

Microsoft® Business Solutions Project Management and Accounting

Planning a Successful Deployment



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Overview of Microsoft® Business Solutions Project Management and Accounting

The Microsoft Business Solutions Project Management and Accounting solution provides a means for controlling costs and scheduling to many organizations, whether they view themselves as “project-driven” or not. Organizations that need to schedule, track, bill, and/or analyze discrete units of work can benefit from this functionality.

With Microsoft Project Management and Accounting, project-driven organizations can increase efficiency and profitability. Automated processes streamline accounting, billing, and reporting for all project-related activity. Whether employees are working onsite or remotely, they will be able to update and analyze project information via their Web browser. By connecting project and financial data between Microsoft Solomon and the Microsoft Office Project Enterprise Project Management solution, stakeholders can make plans quickly, allocate and manage resources from a centralized source, and analyze project stages and profitability with complete confidence. This solution provides financials, time, expense, billing, revenue recognition, scheduling, resource assignment, reporting, and analytics in a connected set of applications.

The purpose of this document is to provide partners with guidance on the deployment and configuration of the joint Microsoft® Solomon and Microsoft® Office Project 2003 solution.

The Project Management and Accounting Solution Components

Microsoft Project Management and Accounting-Solomon is an interconnected suite of modules within the Microsoft Solomon product that provide financial accounting, project management, and resource management capabilities for small and mid-market segment organizations. Key capabilities include time and expense management, billing, revenue recognition, cost allocations, contract management, payroll reporting, employee and resource utilization, and real-time project profitability analysis. Built on Microsoft technologies and backed by the expertise of Microsoft Certified Business Solutions Partners and independent software vendors, this flexible solution adapts quickly to changing business conditions to help improve project efficiency and profitability and build customer satisfaction.

Depending on business need, companies can optimize project planning and execution by working in both Microsoft Solomon and the enterprise project management version of Microsoft Office Project, with information flowing automatically across applications. This powerful interconnected capability enables project managers and accounting staff to combine real-time financial data with best-of-breed project planning, task scheduling, knowledge management, and skills management capabilities.

Microsoft Project Management and Accounting-Solomon is fully integrated with the other suites in Microsoft Solomon including financial management, field service management, distribution, and Microsoft Business Portal modules. Microsoft Project Management and Accounting can be the engine of an end-to-end business solution that reaches beyond organizational boundaries to improve collaboration with customers, partners, and suppliers.

Microsoft Business Solutions-Solomon

- Microsoft® Business Solutions Foundation-Solomon: The engine that powers the Solomon application modules consists of the Customization Manager, System Manager, and Shared Information modules
- Microsoft® Business Solutions for Financial Management-Solomon: The core financial capabilities are provided in the General Ledger, Accounts Payable, Accounts Receivable,

Cash Manager, Payroll/Direct Deposit and Advanced Payroll, Multi-Company, Currency Manager, and Financial Statement Translation modules

- Microsoft® Business Solutions for Project Management and Accounting-Solomon: The core Project Accounting functions that integrate directly with the financials include [Project Controller](#), [Time and Expense for Projects](#), [Analyzer](#), [Allocator](#), [Flexible Billings](#), [Communicator](#), [Employee Utilization](#), [Project Budgeting](#), and [Contract Management](#) modules
- Microsoft® Business Solutions for Analytics: FRx® Reporter, FRx Forecaster, and Business Objects Crystal Reports® .
- Microsoft® Business Solutions Business Portal: The application pages in the Project Self Service suite include Timecard Entry, Expense Report Entry, Line Item Approvals, Document Approvals, and Project Analyst

Additional Microsoft Solomon Components

- Microsoft® Business Solutions for Distribution-Solomon: Order Management, Inventory, Purchasing, Inventory Replenishment, Order to Purchase, Landed Cost, and Advanced Shipment Management modules
- Microsoft® Business Solutions for Manufacturing-Solomon: Bill of Material and Work Order modules
- Microsoft® Business Solutions for E-commerce-Solomon: Application Server, eCommerce Gateway - Electronic Data Interchange (EDI) Edition, and Web Order modules
- Microsoft® Business Solutions for Field Service Management-Solomon: Service/Dispatch, Equipment Maintenance, Service Contracts, and Flat Rate modules

