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# Integration Technologies for Primavera Solutions

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## Introduction

Because project and portfolio management is part of an integrated technical environment, Oracle's Primavera solutions can be configured to interoperate with other applications. To integrate Primavera P6 Enterprise Project Portfolio Management from Oracle, you can choose from four options:

- An integration application programming interface (API)
- Primavera Web Services
- Primavera P6 Reporting Database
- A software development kit (SDK)

To integrate Primavera Contract Management into a complex IT environment, Oracle offers another product-specific API.

All these integration options are built to comply with industry standards and are designed to preserve data integrity, eliminate duplicate data entry, and maximize your investments.

## The Integration Challenge

Companies purchasing software solutions face more technical considerations than ever. Today's complex business processes connect people with information both inside and outside traditional organizational boundaries. Competitive and regulatory pressures force continual changes to improve on existing processes. To avoid restricting the flow of information, the software applications used to facilitate these processes must be flexible.

IT departments are typically required to understand the business processes and set up the technical infrastructure to support them. In the Web 2.0 world of mashups, composite applications, enterprise portals, service-oriented architecture (SOA), business process management, and enterprise resource planning (ERP), this job can be daunting. Fortunately, organizations have been able to successfully solve these challenges, and many of these solutions have become today's technology standards. These standards are the basis for integrating Oracle's Primavera solutions into complex, modern IT environments.

## Integration Methods for Primavera Solutions

Primavera solutions supply several unique integration technologies, each designed to optimally fit your unique business and technical requirements. Leveraging the packaged integration options with either proprietary or commercial middleware tools creates bridges of functionality between deployed enterprise applications and Primavera P6 Enterprise Project Portfolio Management and Primavera Contract Management.

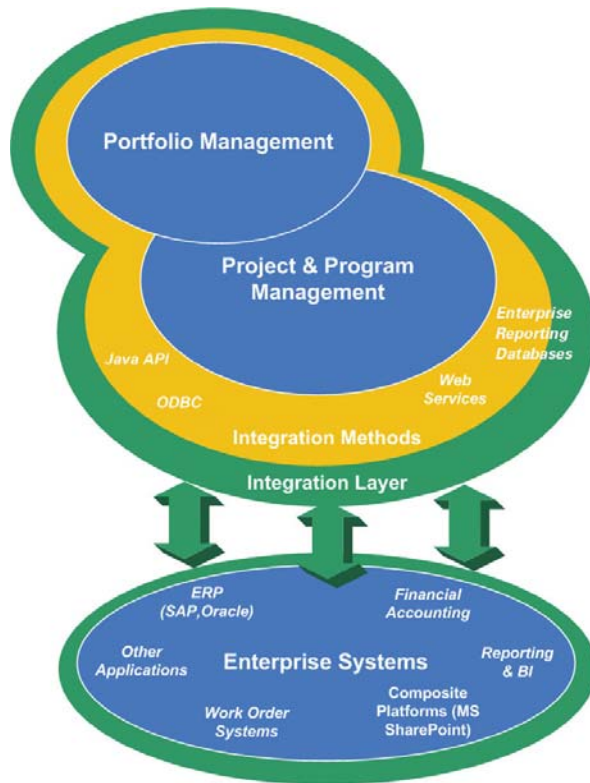


Figure 1. A functional overview of the integration architecture for Primavera solutions

## Integration Application Programming Interface in Primavera P6 Enterprise Project Portfolio Management

Primavera P6 Enterprise Project Portfolio Management's integration API is a bidirectional gateway for seamlessly connecting to data and business functions. This Java-based API leverages an object-oriented business rules engine and has been architected to provide scalability, security, and performance. Deploying custom solutions is a simple process that involves writing Java code that uses a few Oracle-provided Java classes. The flexible API can be run as a simple standalone utility or through an application server to support complex and even remote technical environments.

The integration API provides scalability, security, and performance for real-time application integrations; integrates with large, complex data sets; and supports simple, standalone applications through complex remote integrations.

A classic example of the Java API is provided by the integration of a work order system and a financial accounting system with Primavera P6 Enterprise Project Portfolio Management.

The API enables projects and activities to be created in the work order system. They are then automatically sent to Primavera P6 Enterprise Project Portfolio Management for scheduling. Once the projects and activities are scheduled, the integration API passes the start and projected finish dates back to the work order system. As

received invoices are paid and tracked within a financial accounting system, the integration API links the actual costs to the appropriate resources in Primavera P6 Enterprise Project Portfolio Management. By linking these costs to the schedule, the product is able to calculate and report on actual project costs for any given cost account.

