



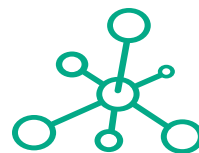
Project and Portfolio Management Center

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Web Services Guide

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Chapter 1: Getting Started with PPM Web Services

Overview of PPM Web Services

Organizations are facing an increasing need to integrate various systems and applications. Web service technology offers a standardized way of achieving such integration. This guide describes the Web services available for you to use in your HPE Project and Portfolio Management Center (PPM Center) deployment. Using PPM Web services provides significant benefits over the Open Interface and other types of direct PPM database integration, and helps you efficiently achieve your strategic integration initiatives.

PPM includes Web service support for the following application modules:

- **Project Management.** Enables organizations to streamline and standardize the management of project activities using a template-based, collaborative approach.
- **Program Management.** Provides a single location from which to initiate, operate, and manage your organization's portfolio of programs and projects.
- **Portfolio Management.** Provides a real-time view of your organization and supports your strategic, financial, functional, and technical governance requirements.
- **Resource Management.** Enables enterprises to effectively manage resource capacity and allocation.
- **Financial Management.** Offers automatic real-time calculations of costs and variances, resulting in detailed comparisons of project health.
- **Time Management.** Allows resources (users) to use time sheets to report how long they worked on specific work items.
- **Demand Management.** Manages requests from creation to implementation. Each request is processed using a workflow that is represented graphically in the user interface.

Web Services Operations

The supported Web service operations typically include the following categories of services:

- **Create.** Used to create an entity.
- **Get.** Used to return (read) an entity.
- **Set/Update.** Used to revise or remove (update or possibly delete) a field in an entity.
- **Add.** Used to add data to an entity.
- **Delete.** Used to delete an entity.
- **Search.** Used to find a specified detail in an entity.
- **Import/Export.** Used to import the data into (or out of) PPM.

Web Service Special Commands

Selected Web service operations have been incorporated in PPM as special commands. These commands are run through the PPM Workbench. Web service operations can also be run from workflows in the PPM Workbench.

Previously Available Web Services

PPM Web services rely on the Apache Axis Web service framework. PPM versions 6.0 SP4 (and later) and 7.0 relied on the security model available in the Axis1 software and were identical in content and usage. To take advantage of enhanced security features, later versions of the PPM Web services are based on the Axis2 software.

One of the consequences of using the two security models is the division of Web Service Definition Language (WSDL) content. Web service operations that rely on the Axis1 model use a different WSDL file than those using the Axis2 model.

Web Service Operations

Web services operations that were available in the early versions (using Axis1) may have been:

- **Re-implemented.** Starting with version 7.1, many of the version 6.0 and 7.0 Web service operations were re-implemented to take advantage of Axis2 security features. These Web service operations generally have the same name.

Although you may continue to use these version 6.0 and 7.0 Web services, HPE strongly recommends that you convert to the new implementation as soon as practical. Eventually, these versions will be deleted and no longer available for your use.

If you are creating new Web service applications, use the Axis2-based Web services.

- **Deprecated.** Some of the version 6.0 and 7.0 Web service operations are minimally used by PPM customers, or have had their functionality incorporated into version 7.1 or 7.5 Web services (with different names).

These Web services have been retained for interim purposes only. Eventually, these Web services will be deleted and no longer available. Therefore, you should not design long-term solutions that are reliant on these Axis1-based Web services.

- **Replaced.** Some of the version 6.0 and 7.0 Web service operations have been replaced with a later version implementation and the version 6.0 and 7.0 Web service is no longer available for your use.
- **Deleted.** Some of the version 6.0 and 7.0 Web service operations are no longer used and, consequently, are not available in version 7.1, 7.5 and later versions.

Web Services that were supported in previous releases using Axis 1.0 are tagged with "re-implemented", "deprecated", or "replaced" in the "[Web Service Operations and Special Commands](#)" on [page 10](#) section. Although these operations may still be available, we recommend that you use the Axis 2.0-based operations instead.

Web Service Special Commands

Pre-existing Web service special commands may have been:

- **Re-implemented.** Starting with version 7.1, the version 6.0 and 7.0 Web service special commands were re-implemented to take advantage of Axis2 security features. Because these Web service special commands have the same name, additional configuration is required in the `webservices.conf` file.

Although you may continue to use these version 6.0 and 7.0 Web services, HPE strongly recommends that you convert to the new implementation as soon as practical. Eventually, these versions will be deleted and no longer available for your use.

If you are creating new Web service applications, use the Axis2-based Web services.

- **Retained.** These version 6.0 and 7.0 Web service special commands have been retained are available with Axis1 security only. Due to security concerns, these may be deleted in some future

version; however, there currently are no plans to do so.

- **Replaced.** Some of the version 6.0 and 7.0 Web service special commands have been replaced with a later version (Axis2-based) implementation. The Axis1-based special command is no longer available for your use.
- **Deleted.** Some of the version 6.0 and 7.0 Web service special commands are no longer used and, consequently, are not available in later versions.

The following table summarizes the availability of the special commands. For example, if a Web service special command is "re-implemented," it exists (in version 7.5) with both Axis1 and Axis2 implementations.

Table 1-1. Availability and status matrix for Web service special commands

Status	Axis1	Axis2
	6.0 and 7.0	7.1 and later
Re-implemented	Yes	Yes
Retained	Yes	No
Replaced	No	Yes
Deleted	No	No

Related Documentation

The following documentation provides additional information about PPM:

- *What's New and What's Changed*
- *Getting Started*
- Open Interface Guide and Reference
- *Program Management User's Guide*
- *Portfolio Management User's Guide*
- Project Management User's Guide
- Resource Management User's Guide
- *Time Management User's Guide*
- *Demand Management User's Guide*

- *Financial Management User's Guide*
- *Commands, Tokens, and Validations Guide and Reference*

Chapter 2: Web Service Operations and Special Commands

This section introduces PPM application modules with web service support.