Microsoft Office Project

- [Microsoft® Office Project Professional](#): Desktop application for project planning and resource scheduling (required to create new projects in Microsoft Office Project Server)
- [Microsoft® Office Project Server](#): Built on Microsoft® SQL Server, Microsoft® Project Server powers company-wide resource management, project scheduling, reporting, analysis, and knowledge management via Microsoft Windows® SharePoint Services integration. Project plans, templates, and resources are stored in Project Server for access within Business Portal and Microsoft Project Professional
- [Microsoft® Project Web Access](#): The Web interface to Microsoft Project Server allows view, update, and reporting capabilities on Project Server data for team members, executives, and business managers. Requires client access licenses (CALs) for Project Server

Microsoft Business Solutions for Project Management and Accounting-Solomon Modules

Microsoft Business Solutions for Project Management and Accounting-Solomon consists of the following modules:

Project Controller

Design your projects to match the way you do business and then track, view, and analyze costs, revenues, and margins within one solution that integrates and updates project information across your entire business, enabling accountants and project managers to leverage the same information for better analysis and project accountability.

Allocator

Gain precise control over project finances by creating flexible, multi-tiered hierarchies to reflect the spectrum of labor rates and billing structures you need. Then, automatically mark up costs, allocate charges and revenues, account for work-in-process, transfer or consolidate transactions, and record accurate data for billing and posting to general ledger accounts.

Time and Expense for Projects

View and track labor, travel, and other expenses with a fully integrated solution that allows you to include out-of-pocket costs in project profitability calculations. Using the Web-based capabilities provided in Microsoft Business Portal, employees can record their time and expenses anytime, anywhere.

Flexible Billings

Shorten billing cycles and improve cash flow by taking control of unbilled receivables and converting them more quickly to revenue and cash. Streamline invoicing with automatic generation, formatting, and submission of drafts for approval. Then, easily note needed corrections, finalize invoices, and post receivables.

Analyzer

Enhance business decision-making with efficient access to integrated information about project performance, profitability, aging of billed and unbilled accounts receivable, and budget/actual comparison including purchase order, labor, and subcontract commitments. Quickly collect and summarize data for key metrics, selectively pinpoint details for analysis, and present results in intuitive and practical formats.

Project Budgeting

Take control of your project finances with powerful tools for creating budgets, managing change orders and revisions, and comparing budget details to actuals. By tracking your budgeting process throughout the life of your project, you can view the impact of budget changes on profitability and manage the information you need to improve success for current and future projects.

Contract Management

Streamline time-consuming contract management tasks and increase the productivity of subcontractor interactions for even the most complex projects. By improving control over change orders, document and payment tracking, and subcontractor disbursements, you can help ensure timely completion, enhance cash flow, and boost project profitability.

Employee Utilization

Maintain tight control over the information you need to improve the profitability of service professionals and other human resources. Track personnel productivity, billable time, revenues, and the realization of established utilization goals. View timecard line-item detail or speed up analysis by customizing and summarizing data in a variety of groupings and time intervals.

Communicator

Enhance communication and control over project progress and profitability by increasing awareness of changes in key indicators or documents awaiting action. Automated alerts keep you informed of pending deadlines, required approvals, escalating costs, and eroding margins, making it easy to intervene so that projects and profits stay on track.

Microsoft Business Solutions Business Portal

The Microsoft Business Solutions Business Portal provides user-specific access to information and processes from a single Web-based portal. Built on Microsoft Windows SharePoint Services and Microsoft .NET technologies, Microsoft Business Portal integrates seamlessly with Microsoft Solomon to deliver applications, information, and processes to employees across the company and around the world. The key elements of Business Portal include:

Business Portal Increases the Availability of Information

- Publish project profitability reports, sub-contractor reports, outstanding purchase orders, and budget reports online.
- Run queries to access detailed information about projects, customers, vendors, inventory items, sales, and purchases. Modify and export queries to Microsoft Office Excel for further analysis or to share with others.
- Define and deliver access to personalized views of key business information using Key Performance Indicators for Microsoft Business Portal.
- Deliver role-based information to project managers, salespeople, purchasing agents, budget managers, and any other role you create.

Business Portal Enables Employees to Complete Common Tasks More Efficiently

- Deliver access to Web-based applications such as project time and expense entry, project profitability analysis, and all Microsoft Project Web Access functions.
- Workflow management improves efficiency for routine processes such as timecard and expense report approval.

Business Portal Delivers Web-browser Access to the Microsoft Solomon Applications

- Access any Microsoft Solomon window via Windows Terminal Services.
- Create links to commonly used windows so that users can easily access the windows they use most often to do their jobs.

