to install and configure Primavera Gateway. Primavera Gateway is a product that facilitates integrations with Primavera products and third-party systems such as enterprise resource management (ERP) and enterprise asset management (EAM) systems.</p> <p>The Primavera Gateway network administrator/database administrator and the administrator for the third-party or ERP system should read this guide.</p>
<i>Gateway Upgrade Guide</i>	<p>Provides a sequence of procedures that must be completed to upgrade to a new version of Primavera Gateway.</p> <p>The Primavera Gateway network administrator/database administrator and the administrator for the third-party or ERP system should read this guide.</p>

Title	Description
<i>Gateway Performance and Sizing Guide</i>	<p>Provides hardware and software requirements for deploying Primavera Gateway.</p> <p>The Primavera Gateway network administrator/database administrator and the administrator for the third-party or ERP system should read this guide.</p>
<i>Gateway Security Guide</i>	<p>Provides guidelines on establishing a highly secure environment for all Primavera Gateway environments.</p> <p>The Primavera Gateway network administrator/database administrator and the administrator for the third-party or ERP system should read this guide.</p>
<i>Gateway API Programmer's Guide</i>	<p>Provides instructions on how to access and use Primavera Gateway REST APIs.</p> <p>The Primavera Gateway network administrator/database administrator and Primavera Gateway users having the Gateway Developer role should read this guide.</p>
<i>Connecting with Instantis EnterpriseTrack</i>	<p>Provides instructions on how to setup the integration environment for Oracle Instantis EnterpriseTrack in Primavera Gateway.</p> <p>The Primavera Gateway network administrator/database administrator and the administrator for the third-party system should read this guide.</p>
<i>Connecting Prime and P6 EPPM</i>	<p>Provides instructions on how to setup the integration environment between Oracle Primavera Prime and P6 Enterprise Project Portfolio Management in Primavera Gateway.</p> <p>The Primavera Gateway network administrator/database administrator and the administrator for the third-party system should read this guide.</p>
<i>Connecting Unifier and P6 EPPM</i>	<p>Provides instructions on how to setup the integration environment between Oracle Primavera Unifier and P6 Enterprise Project Portfolio Management in Primavera Gateway.</p> <p>The Primavera Gateway network administrator/database administrator and the administrator for the third-party system should read this guide.</p>
<i>Migrating P6 Data Between Distinct Environments</i>	<p>Provides instructions on how to setup the integration environment between distinct P6 deployments to transfer P6 data in Primavera Gateway.</p> <p>The Primavera Gateway network administrator/database administrator and the administrator should read this guide.</p>

Title	Description
<i>Connecting E-Business Suite</i>	Provides instructions on how to setup the integration environments for Oracle E-Business Suite with P6 Enterprise Project Portfolio Management and Instantis EnterpriseTrack in Primavera Gateway. The Primavera Gateway network administrator/database administrator and the administrator for the third-party system should read this guide.
<i>Connecting Value Chain Planning and P6 EPPM</i>	Provides instructions on how to setup the integration environment between Oracle Value Chain Planning and P6 Enterprise Project Portfolio Management in Primavera Gateway. The Primavera Gateway network administrator/database administrator and the administrator for the third-party system should read this guide.
<i>Configuring Gateway for Single Sign On</i>	Provides instructions on how to configure Oracle Access Manager (OAM) and then enable Single Sign On for Primavera Gateway. The Primavera Gateway network administrator/database administrator should read this guide.
<i>Gateway Licensing Information User Manual</i>	Lists licensing information of all third-party software that is used or associated with the Oracle software program.
<i>Tested Configurations</i>	Lists the configurations that have been tested and verified to work with Primavera Gateway. The Primavera Gateway network administrator/database administrator and the administrator for the third-party or ERP system should read this guide.

Distributing Information to the Team

You can copy the online documentation to a network drive for access by project participants. Each team member can then view or print those portions that specifically relate to his or her role in the organization.

Throughout this documentation, the Security Guidance icon  helps you to quickly identify security-related content to consider during the installation and configuration process.

Where to Get Training

To access comprehensive training for all Primavera products, go to:

<http://education.oracle.com>

Oracle Learning Library

The Oracle Learning Library (OLL) provides online learning content covering Primavera products. Content includes videos, tutorials, articles, demos, step-by-step instructions to accomplish specific tasks, and self-paced interactive learning modules.

To access the learning library's Primavera content, go to:

<http://www.oracle.com/goto/oll>

Where to Get Support

If you have a question about using Oracle products that you or your network administrator cannot resolve with information in the documentation or help, click <http://support.oracle.com/>. This page provides the latest information on contacting Oracle Global Customer Support, knowledge articles, and the support renewals process. For more information about working with Support, visit <https://support.oracle.com/epmos/faces/DocumentDisplay?id=888813.2> to view Support Tools & Tips.

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit <http://www.oracle.com/us/support/contact-068555.html> or visit <http://www.oracle.com/us/corporate/accessibility/support/index.html> if you are hearing impaired.

Using Primavera's Support Resource Centers

Primavera's Support Resource Center provides links to important support and product information. Primavera's Product Information Centers (PICs) organize documents found on My Oracle Support (MOS), providing quick access to product and version specific information such as important knowledge documents, Release Value Propositions, and Oracle University training. PICs also offer documentation on Lifetime Management, from planning to installs, upgrades, and maintenance.

Visit <https://support.oracle.com/epmos/faces/DocumentDisplay?id=1486951.1> to access links to all of the current PICs.

PICs also provide access to:

- ▶ **Communities** are moderated by Oracle providing a place for collaboration among industry peers to share best practices.
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For more information about working with Support, visit <https://support.oracle.com/epmos/faces/DocumentDisplay?id=888813.2>.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

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Oracle Primavera Gateway Customization Guide

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