Identification and availability of the operations and special commands available in this version of PPM are shown in "Table 2-1. Demand Management Web services" below through "Table 2-8. Time Management Web services" on page 24. The version number identifying when the Web service was introduced has been included to provide historical context.

Demand Management

Table 2-1. Demand Management Web services

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
Web Service Operations					
addRequestNotes	Adds a new note to an existing PPM request	7.1	Yes	No	Yes
createRequest	Creates a new PPM request	7.1	Yes	No	Yes
deleteRequests	Deletes one or more existing PPM requests	6.0	Yes	Yes	Yes
executeWFTransitions	Runs a workflow transition for a PPM request	7.5	Yes	No	Yes

Table 2-1. Demand Management Web services, continued

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
getRequests	Fetches the detail information of one or more existing PPM requests	7.1	Yes	No	Yes
getRequestType Fields ^a	Fetches the description of the fields in an existing request type	6.0	No	Yes	No
getRequestTypesBy FieldGroup ^a	Fetches the list of request types containing a particular field group	6.0	No	Yes	No
importRequest ^b	Creates a new PPM request	6.0	No	Yes	Yes
setRequestFields	Updates one or more simple (token-based) fields in a PPM request	7.1	Yes	No	Yes
setRequestRemote ReferenceStatus	Updates the status of a remote reference for a PPM request	7.1	Yes	No	Yes
updateRemote	The	6.0	No	Yes	Yes

Table 2-1. Demand Management Web services, continued

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
Reference ^c	following: <ul style="list-style-type: none"> • Updates the status of a remote reference for a PPM request • Updates one or more simple fields in a PPM request • Runs one or more workflow transition for a PPM request 				
Special Commands					
ksc_export_fields ^d	Causes the PPM workflow engine to invoke the Web service and update the data of the request on all the remote references associated with the request	6.0	Yes	Yes	Yes

Table 2-1. Demand Management Web services, continued

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
ksc_export_request ^d	Causes the PPM workflow engine to invoke the Web service and create a request	6.0	Yes	Yes	Yes
ksc_export_status_change ^d	Causes the PPM workflow engine to invoke the Web service to update the current status of the request on all the remote references associated with the request, as well as update the specified data	6.0	Yes	Yes	Yes

- a. Deprecated.
- b. Re-implemented as createRequest.
- c. Re-implemented as setRequestRemoteReferenceStatus, setRequestFields, and executeWFTransitions.
- d. To communicate between two PPM instances, you have to configure the webservices.conf file to hold the credential for accessing the remote PPM server.

Financial Management

Table 2-2. Financial Management Web services

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
Web Service Operations					
create ^a	Causes the PPM workflow engine to invoke the Web service and create a new budget	6.0	No	Yes	No
read ^a	Causes the PPM workflow engine to invoke the Web service and fetch an existing budget	6.0	No	Yes	No
update ^a	Causes the PPM workflow engine to invoke the Web service and update an existing budget	6.0	No	Yes	No
createCostRules	Creates one or more new PPM cost rules	7.1	Yes	No	Yes

Table 2-2. Financial Management Web services, continued

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
deleteCostRules	Deletes one or more PPM cost rules	7.1	Yes	No	Yes
getCostFactors	Fetches one or more existing PPM cost factors	7.1	Yes	No	Yes
getCostRules	Fetches details of one or more existing PPM cost rules	7.1	Yes	No	Yes
searchCostRules	Searches for existing PPM cost rules	7.1	Yes	No	Yes
setCostFactors	Sets PPM cost factors	7.1	Yes	No	Yes
updateCostRules	Updates PPM cost rules	7.1	Yes	No	Yes
readFinancialSummary	Fetches a financial summary from PPM Center	8.0	Yes	No	Yes
readFinancialSummarySnapshot	Fetches a financial summary snapshot from PPM Center	8.0	Yes	No	Yes
updateFinancialSummary	Updates an existing	8.0	Yes	No	Yes

Table 2-2. Financial Management Web services, continued

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
	financial summary in PPM Center				
createFinancialSummarySnapshot	Creates a financial summary snapshot in PPM Center	8.0	Yes	No	Yes
readFinancialSummaryACL	Fetches a financial summary access control list (ACL) from PPM Center	8.0	Yes	No	Yes
updateFinancialSummaryACL	Updates a financial summary ACL in PPM Center	8.0	Yes	No	Yes
readFinancialData	Fetches financial data from PPM Center	8.0	Yes	No	Yes
updateFinancialData	Updates financial data in PPM Center	8.0	Yes	No	Yes
createFinancialData	Creates financial data in PPM Center	8.0	Yes	No	Yes
readFinancialDataACL	Fetches a financial data ACL from PPM Center	8.0	Yes	No	Yes

Table 2-2. Financial Management Web services, continued

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
updateFinancialDataACL	Updates a financial data ACL in PPM Center	8.0	Yes	No	Yes
a. Deprecated.					