Microsoft Office Project

Microsoft Office Project provides an infrastructure that supports core business processes and is flexible enough to accommodate evolving processes, so your organization can gain visibility, insight, and control of its portfolio of projects, as well as improve productivity, reduce cycle times, decrease costs, and increase quality. The solution has two main components: Microsoft Office Project Professional and Microsoft Office Project Server.

Project Professional 2003

Microsoft Project Professional 2003 is a desktop project management application that integrates with Microsoft Office Project Server 2003. Project Professional 2003 provides all the capabilities in Project Standard 2003. In addition, when used with Project Server 2003 and Microsoft Office Project Web Access, it provides extended Project Management capabilities such as up-to-date information about resource availability, as well as resource skills and project status.

When integrated with Microsoft Project Management and Accounting-Solomon, Microsoft Project Professional gains enhanced functionality, such as the capability to create and manage a project that is synchronized between the two systems using a shared resource pool, as well as the ability to maintain budgets and see revenue at the project or task level.

Project Server 2003

Microsoft Project Server 2003 is the flexible platform that supports the portfolio management, resource management, and collaboration capabilities in Microsoft Project. Project Server 2003 enables organizations to store project and resource information centrally and consistently. It also integrates with Microsoft Windows® SharePoint™ Services for file management and collaboration capabilities, helping team members to work together more effectively.

Users can connect to Project Server 2003 using Project Professional 2003 (desktop program) or Project Web Access (Web portal) to save, retrieve, and interact with Project Server data. Users can also use Microsoft Office Outlook® 2003 to download their tasks from Project Server 2003, providing easy access to crucial information using a single, familiar interface.

When integrated with Microsoft Project Management and Accounting-Solomon, Project Server maintains integrated resources, sends project and task information to the Microsoft Solomon system, and receives project cost and revenue information from the Microsoft Solomon system.

Project Web Access

Project Web Access is the Web portal that enables you to connect to the project and resource information stored in Project Server and to collaborate on projects. Team members, executives, and resource managers – in other words, any stakeholder who needs access to Project Server 2003 information but does not require the scheduling capabilities of Project Professional – can use Project Web Access through a Web browser to view, update, and analyze information. All Project Web Access functionality is accessible from within Microsoft Business Solutions Business Portal for a more integrated browser-based experience.

Note: Project Web Access is not a separate product. Rather, it is enabled by Project Server 2003 and acts as the Web portal, providing Web components for other Web applications like Business Portal. You must have a Project Server 2003 Client Access License (CAL) to use Project Web Access.

When integrated with a Microsoft Project Management and Accounting solution using Business Portal, Project Web Access Web Parts are integrated seamlessly into the project area of the portal. In this way, project accounting and project management capabilities for team members, resource managers, project managers, and executives appear together in one portal for easy access.

Component Details

You can find detailed information about each of the components by clicking the following links:

- Microsoft Office Project
<http://office.microsoft.com/home/office.aspx?assetid=FX01085795>
- Microsoft Enterprise Project Management Solution
<http://www.microsoft.com/office/project/prodinfo/EPM/guide.mspx>
- Microsoft Office Project Server 2003 Configuration Planning Guide
<http://go.microsoft.com/fwlink/?LinkID=20235>
- Microsoft Windows SharePoint Services
<http://www.microsoft.com/WindowsServer2003/technologies/sharepoint/default.mspx>
- Microsoft SQL Server 2000
<http://www.microsoft.com/sql/>
- Microsoft Windows Server 2003
<http://www.microsoft.com/windowsserver2003/evaluation/overview/standard.mspx>

- Microsoft Business Solutions Solomon Project Accounting
<http://www.microsoft.com/BusinessSolutions/Project%20Management/Solomon/default.aspx>
- Additional Solomon White Papers (primarily technical):
<https://mbs.microsoft.com/partnersource/products/solomon/documentation/whitepapers>
- Additional Solomon Fact Sheets (for the modules):
<https://mbs.microsoft.com/partnersource/products/solomon/sales/salestools/productfactsheets>
- Microsoft Business Solutions Business Portal
<http://www.microsoft.com/businesssolutions/business%20portal/default.aspx>

You can find detailed information about the Project Management and Accounting solution integrated with Microsoft Office Project by clicking the following links:

- Project Management and Accounting integrated with Microsoft Office Project: Overview and Implementation
<https://mbs.microsoft.com/partnersource/products/solomon/documentation/userguides/>
- Project Management and Accounting integrated with Microsoft Office Project: Mapping Tasks
https://mbs.microsoft.com/partnersource/products/solomon/documentation/whitepapers/sol_mapping_tasks_wp.htm

Project Management and Accounting: Planning

Understanding Availability

Availability refers to a system or component's ability to respond to user input regardless of the situation. That is, the system or component is available to users, even during planned downtime or catastrophe. Availability is often bound to scalability. The fact is that a system can be extremely scalable without meeting availability requirements and can be seamlessly available without the capacity to scale. Availability is sometimes considered a factor in only the largest organizations, but it is actually important to organizations of any size. The two main factors that dictate the need for availability are:

- **Users dispersed across time zones** A high-availability configuration may be required if your organization's users are located across different time zones. A single-site workday is typically eight to ten hours long. For the IT professional supporting the components of a single-site installation, there is ample time for system maintenance and other planned downtime. When users are geographically located in multiple time zones, the "workday" is much longer. If users are located in Asia, North America, and Europe, the workday is virtually the entirety of a single day. This leaves little time for regular maintenance.
- **Application criticality** A high-availability configuration is also required if your organization cannot afford planned or unplanned downtime to any system components.

Understanding Scalability

Scalability is typically thought of as a system or component's ability to accommodate greater demand while maintaining an acceptable response time for users. This is important when an organization plans for anticipated future growth. In addition to planning for growth, it is also important to deploy an appropriately sized configuration that accommodates an organization's initial performance requirements.

Planning for scalability involves determining whether the system can be deployed at a large enough scale to meet the needs of the mid-market organization. The Microsoft Project Management and Accounting solution is a multi-tiered infrastructure, meaning you can plan for and manage the performance of each component within each tier, making it a highly scalable system. To accomplish this and to avoid potential bottlenecks, you must make the proper design decisions up front.

There are two primary methods for accomplishing a scaled infrastructure: scaling up and scaling out. Each scaling method requires an understanding of the bottlenecks and applications within each tier. In a typical Project Management and Accounting deployment, the largest number of users will access web-based functionality, the second largest set of users will access the Microsoft Project Professional client to Microsoft Project Server, and the smallest number of users will access the Microsoft Solomon client. The solution is therefore designed to have the greatest scaling capabilities for web functionality, some scaling capabilities for Microsoft Project, and the least scaling capabilities for Solomon.

Scaling Up

Scaling up is accomplished by adding resources to an existing single computer. The most common ways to do this are by adding memory and using more or faster CPUs. There are limitations to how an application server can be scaled up. For example, you must ensure that the version of Windows Server running on the computer will support additional CPUs.

You will also need to ensure that the hardware will support scaling up. Even if the version of Windows Server supports eight processors, if the computer on which it is installed supports only four, you will be unable to scale up beyond four processors.

The following table lists the scale-up limits for processors and memory on supported versions of Windows Server.

Windows Server version	Maximum CPUs	Maximum RAM
Windows 2000 Server	4 Processors	4 gigabytes (GB)
Windows 2000 Advanced Server	8	8 GB
Windows 2000 Datacenter Server	32	32 GB
Windows Server 2003 Web Edition	2	2 GB
Windows Server 2003 Standard Edition	4	4 GB
Windows Server 2003 Enterprise Edition	8	32 GB
Windows Server 2003 Datacenter Edition	32	64 GB

Further scale-up considerations may be achieved on a computer running SQL Server 2000 by using a 64-bit edition of Windows Server 2003 Enterprise Edition or Windows Server 2003 Datacenter Edition.

Note: The non-database components of Microsoft Project Management and Accounting are not supported on a 64-bit computer.

Scaling Out

Scaling out is accomplished by deploying additional computers on the system, either by creating a load-balanced cluster to distribute load or by offloading components and services to additional computers.

Offloading

Offloading is another method of scaling out your Project Server deployment. Project Server includes several integrated components and services that provide important project management features and functionality. These are installed by default on the computer running Project Server but in larger deployments can be installed on separate computers. Solomon does not support offloading.

Understanding Project-Related Networking Concepts

In order to meet the availability and scalability needs of some organizations, some of the applications and components in the Microsoft Project Management and Accounting solution can be deployed in load-balanced or failover clusters. This section discusses these networking concepts.