## Primavera Web Services

Similar to the integration API, Primavera Web Services extends the functionality and business objects from Primavera P6 Enterprise Project Portfolio Management. An integration technology, Primavera Web Services is based on a core set of standards, including Extensible Markup Language (XML) for representing data, Simple Object Access Protocol (SOAP) for data exchange, and Web Services Description Language (WSDL) for a description of the capabilities of Web services.

Primavera Web Services integrates Java and .NET applications with platform-agnostic Web services; integrates with composite applications, SOA environments, and BPEL; and works with most middleware integration tools.

The main advantage of Primavera Web Services over the integration API is interoperability. Functionality extended through Primavera Web Services will operate with any type of technical platform, from Java to Microsoft .NET. Primavera Web Services can be used for traditional integrations and also offers a variety of new capabilities. For example, a complementary technology such as Business

Process Execution Language (BPEL) is used to orchestrate Web services in automated workflows. Primavera Web Services is also used in hybrid applications called mashups to combine the data and functionality of multiple Web applications into a single, integrated tool.

Many companies have chosen to deploy Microsoft SharePoint as their enterprise collaboration and document management platform. Primavera Web Services is an ideal integration technology for extending the functionality and data from Primavera P6 Enterprise Project Portfolio Management into the SharePoint environment. SharePoint Web parts—or graphical portlets—can be created for project members. These provide visibility into key performance indicators—schedule statistics, variances, milestones, and risks—from Primavera P6 Enterprise Project Portfolio Management. In addition to viewing data from Primavera P6 Enterprise Project Portfolio Management in SharePoint, interactions such as progressing an activity are also possible.

## Primavera P6 Reporting Database

Primavera P6 Reporting Database is a great option for complex reporting and business intelligence requirements. It employs a proprietary extract, transform, and load (ETL) process that moves data from Primavera P6 Enterprise Project Portfolio Management into two components: the operational data store (ODS) and the project star schema. Designed for day-to-day operational reports, the ODS is a denormalized version of the project management database within Primavera P6 Enterprise Project Portfolio Management. The project star schema supplies

a dimensional schema enabling business analysts to slice and dice through project data to uncover trends.

Primavera P6 Reporting Database supplies operational, day-to-day data with a denormalized version of the project management database and provides BI capabilities and data snapshots with a dimensional star data schema.

The open architecture of Primavera P6 Reporting Database enables users to create custom operational reports and business intelligence analysis, using any third-party reporting tool. In addition to report creation, Primavera P6 Reporting Database offers a

unique integration path. For example, dashboards and Web reports can be created from Primavera P6 Reporting Database and extended into portal systems or even back into Primavera P6 Enterprise Project Portfolio Management.

### Software Development Kit

The Primavera software development kit (SDK) enables users to integrate data from Primavera P6 Enterprise Project Portfolio Management with external databases and applications through a simple programming interface. The SDK supports the Open Database Connectivity (ODBC) standard and ODBC-compliant interfaces, such as Object Linking and Embedding Database (OLE-DB) and Java Database Connectivity (JDBC), for connecting to the project management database. The SDK is a great choice for working with small data sets and executing simple tasks, such as loading global data from applications such as Microsoft Excel or generating basic reports. The SDK is a solid option for executing simple tasks.

### Primavera Contract Management's Application Programming Interface

The API in Primavera Contract Management is a series of XML requests and responses that combine to form a model exposing data and functionality from Primavera Contract Management. Primavera Contract Management's core consists of middle-tier components. These components run on a Web server and an application server that is Java 2 Platform, Enterprise Edition (J2EE)-compliant. Together they provide a fully scalable mechanism for interacting with the Primavera Contract Management database that enforces all the business rules, independent of the user interface.

For example, a large construction owner requires all vendors to receive approval from the state they operate in before bidding on projects. Contractors submit an application form on the owner's Web site, outlining their state certifications and proposal details. Once submitted, the form is routed through an internal approval system. If the contractor is approved, its details are sent by the XML API to the Primavera Contract Management group list for assigning jobs to projects.

In another example, an owner approves project budgets, using a third-party financial system. When the budget is approved, the XML API creates projects in Primavera Contract Management, following a financial code structure. Contracts are created—by use of the group list

via the vendor approval process described above—and cost worksheets are built with planned-to-commit values populated from the financial system.