Portfolio Management

Table 2-3. Portfolio Management Web services

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
Web Service Operations					
createPortfolio	Creates a portfolio in PPM	9.10	Yes	No	Yes
updatePortfolio	Updates the portfolio header details (name, set of managers) for a portfolio	9.10	Yes	No	Yes
readPortfolio	Fetches detail information for an existing portfolio	9.10	Yes	No	Yes
deletePortfolio	Deletes an existing portfolio	9.10	Yes	No	Yes
addPortfolioChildren	Adds one or more child portfolios to a parent portfolio	9.10	Yes	No	Yes
removePortfolioChildren	Removes one or more child portfolios from a parent portfolio	9.10	Yes	No	Yes

Table 2-3. Portfolio Management Web services, continued

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
addPortfolioPrograms	Adds one or more programs to a parent portfolio	9.10	Yes	No	Yes
removePortfolioPrograms	Removes one or more programs to a parent portfolio	9.10	Yes	No	Yes
addPortfolioContent	Adds one or more proposals/projects and assets to a parent portfolio	9.10	Yes	No	Yes
removePortfolioContent	Removes one or more proposals/projects and assets to a parent portfolio	9.10	Yes	No	Yes
Special Commands					
None					

Program Management

Table 2-4. Program Management Web services

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
Web Service Operations					
createProgram	Creates a program in PPM Center	9.10	Yes	No	Yes
updateProgram	Updates an existing program in PPM Center	9.10	Yes	No	Yes
readProgram	Fetches detail information for	9.10	Yes	No	Yes

Table 2-4. Program Management Web services, continued

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
	an existing program				
deleteProgram	Deletes an existing program	9.10	Yes	No	Yes
searchProgram	Searches a program in PPM Center	9.10	Yes	No	Yes
Special Commands					
None					

Project Management

Table 2-5. Project Management Web services

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
Web Service Operations					
addTasksToExistingWorkPlan	Add one or more tasks to the work plan in a project	7.1	Yes	No	Yes
bulkImportProjects ^a	Creates one or more PPM projects and their associated requests in one transaction	7.5	Yes	No	Yes
createBlankWorkPlan	Creates a blank PPM work plan	7.1	Yes	No	Yes

Table 2-5. Project Management Web services, continued

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
createProject ^a	Creates a PPM project and its associated request	7.1	Yes	No	Yes
createWorkPlanFromTemplate	Creates a PPM work plan based on a template	7.1	Yes	No	Yes
executeWorkflowTransition	Runs a single workflow transition for a PPM request	7.1	Yes	No	Yes
exportWorkPlanFromProject	Exports all the tasks in a PPM work plan	7.5	Yes	No	Yes
getProjectDetails	Fetches detail information for an existing PPM project	7.5	Yes	No	Yes
importWorkPlanTasks	Creates a PPM work plan and imports the tasks	7.1	Yes	No	Yes
readTasks	Fetches the task information for one or more existing PPM tasks	7.1	Yes	No	Yes
searchProjects	Searches for existing PPM projects	7.5	Yes	No	Yes

Table 2-5. Project Management Web services, continued

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
searchTasks	Searches for existing PPM tasks	7.1	Yes	No	Yes
updateProject	Updates a PPM project	7.1	Yes	No	Yes
updateTaskActuals	Updates the actuals of PPM task assignments	7.1	Yes	No	Yes
updateWorkPlanStatus	Updates the status of the root task for a PPM project work plan	7.5	Yes	No	Yes
Special Commands					
None					
a. Does not import work plans, budgets, or any other associated entity.					

Resource Management

Table 2-5. Resource Management Web services

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
Web Service Operations					
createResourcePools	Creates one or more PPM resource pools	7.1	Yes	No	Yes
createRoles	Creates new PPM roles	7.5	Yes	No	Yes
createSkills	Creates new PPM skills	7.5	Yes	No	Yes

Table 2-5. Resource Management Web services, continued

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
getResourceParticipation	Fetches resource participation, for an existing resource, in PPM resource pools	7.1	Yes	No	Yes
getResourcePools	Fetches details for one or more existing PPM resource pools	7.1	Yes	No	Yes
searchResourcePools	Searches for existing PPM resource pools	7.1	Yes	No	Yes
setResourceParticipation	Sets resource participation in PPM resource pools	7.1	Yes	No	Yes
updateResourcePools	Updates existing PPM resource pools	7.1	Yes	No	Yes
Special Commands					
None					

Resource Management (Staffing Profile)

Table 2-7. Resource Management Staffing Profile Web services

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
Web Service Operations					
createStaffingProfileHeader	Creates a staffing	7.5 SP5	Yes	No	Yes

Table 2-7. Resource Management Staffing Profile Web services, continued

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
	profile header in PPM				
readStaffingProfileHeader	Fetches a staffing profile header in PPM	7.5 SP5	Yes	No	Yes
updateStaffingProfileHeader	Updates a staffing profile header in PPM	7.5 SP5	Yes	No	Yes
readStaffingProfileACL	Fetches the ACL of a staffing profile header in PPM	7.5 SP5	Yes	No	Yes
updateStaffingProfileACL	Updates the ACL of a staffing profile header in PPM	7.5 SP5	Yes	No	Yes
readPositionLines	Fetches position lines in PPM	7.5 SP5	Yes	No	Yes
addPositionLines	Adds position lines to a staffing profile in PPM	7.5 SP5	Yes	No	Yes
updatePositionLines	Updates position lines of a	7.5 SP5	Yes	No	Yes

Table 2-7. Resource Management Staffing Profile Web services, continued

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
	staffing profile in PPM				
deletePositionLines	Deletes position lines of a staffing profile in PPM	7.5 SP5	Yes	No	Yes
getPositionIdsforStaffingProfile	Fetches position IDs for a staffing profile in PPM	7.5 SP5	Yes	No	Yes
clearStaffingProfileForecastAndAssignment	Clear the future forecast and assignment for a completed staffing profile	9.10	Yes	No	Yes
Special Commands					
None					

Time Management

Table 2-8. Time Management Web services

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
Web Service Operations					
approveTimeSheet ^a	Approves an	7.5	Yes	No	Yes