Load Balancing

Load balancing is a clustering technique whereby you deploy similarly configured computers together in a clustered relationship, improving server performance and availability. A load-balanced cluster is a group of identical servers, or nodes, that are accessed as though they were a single server. As requests are made to the cluster, they are handled by the node with the greatest availability, providing faster response times to clients. In addition to performance gains, load balancing also provides fault tolerance. If any server in the cluster becomes unavailable, either for planned or unplanned reasons, the other nodes in the cluster continue servicing requests. Microsoft® Business Portal, Microsoft® Office Project Server 2003, and Microsoft Windows® SharePoint™ Services can be deployed in this manner. Microsoft Solomon does not support load balancing at this time.

Distributing the requests across a load-balanced cluster can be accomplished by using software or by employing a hardware method, such as a router or switch. The Microsoft Windows Network Load Balancing service provides a software-based option for load balancing computers that are running Project Server and Window SharePoint Services. The Network Load Balancing service distributes client requests among multiple computers, thereby spreading the processing load required to service the requests. When deployed in a load-balanced cluster, the individual computers operate as a single virtual server. Balancing the incoming request load can dramatically improve application performance, provided other architectural bottlenecks such as memory are also accounted for.

Failover Clustering

Failover clustering can be used with a database stored in Microsoft SQL Server™ 2000 or with the online analytical processing (OLAP) features that are part of SQL Server Analysis Services. Failover clustering is a process in which the operating system and SQL Server work together to provide availability in the event of an application failure, hardware failure, or operating system error.

Each node in the cluster is identical but deployed with at least one active node. Additional nodes can be added to the cluster as active or passive participants. For example, in a two-node cluster, the two computers running SQL Server can be deployed in an active-passive relationship, the active SQL Server services all requests on the network, and the passive server only handles requests if the active server becomes unavailable.

This redundancy helps ensure database availability in the event of planned or unplanned downtime. It is important to note that, like load balancing, failover clustering can provide performance benefits by deploying additional active nodes to the cluster. Gains in performance can also be realized when the computer running SQL Server is scaled up by adding additional processors or memory.

Failover clustering can be used for the Microsoft Project Server and Windows SharePoint Services databases. Failover clustering is not currently supported for Microsoft Solomon databases. Failover clustering is only supported in SQL Server Enterprise Edition when installed on a computer running one of the following Windows Server editions:

- Windows 2000 Advanced Server
- Windows 2000 Datacenter Server
- Windows Server 2003 Enterprise Edition
- Windows Server 2003 Datacenter Edition

Understanding Architectural Considerations

This section discusses the various architectural considerations you must understand when planning for a Project Management and Accounting solution based on Microsoft Solomon and Microsoft® Office Project Server 2003, and what impact these considerations have on hardware choices, configuration decisions, and performance. These include:

- Project variables, such as the number, size, and duration of projects
- Types and number of users for whom the system is designed
- Type of project management employed
- Features installed

Number of Users

The number of users in your organization that will use Project Management and Accounting features has a direct effect on your organization's scalability and performance needs. Beyond the total number of users, consider also the maximum number of concurrent users. Further, this guide recommends categorizing users roughly into business managers, project managers, resource managers, team members, and viewers.

User Types

A Microsoft Project Management and Accounting solution provides tools for different types of users in different job functions. The following sections describe the most common: project financial managers, project managers, resource managers, resources, viewers, and administrators.

Project Financial Managers

Project Financial Managers are responsible for all of the financial aspects of a project. They start with the project budgeting process, then track costs and revenue on a project-by-project basis. They make sure that revenue is allocated correctly and that costs are tracked by the correct cost categories. Project Financial Managers may also have responsibility to approve project costs like overhead, resource time, resource expense and other purchases. Project Financial Managers may also produce, approve, and manage the bills that are sent to customers.

Project Financial Managers use Solomon for:

- Project budgeting
- Project activation
- Revenue recognition and allocation
- Billings

Project Financial Managers use Business Portal for:

- Viewing project financial data such as project and task net profit and AR aging
- Approving project resources' time and expenses

Project Managers

Project managers are responsible for overseeing and completing projects, sometimes coordinating with other project managers and resource managers in the organization. They are often responsible for profit and loss on their projects.