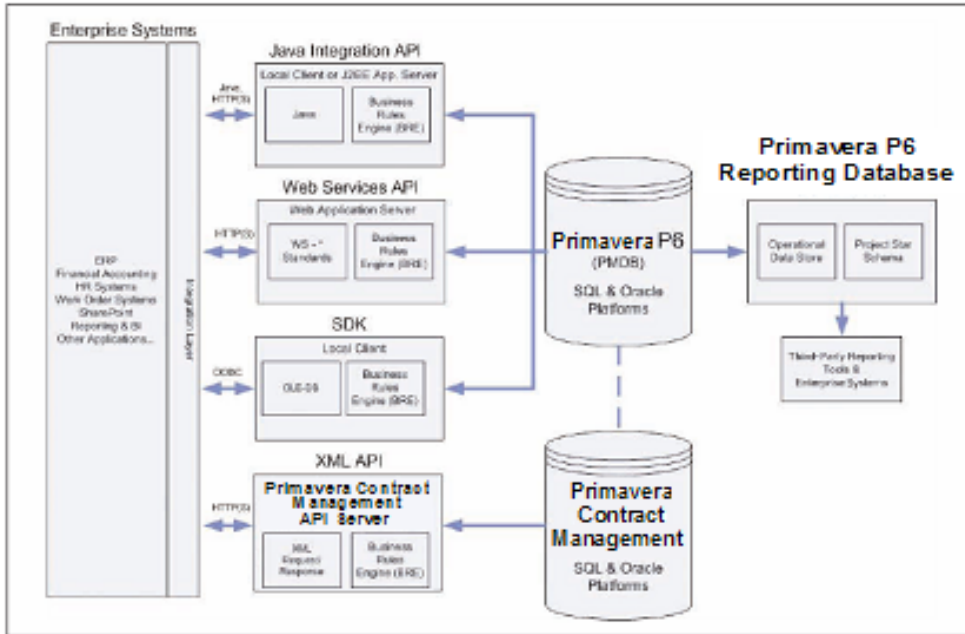


Figure 2. A technical overview of integration paths for Primavera P6 Enterprise Project Portfolio Management and Primavera Contract Management

## Conclusion

The technologies discussed here enable you to integrate Oracle’s Primavera solutions into even the most modern, complex enterprise IT environments.

## About Oracle’s Primavera Solutions

Oracle is the leading worldwide provider of project portfolio management solutions for project-intensive industries. Its Primavera project portfolio management software helps companies propose, prioritize, and select project investments and plan, manage, and control the most-complex projects and project portfolios.



## Appendix 1: Summary of Integration Technologies for Primavera Solutions

The following table summarizes the key features of each of the integration technologies discussed in this white paper.

**TABLE 1. SUMMARY OF INTEGRATION TECHNOLOGIES FOR PRIMAVERA SOLUTIONS**

| <b>Integration API for Primavera P6 Enterprise Project Portfolio Management</b> |   |
|---|---|
| Description   | Leverages a business rules engine to extend data and functionality from Primavera P6 Enterprise Project Portfolio Management to other enterprise applications   |
| Features  | <ul style="list-style-type: none"> <li>• Provides scalability, security, and performance</li> <li>• Supports simple standalone applications through complex remote integrations</li> <li>• Integrates with large, complex data sets</li> <li>• Provides high performance and real-time application integrations</li> <li>• Offers proven integrations with work order, financial, and ERP systems</li> </ul>  |
| <b>Primavera Web Services</b>   |   |
| Description   | Extends data and functionality from Primavera P6 Enterprise Project Portfolio Management to other enterprise applications   |
| Features  | <ul style="list-style-type: none"> <li>• Integrates Java- and .NET-based applications with platform-agnostic Web services</li> <li>• Integrates with composite applications, SOA environments, BPEL</li> <li>• Offers ease of use by working with many middleware integration tools</li> </ul>  |
| <b>Primavera P6 Reporting Database</b>  |   |
| Description   | <p>Uses a proprietary ETL process to persist data from Primavera P6 Enterprise Project Portfolio Management into two databases.</p> <ul style="list-style-type: none"> <li>• Has an operational data store that is a denormalized version of the project management database</li> <li>• Has a project schema database that supplies a dimensional star schema of project-related data</li> </ul>  |
| Features  | <ul style="list-style-type: none"> <li>• Integrates with any third-party reporting tool</li> <li>• Supports Oracle and SQL database types</li> <li>• Facilitates creation of Web-enabled reports and dashboards, using a third-party reporting tool</li> <li>• Supports complex custom reporting and business intelligence requirements</li> <li>• Supplies operational, day-to-day data</li> <li>• Provides business intelligence capabilities and can take snapshots of data over time</li> </ul> |

**Software Development Kit**

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Description Provides straightforward integrations, including loading global data for conversions

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- Features
- Facilitates reports with project, activity, or assignment spread data
  - Connects to the project management database via ODBC-compliant interfaces such as OLE-DB and JDBC
  - Offers a utility tool perfect for small data sets
- 

**API for Primavera Contract Management**

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Description Links external systems and Primavera Contract Manager for pushing and pulling data

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- Features
- Forms a model exposing Primavera Contract Manager data and functionality with XML requests and responses
  - Allows for customized data entry and reporting
-



Integration Technologies for  
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