Table 2-8. Time Management Web services, continued

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
	existing PPM time sheet				
approveTimeSheetLine ^a	Approves an existing PPM time sheet line	7.5	Yes	No	Yes
cancelTimeSheet ^a	Cancels an existing PPM time sheet	7.5	Yes	No	Yes
closeTimeSheet ^a	Closes an existing PPM time sheet	7.5	Yes	No	Yes
createTimeSheet ^a	Creates a new PPM time sheet, including lines and effort data	7.5	Yes	No	Yes
freezeTimeSheet ^a	Freezes an existing PPM time sheet	7.5	Yes	No	Yes
getActualTime	Fetches specified, existing PPM actual time	7.1	Yes	No	Yes
getTimeSheet ^a	Fetches an existing PPM time sheet	7.5	Yes	No	Yes
getTimeSheetPolicy	Fetches an existing PPM time sheet policy	7.5	Yes	No	Yes
read ^b	(not applicable)	6.0	No	No	No
rejectTimeSheet ^a	Rejects an existing time sheet	7.5	Yes	No	Yes
rejectTimeSheetLine ^a	Rejects an existing PPM	7.5	Yes	No	Yes

Table 2-8. Time Management Web services, continued

Name	Description	Introduced in Version	Available in Version 9.40	Available Using Axis1	Available Using Axis2
	time sheet line				
reworkTimeSheetLine ^a	Reworks an existing PPM time sheet	7.5	Yes	No	Yes
searchTimeSheets	Searches for existing PPM time sheets	7.5	Yes	No	Yes
submitTimeSheet ^a	Submits an existing PPM time sheet	7.5	Yes	No	Yes
updateTimeSheet ^a	Updates an existing PPM time sheet, including lines and effort data	7.5	Yes	No	Yes
Special Commands					
ksc_export_actual_time	Causes the PPM workflow engine to invoke the Web service and export the specified, existing PPM actual time	6.0	Yes	No	Yes
ksc_export_actual_time_as_xml ^b	(not applicable)	6.0	No	No	No
<p>a. Improved in PPM Center version 9.10</p> <p>b. Deleted.</p>					

Chapter 3: Accessing Web Services Files and Tools

WSDL and XSD Files

Web Service Definition Language Specification

The Web Service Definition Language (WSDL) specifications used in conjunction with PPM Web services can be found at the following locations on your PPM Server:

- Project Management
`<Host>:<Port>/itg/ppmservices/ProjectService?wsdl`
- Program Management
`<Host>:<Port>/itg/ppmservices/ProgramService?wsdl`
- Portfolio Management
`<Host>:<Port>/itg/ppmservices/PortfolioService?wsdl`
- Demand Management
`<Host>:<Port>/itg/ppmservices/DemandService?wsdl`
- Resource Management
`<Host>:<Port>/itg/ppmservices/ResourceService?wsdl`
- Resource Management (StaffingProfile)
`<Host>:<Port>/itg/ppmservices/StaffingProfileService?wsdl`
- Time Management
`<Host>:<Port>/itg/ppmservices/TimeService?wsdl`
- Financial Management
`<Host>:<Port>/itg/ppmservices/FinanceService?wsdl`

where

<code><Host></code>	represents the host name or IP address where your PPM instance is accessed.
<code><Port></code>	represents the port number where your PPM instance is accessed. <code><Host>:<Port></code> corresponds to the <code>BASE_URL</code> <code>server.conf</code> parameter value and is typically followed by <code>/itg</code> .

Additionally, the WSDL and XSD files are stored in Axis2 archives (.aar files) located on the PPM Server in the `<PPM_Home>/server/<PPM_Server_Name>/deploy/itg.war/WEB-INF/ppmservices` directory.

where

<code><PPM_Home></code>	represents the path where your PPM instance is installed. For example: <code>xyzserver/E/PPMServer</code> .
<code><PPM_Server_Name></code>	represents the name assigned to your PPM Server during installation. For example: <code>xyzProduction</code> . This corresponds to the <code>KINTANA_SERVER_NAME</code> <code>server.conf</code> parameter value and does not necessarily reflect the actual host name of the server.

XML Schema Definition Specification

XML Schema Definition (XSD) specifications that augment the WSDL can be found at the following locations on your PPM Server:

- Project Management
`<Host>:<Port>/itg/ppmservices/ProjectService?xsd=xsd0`
- Program Management
`<Host>:<Port>/itg/ppmservices/ProgramService?xsd=xsd0`
- Portfolio Management
`<Host>:<Port>/itg/ppmservices/PortfolioService?xsd=xsd0`
- Demand Management
`<Host>:<Port>/itg/ppmservices/DemandService?xsd=xsd0`
- Resource Management
`<Host>:<Port>/itg/ppmservices/ResourceService?xsd=xsd0`
- Resource Management (Staffing Profile)
`<Host>:<Port>/itg/ppmservices/StaffingProfileService?xsd=xsd0`

- Time Management

`<Host>:<Port>/itg/ppmservices/TimeService?xsd=xsd0`

- Financial Management

`<Host>:<Port>/itg/ppmservices/FinanceService?xsd=xsd0`

In addition to these XSD files, the following application modules also rely on a “common” XSD file.

- Project Management

`<Host>:<Port>/itg/ppmservices/ProjectService?xsd=xsd1`

- Demand Management

`<Host>:<Port>/itg/ppmservices/DemandService?xsd=xsd1`

- Resource Management

`<Host>:<Port>/itg/ppmservices/ResourceService?xsd=xsd1`

In addition to these XSD files, the following application modules also rely on a “common” XSD file.