Project managers use Solomon on smaller projects not managed in Microsoft Project to:

- Create new projects
- Create new tasks
- Assign resources to tasks

Project managers use Business Portal to:

- Monitor project risks and issues
- View progress
- Approve project costs
- Review schedules
- Manage documents

Project managers use Microsoft Office Project Professional 2003 to:

- Create and publish project plans to Project Server
- Modify project plans based on feedback
- Assign team members to project tasks
- Track progress by incorporating task updates from team members
- Determine target and actual project timelines and costs
- Generate reports

Resource Managers

Resource managers are responsible for managing resources and according to their skills and capabilities. They work with project managers and other resource managers in their organizations to ensure they have qualified and available resources to complete the projects.

Resource managers use Solomon on projects not managed in Microsoft Project to:

- Track resources' skills and location
- Maintain resource rates
- View resource assignments

Resource managers use Business Portal to:

- Approve resources' time and expense reports
- View workload and availability by project over time
- View workload and availability by resource over time
- Post issues and upload documents

Resources

A team member is the most common type of resource. Team members typically work on one or more projects at any given time and are responsible for completing tasks according to a schedule. They can use both Business Portal and Microsoft Office Outlook® 2003. Outlook functionality is provided using a Microsoft Project add-in component that is downloadable from Project Server.

Resources use Business Portal to:

- View task assignments on all projects

- Meet deadlines by identifying current and upcoming tasks to prioritize daily work
- Report time spent working on tasks by entering hours in timecards
- Report expenses
- Record and respond to project-related issues and risks
- Link issues to tasks
- Submit status reports
- Work collaboratively with other team members on project-related documents

Resources use Outlook to:

- Receive e-mail notification of new tasks, issues, and assignments

Viewers

A viewer is a user who uses Business Portal to view status or reporting on a project or multiple projects. For example, an executive can oversee several projects that are managed by different project managers to gain an overall perspective on schedule and budget.

Viewers use Business Portal to:

- See financial reports based on Solomon data
- Send issues to project and resource managers

Administrator

Administrators implement and manage Solomon, Microsoft Project, Project Server, and Microsoft SQL Server™ 2000. These users manage access to the server and the server databases. Business Portal provides access to the Project Server administrative tools. These users also use tools provided with Microsoft Windows Server™ and SQL Server.

Administrators use Solomon to:

- Define account categories
- Setup the Solomon-Microsoft Project Server integration
- Add and remove team members from the Resource Pool

Administrators use Project Professional to:

- Define project and resource reporting codes
- Upload templates

Administrators use Business Portal to:

- Define timecard and expense report layouts
- Create standardized reports for Portfolio Analyzer views (requires Microsoft Office 2003)

Project Variables

After understanding the types of users who manage, complete, track, and resource projects, it is important to characterize the types of projects that your organization works on. The following project-related variables have a significant impact on how Project Server is used:

Number The number of projects that your organization is working on at any given time.

Size The number of tasks and assignments that are contained in a project.

Duration The amount of time that it takes to complete a project.

Resource assignments The number of team members who are assigned tasks in a given project.

Most organizations manage projects that vary in size and duration, but the degree to which they vary can be a function of the size of the organization and the type of work that it performs. For example, a large consulting company might manage several thousand projects ranging in size from small, 10-task projects lasting two weeks up to a large project of 1,500 tasks taking over a year to finish.

While an organization may work mostly on one type of project of a particular size, such as small and simple projects or large and complex projects, that organization will typically have a number of projects that range in size from small to medium to large. The planning in these cases should focus on supporting the type of project that is most common in the organization.

Timesheets and Time and Expense Tracking

Most organizations use Business Portal with Solomon to enable users to track time and expenses spent on projects. Time accounting typically occurs on Friday of any given week but varies according to the organization's need or practice.

Whenever time recording is due, it is typically due for *all* users at the same time. Depending on the number of users recording their time and the number of different time zones, this can place a heavy load on the computer(s) running Internet Information Services (IIS).

Collaboration

In a collaboration scenario, Project Server is used primarily to communicate project status for a number of project teams. Project Professional is used to publish and update project plans and assignments. Business Portal is used to access tasks and assignments, submit time and expense information, and access documents, issues, and risks.

Portfolios

Portfolio management is used to track a collection of related projects. Project Professional is used daily to publish or update project plans. Business Portal is used to view assignments, report actuals, and access documents, issues, and risks. Additionally, online analytical processing (OLAP) cubes are generated weekly.

Project Server Features Used

Several Solomon and Project Server features are installed by default, but others are chosen because of organizational needs. Depending on usage, each feature, or component, generates some type of load on the system. Knowing the components your organization requires, and the hardware impact of those components, is key to planning a successful configuration.