- Project Management

`<Host>:<Port>/itg/ppmservices/ProjectService?xsd=xsd1`

- Demand Management

`<Host>:<Port>/itg/ppmservices/DemandService?xsd=xsd1`

- Resource Management

`<Host>:<Port>/itg/ppmservices/ResourceService?xsd=xsd1`

Web Services Toolkit

For your convenience, HPE provides the Web Services Toolkit to decrease Web service application development time.

Accessing Toolkit

To access the Toolkit, use your Web browser to navigate to the following URL:

`<Host>:<Port>/itg/download/webservice/webservice_toolkit.zip`

The files are archived in Zip format and must be extracted before they can be used. The files can be copied to your local PC or workstation—they do not have to be installed on a PPM Server.

There are many ways to create client applications. The Toolkit provides copies of the WSDL and XSD files, along with several libraries, so that you can concentrate on your application's logic rather than worry about the framework.

Toolkit Contents

Although Web services can be implemented using numerous languages, the Toolkit currently provides only Java and .NET examples. These are included in the Toolkit in the following directories:

- java
- MicrosoftDotNet

java Directory

The Java-specific directory in the Toolkit includes the following directories and files:

- bin contains the scripts to set up the compiling and execution environment.
- client
 - src
 - examples contains subdirectories with code samples which can be used as starting point for developing custom client program logic.
 - dm contains an example for Demand Management.
 - fm contains an example for Financial Management.
 - pfm contains an example for Portfolio Management
 - pgm contains an example for Program Management
 - pm contains an example for Project Management.
 - rm contains an example for Resource Management.
 - tm contains an example for Time Management.
 - security contains an example of the callback handler.
- conf contains example configuration files which are required for authentication—these typically

require modification.

- docs
 - javadoc_7.5.zip contains all the PPM version 7.5 javadocs.
 - javadoc_6.0.zip contains the javadocs for the Mercury IT Governance Center version 6.0 and PPM version 7.0 implementations.
- lib subdirectories include all the required libraries for compiling and executing the client code, including the `webservice_client.jar`, which is the stubs generated from WSDL.
- modules contains the rampart and addressing libraries.

MicrosoftDotNet Directory Content

The .NET-specific directory of the Toolkit includes the following directories and files:

- DemandServiceTest contains an example for Demand Management
 - Properties contains Visual Studio and .NET configuration files.
 - Web References
 - localhostDemandService contains WSDL, XSD, and data source files.
- FinancialDataTest contains an example for Financial Management (Financial Data)A
 - Properties contains Visual Studio and .NET configuration files.
 - Web References
 - localhostFinancialData contains WSDL, XSD, and data source files.
- FinancialSummaryTest contains an example for Financial Management (Financial Summary)
 - Properties contains Visual Studio and .NET configuration files.
 - Web References
 - localhostFinancialSummary contains WSDL, XSD, and data source files.
- ProjectServiceTest contains an example for Project Management
 - Properties contains Visual Studio and .NET configuration files.
 - Web References
 - localhostProjectService contains WSDL, XSD, and data source files.
- PortfolioServiceTest contains an example for Portfolio Management

- Properties contains Visual Studio and .NET configuration files.
- Web References
- localhostPortfolioService contains WSDL, XSD, and data source files.
- ProgramServiceTest contains an example for Program Management
 - Properties contains Visual Studio and .NET configuration files.
 - Web References
 - localhostProgramService contains WSDL, XSD, and data source files.
- TimeServiceTest contains an example for Time Management
 - Properties contains Visual Studio and .NET configuration files.
 - Web References
 - localhostTimeService contains WSDL, XSD, and data source files.

Chapter 4: Configuring Web Services on PPM Server

Applicable Standards, Specifications, and Compatibilities

The following standards and environments apply to the Web services implementation:

- Starting with version 7.1, PPM uses the Axis2 Web service framework to leverage the following capabilities:
 - Extensible and modular architecture
 - Very easy-to-define custom message routing
 - Easy addition framework for new WS-* specifications
- Starting with version 7.1, Web services support the following standards:
 - Document/Literal model
 - SOAP 1.1
 - WSDL 1.1 and 2.0 (with some caveats)
 - WS-Security

See the *System Requirements and Compatibility Matrix* for a complete and current list of PPM requirements.

Enabling Web Services

Although automatically installed with PPM, Web services must be enabled before they can be used.

To enable PPM for Web services:

1. (Optional, although highly recommended) Create a backup copy of the `<PPM_Home>/server.conf` file where `<PPM_Home>` represents the location where your PPM instance is installed.
2. Open the `server.conf` file for edit.
3. Enable Web services calls by adding (or modifying) the following setting:

```
com.kintana.core.server.ENABLE_WEB_SERVICES=TRUE
```
4. Save and close the `server.conf` file.
5. Stop, then restart the PPM Server.

Optional Debug Logging Configurations

PPM Web services debug logging can be enabled and disabled. See the following sections for information on enabling and disabling debug logging.

Enabling Debug Logging for Web Services

Debug logging is only needed to help troubleshoot serious problems.

By default, debug logging is disabled.

To enable Web services logging, complete the following steps:

1. Open the `<PPM_Home>/conf/logging.conf` file for edit.
2. Change the logging threshold by verifying (or modifying) the following setting:

```
com.kintana.core.logging.SYSTEM_THRESHOLD = DEBUG
```

If you change the value, make note of its current setting.
3. Enable the logging level for Web services by adding (or modifying) the following setting.

```
com.kintana.core.logging.PRODUCT_FUNCTION_LOGGING_LEVEL = com.mercury.itg.ws,  
DEBUG
```
4. Save and close the `logging.conf` file.
5. Stop, then restart the PPM Server.

Disabling Debug Logging for Web Services

Once your troubleshooting is complete, Web service debug logging should be disabled.

To disable Web services logging, complete the following steps:

1. Open the `<PPM_Home>/conf/logging.conf` file for edit.
2. If you changed the logging threshold in [Step 2 of "Enabling Debug Logging for Web Services"](#), reinstate the previous setting. This parameter is typically set as follows:

```
com.kintana.core.logging.SYSTEM_THRESHOLD = ERROR
```

3. Disable the logging level for Web services by commenting out the parameter as follows:

```
# com.kintana.core.logging.PRODUCT_FUNCTION_LOGGING_LEVEL = com.mercury.itg.ws,  
DEBUG
```

4. Save and close the `logging.conf` file.
5. Stop, then restart the PPM Server.

Web Service Security

Overview of Web Service Security

PPM Web service security includes support for standards for authentication as well as the flexibility to implement HTTP basic authentication and HTTPS. Details for enabling message- and transport-level security, as well as details for integrating with single sign-on software, are discussed in the following sections.

Authentication

PPM Web services use the Web Services Security specification (WS-Security) to secure SOAP message exchanges. PPM Web services rely on a Rampart module integrated with Axis2 Web service engine to provide WS-Security support.

Note: More information about the WS-Security specification can be found at: www.oasis-open.org/specs/index.php#wssv1.1.

The WS-Security specification defines a set of standard SOAP headers to provide quality of protection through message integrity (XML signature), message confidentiality (XML encryption), and single message authentication (UsernameToken authentication, Kerberos authentication, X509 certificate authentication, and so forth). These mechanisms can be used to accommodate a wide variety of security models. The WS-Security specification is considered a message level authentication protocol because all the security information is carried within the SOAP message.

By default, PPM supports WS-Security username token authentication, timestamp validation, and encryption of WS-Security headers.

In addition to WS-Security, PPM also supports HTTP basic authentication (HTTP transport level authentication protocol), as well as HTTPS (secure) authentication.

PPM Web services can also be integrated with third-party single sign-on software such as SiteMinder.

Authorization

PPM Web services follow the same authorization model as Web applications. Refer to the *Security Model Guide and Reference* for details on specific functional areas. This document focuses only on authentication.

Message–Level Security (WS-Security Specification)

Enabling and Disabling Message–Level Security

PPM Web service configuration can be found in following file:

```
<PPM_Home>/server/<PPM_Server_Name>/deploy/itg.war/WEB-INF/conf/axis2.xml.
```

where

<PPM_Home>	represents the path where your PPM instance is installed. For example: xyzserver/E/PPMServer.
<PPM_Server_Name>	represents the name assigned to your PPM Server during installation. For example: xyzProduction.

<i>Name</i> >	This corresponds to the <code>KINTANA_SERVER_NAME</code> <code>server.conf</code> parameter value and does not necessarily reflect the actual host name of the server.
---------------	--

By default, WS-Security authentication is enabled.

In the `axis2.xml` file, the following XML section enables WS-Security.

```
<module ref="rampart" />
<parameter name="InflowSecurity">
  <action>
    <items>
      UsernameToken Timestamp Encrypt
    </items>
    <passwordCallbackClass>
      mercury.itg.ws.core.handlers.security.
      PasswordCallbackHandler
    </passwordCallbackClass>
    <decryptionPropFile>
      service.properties
    </decryptionPropFile>
  </action>
</parameter>
```

To disable WS-Security authentication, comment out all of this XML.

In the `InflowSecurity` section (of the previously described XML), the following three action items are defined:

- **UsernameToken.** Specifies that the UsernameToken security credentials should be expected in received SOAP messages.
The UsernameToken profile defines a set of SOAP headers to carry the username/password from the client to the server.
- **Timestamp.** Specifies that the Timestamp element should be validated. The default clock skew tolerance is five minutes.
- **Encrypt.** Specifies that encrypted messages should be decrypted.

The following example shows a SOAP header that does not include timestamp data or encryption:

```
<soap:Header>
  <wsse:Security xmlns:wsse="http://docs.oasis-open.org/wss/
  2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd"
  soap:mustUnderstand="1">
    <wsse:UsernameToken xmlns:wsu="http://docs.oasis-
  open.org/wss/2004/01/oasis-200401-wss-wssecurity-
```

```
utility-1.0.xsd" wsu:Id="UsernameToken-7433399">
  <wsse:Username>admin
</wsse:Username>
  <wsse:Password Type="http://docs.oasis-open.org/wss/
2004/01/oasis-200401-wss-username-token-profile-
1.0#PasswordText">admin
  </wsse:Password>
</wsse:UsernameToken>
</wsse:Security>
</soap:Header>
```

Timestamp

By default, PPM enables Timestamp validation.

To disable Timestamp validation on the server side, remove the string "Timestamp" from the action items list in the InflowSecurity section, as shown in the following example:

```
<module ref="rampart" />
<parameter name="InflowSecurity">
  <action>
    <items>
      UsernameToken Encrypt
    </items>
    <passwordCallbackClass>
      mercury.itg.ws.core.handlers.security.
      PasswordCallbackHandler
    </passwordCallbackClass>
    <decryptionPropFile>
      service.properties
    </decryptionPropFile>
  </action>
</parameter>
```

Transport-Level Security

HTTP Basic Authentication

In the event it is not convenient to use WS-Security, it is possible to configure PPM to accept user credentials passed using HTTP basic authentication headers.

To enable HTTP basic authentication:

1. Open the `axis2.xml` file for edit.
2. Locate the `InflowBasicAuth` section.
3. Change the value of `Enforced` to `true`.
4. Save and close the `axis2.xml` file.