Portfolio Analyzer/OLAP

Portfolio Analyzer is used to interpret data built in an OLAP cube. When the cube is built, it reads heavily from the Project Server tables (MSP) and writes to the Project View tables (MSP_VIEW). This activity is intense but short-lived. Portfolio Analyzer itself causes a brief but heavy processing load on the server where it is installed. The majority of the performance load, however, is absorbed on the client computer.

Note: At least one project must be published in order to use OLAP and Portfolio Analyzer. Published projects provide the data from which the cube is built and analyzed.

Portfolio Modeler

Portfolio Modeler enables a resource manager to gauge resource availability for projects across the organization. When invoked, Portfolio Modeler causes a brief but heavy processing load on the computer running Project Server.

Microsoft Windows SharePoint Services

Microsoft Windows® SharePoint™ Services is a Web-based application that enables document management as well as risk and issue tracking capabilities for Project Server. This application ships as part of Windows Server 2003.

Enterprise Global Template

The Enterprise Global Template allows users to define and reuse elements such as views, field definitions, and macros. When Project Professional is started, the Enterprise Global Template that is stored in the Project Server database is loaded. The Enterprise Global Template contains additional enterprise-only information that is applied over the local Global Template. Administrators can define the value lists and lookup tables for these fields and can define whether the fields are required. This process ensures that all enterprise projects use a consistent set of fields to generate cross-enterprise reports.

Enterprise Resources

Project Server uses a pool of resources to enable multiple project managers to share a common set of resources, thus allowing project managers to view how a resource is used across multiple projects and to gain an accurate picture of the resource's workload and availability. Project Professional can access resources from the enterprise resources stored in the Project Server database. Project Professional adds only the required enterprise resources to a project and only one summary record for each shared project using the resources added to a project, unlike the use of a local resource pool file. This allows Project Professional to support large numbers of enterprise resources (more than 1,000) while improving performance when project managers access and add resources from the group of enterprise resources to a project.

Understanding Environmental Factors

You may need to account for certain environmental variables that affect the configuration decisions you make. How users access Microsoft® Project Management and Accounting applications and components is an important factor in configuration planning. This section discusses several of these environmental variables including extranets and trusted versus non-trusted domain scenarios.

Latency vs. Bandwidth

It is important to understand the difference between latency and bandwidth and the impact each has on Project Server performance.

Latency

Latency refers the actual *speed* of a connection by measuring the delay that occurs as packets are transmitted from one network to another or from one part of a network to another. This delay is measured in milliseconds (ms) and is typically introduced by gateway devices such as routers and bridges, which process packets and perform protocol conversion. A network with high latency can experience unacceptable performance.

Bandwidth

Bandwidth refers to the *capacity* of a connection by measuring its maximum throughput. The greater the bandwidth, the more data can be transferred in a given time. High bandwidth connections are important in a project management solution. However, a bandwidth connection that also experiences high latency will likely not meet performance expectations.

Wide Area Networks

With few exceptions, most organizations use some type of WAN. While bandwidth can be an important consideration in a WAN environment, the major concern for a Project Server deployment is latency. For a WAN connection, lower latency translates into greater WAN performance. For most organizations, an acceptable WAN performance means that latency should not exceed 30 ms. Latency becomes an issue when moving large amounts of data over the WAN connection, such as when a Project Professional user opens a project.

In addition to low latency, the bandwidth for a WAN connection should be at least 10 megabits per second (Mbps) and preferably 100 Mbps or higher.

Regardless of bandwidth, WAN connections with latency above 30 ms may necessitate using Windows Terminal Services.

Using Windows Terminal Services

Using Terminal Services is an effective way of overcoming a high-latency WAN link connection. Terminal Services is a Windows component that uses terminal emulation software to send keystrokes and mouse movements from the Microsoft Windows® client to a copy of Project Professional installed on a computer running Terminal Services. Interaction with the Project Server database is handled between the computer running Terminal Services and Project Server.

Any user with permission to access both the server running Terminal Services and Project Server will be able to use the copy of Project Professional and Business Portal on the server running Terminal Services. A profile can be set up for each user of Project Professional.