When HTTP basic authentication is enabled on the PPM Server, the credential carried in HTTP authentication header is authenticated against PPM users' credentials.

Tip: When this mode is enabled, avoid duplication authentication by making sure that you have disabled message-level security, as described in "[Message-Level Security \(WS-Security Specification\)](#)" on page 36.

HTTPS

To enable HTTPS, refer to the external Web server for details. To make a secure HTTPS connection from a Web service client, see the *Web Services Programmer's Guide*.

Integrating with Single Sign-On Software

Like any other PPM Web components, PPM Web services integrate with most industry standard single sign-on (SSO) systems, such as CA SiteMinder, Oracle® Identity Management, RSA Sign-On Manager, and IBM Tivoli Access Manager. Integration is accomplished through a pluggable authentication framework (similar to JAAS) and relies on the authentication framework described in "[Web Service Security](#)" on page 35.

SiteMinder

The following figures show how SiteMinder is used to process authentication requests for PPM.

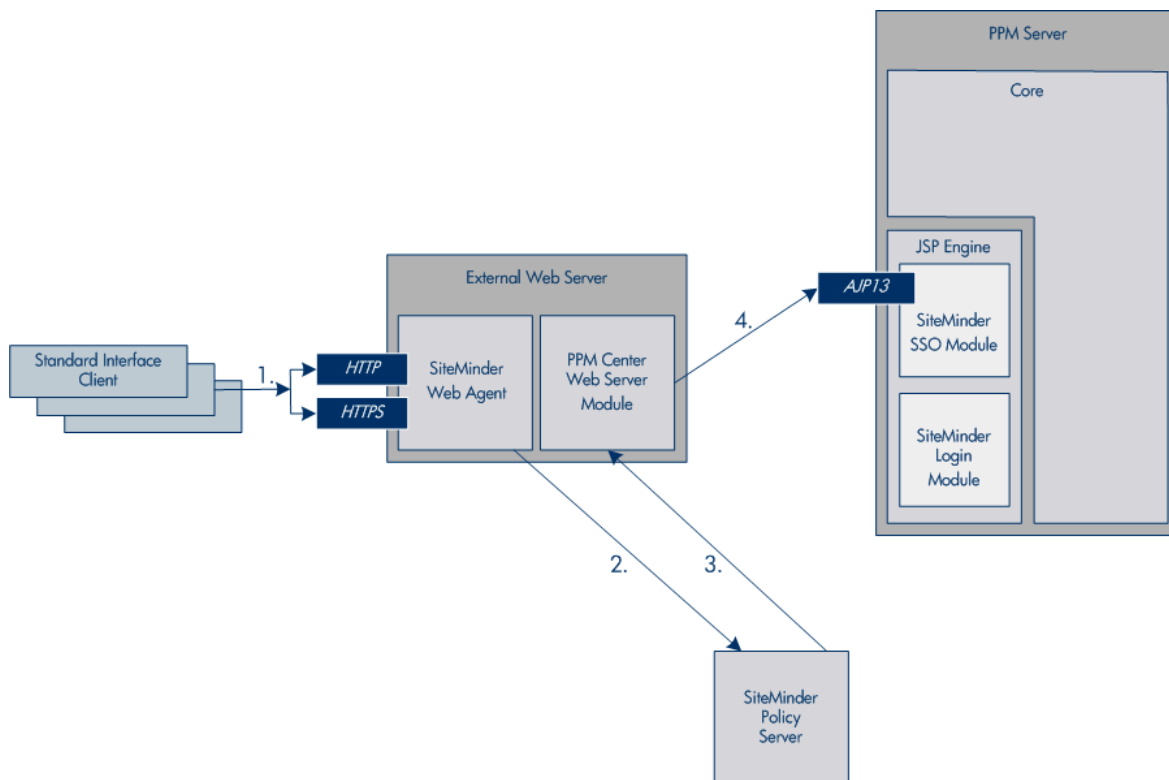
"[Figure 4-1. Web client single sign-on authentication scenario](#)" on the next page shows the steps when a *user* logs onto PPM through the standard interface.

1. An HTTP or HTTPS logon request is made to PPM.
2. The SiteMinder Web Agent intercepts the "protected" user request and redirects it to the Policy

Server.

3. The Policy Server prompts for the username and password, validates the information, and then forwards the request to the PPM Web server module.
4. The Web server module forwards the validated logon request to the SiteMinder SSO module, after which the user is logged onto PPM.

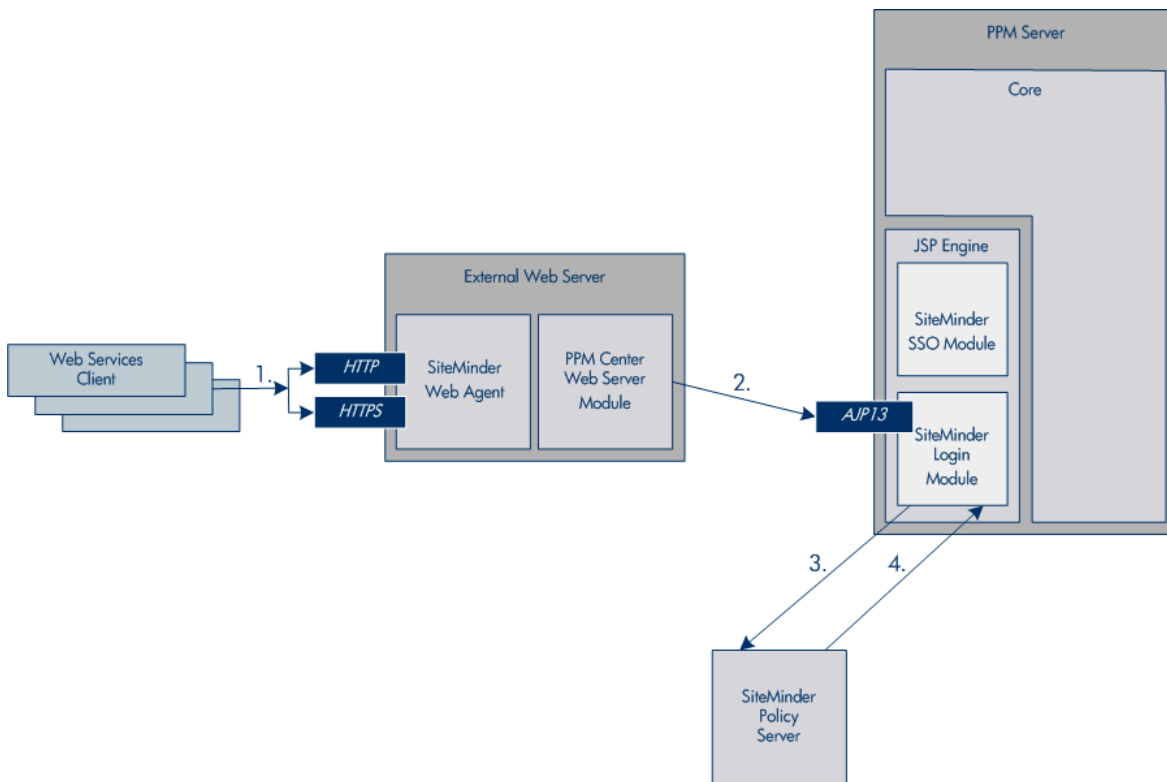
Figure 4-1. Web client single sign-on authentication scenario



"Figure 4-2. Web service client single sign-on scenario" below shows the steps when a *Web service* uses SiteMinder to log onto PPM.

1. A SOAP request is passed to PPM.
2. The SiteMinder Web Agent passes the "unprotected" Web service request to the SiteMinder Login Module (through the PPM Web server module).
3. The SiteMinder Login Agent extracts the username and password from the SOAP header and forwards the information to the SiteMinder Policy Server.
4. The Policy Server validates the information and returns the validated logon request to the Login Module, after which the Web service is logged onto PPM.

Figure 4-2. Web service client single sign-on scenario



SiteMinder Configuration

To configure the SiteMinder for PPM support, complete the following steps:

1. In SiteMinder, add the following sub realms under the PPM main protection realm so that the Web service URLs are unprotected. (The Web service URL would be protected by the custom SiteMinder agent created in the next step.)
 - ppmservices
 - services
 2. Create a new Web agent.
 - Make sure that the 4.x compatibility flag is set.
 - Enter the server name of the PPM Center instance.
 - Enter a secret password.
- Caution:** Remember the agent name and the password since these values are used elsewhere.
3. Create a new Agent Config Object.
 4. Create a new realm for /itg. Choose the agent created in step 2 for this realm.

PPM Server Configuration

To configure the PPM Server for single sign-on support, complete the following steps:

1. Install the SiteMinder Java Agent API for PPM product. Refer to *System Administration Guide and Reference* for details.

```
# Allow SiteMinder Login Module to be invoked for Web service user authentication.  
com.kintana.core.server.ENABLE_WEBSERVICE_SSO=false
```

```
# If SiteMinder is chosen as the only authentication mode, individual user's authentication  
mode #set through workbench's user page would be overwritten by this mode.  
com.kintana.core.server.authethentication_mode=SiteMinder
```

```
# PPM Web application would use single sign-on mode if this parameter is set.  
com.kintana.core.server.SINGLE_SIGN_ON_  
PLUGIN=com.kintana.sc.security.auth.SiteMinderSingleSignOn
```

The authentication mode could be set as Mixed, if needed:

```
com.kintana.core.server.authethentication_mode=ITG, SiteMinder
```

For Web service operations, the Authentication Mode for the Web service user account(s) should be set to SiteMinder. (This is configured from the PPM Workbench **Sys Admin > Users** menu.)

2. To configure PPM Web service to authenticate using SiteMinder, add following parameters to the server.conf file.
3. Set the SiteMinder parameters as detailed in the *Installation and Administration Guide*.

Caution: Use the values for the agent name and the password (established in "[Create a new Web agent.](#)" on the previous page) for the for SM_AGENT_NAME and SM_SHARED_SECRET parameters in the <PPM_Home>/integration/siteminder/siteminder.conf file.

A limitation of the solution is that the user is authenticated to SiteMinder for every Web service call.

Other Single Sign-On Software

To integrate with single sign-on software other than SiteMinder, additional customization might be involved depending on the SSO software deployed.

PPM Web service clients support HTTP basic authentication. Therefore, if the SSO system can be configured to support HTTP basic authentication, this would be the simplest solution. In this case, no customization would be needed, simply pass the users' credential through the HTTP basic authentication header to SSO systems for authentication. Refer to the *Web Services Programmer's Guide* for Web service client configuration details.

The integration can also happen at PPM server side by developing a custom login module (JAAS-like) that can be plugged into PPM. Refer to the *Web Services Programmer's Guide* to learn about developing custom authentication modules.

Send documentation feedback

If you have comments about this document, you can [contact the documentation team](#) by email. If an email client is configured on this system, click the link above and an email window opens with the following information in the subject line:

Feedback on Web Services Guide (Project and Portfolio Management Center 9.40)

Just add your feedback to the email and click send.

If no email client is available, copy the information above to a new message in a web mail client, and send your feedback to your_IE_team_PDL@hpe.com.

We appreciate your feedback!