Extranet

Deploying a Project Management and Accounting solution requires thoughtful planning to ensure that both internal users and necessary external users have access to project-related information and data. While Microsoft Project supports multiple types of extranet deployments, Solomon and Business Portal will only work within a company's intranet, or through a Virtual Private Network (VPN) connection. For more information about extranet configurations for Microsoft Project, see the Microsoft Office Project Server 2003 Configuration Planning Guide: <http://go.microsoft.com/fwlink/?LinkID=20235>

Understanding Project Architecture

A Project Management and Accounting solution that is based on Solomon and Microsoft® Office Project Server 2003 is deployed across three tiers: client, application, and database. Applications and components in each tier provide availability and scalability for organizations of any size to manage their projects.

Project Management and Accounting logical view



Logical view of Project Management and Accounting solution

Client Tier

This section discusses the various client-side options in a Project Management and Accounting solution. These options include applications based on Microsoft Office, a Web-based option, and organization-specific custom applications.

Microsoft Business Solutions-Solomon

Microsoft Business Solutions-Solomon is a robust, flexible solution built to meet the needs of project-centric and distribution-driven companies. Its customization and integration tools help organizations adapt best practices, integrate with other systems, serve customers better, and excel in their respective industries. It also boosts employee efficiency by providing real-time data access through the Web-based interface that is provided in Business Portal.

Project Professional

Microsoft Office Project Professional 2003 is the next-generation desktop application designed specifically for project managers to create, publish, and manage project plans. In addition to core scheduling and tracking tools, Project Professional provides project managers with enterprise resource and portfolio management capabilities.

Outlook

Project Management and Accounting notifications flow to Microsoft Outlook (or any SMTP mail server) to keep users up to date. For example, a user can be notified of a new task assignment, time or expense reports that need approval, projects that are behind schedule/budget, or a new document having been checked in to Windows SharePoint Services.

Office Web Controls

For users that will be running Portfolio Analyzer views, Project Server requires that they have Office 2003 Web Controls installed on their client computers. This can be accomplished in one of two ways:

- Installing one or more Microsoft Office 2003 applications, such as Outlook
- Downloading the Office Web Controls the first time a user accesses Project Web Access

Application Tier

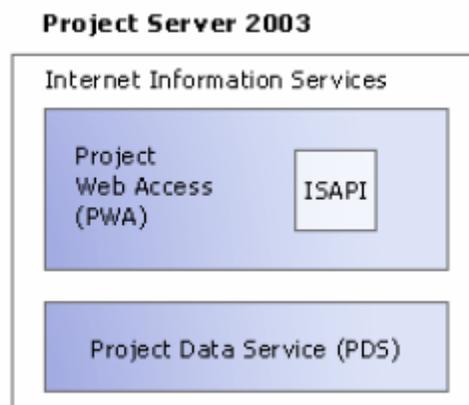
This section discusses the application tier in a Project Management and Accounting solution. This tier is made up of Web-based front-end applications integrated with Internet Information Services (IIS), Project Server components, services based on Project Server, and an optional e-mail server.

Web Front End

This section discusses the three applications that are accessed by users. Each is dependent on Internet Information Services.

Project Server

Project Server 2003 is one central component of a Project Management and Accounting solution. Project Server is a robust and highly scalable Web-based server application that integrates with several client-side applications, the Microsoft Windows Server™ platform, and Microsoft SQL Server™ 2000.



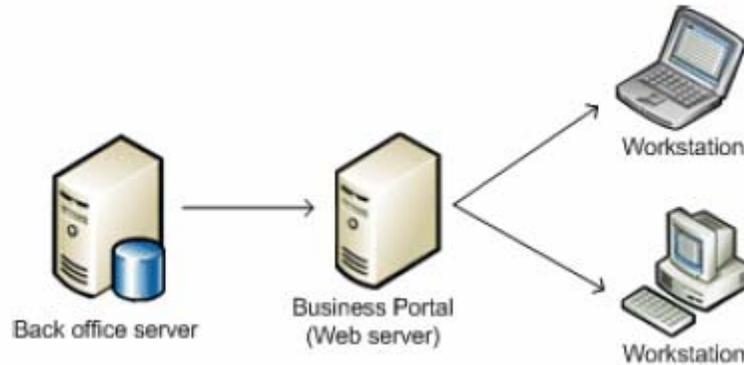
Project Server logical diagram

Project Server can be installed on a single computer or in a load-balanced cluster to provide additional availability and scalability. Project Server 2003 is supported on a computer running Windows 2000 Server or later.

Business Portal

Basic Configuration

At least two servers are required for the basic configuration for Business Portal: an existing back-office server (i.e., the server on which the Solomon application is installed) and a Web server. A Terminal Services server or another Web server can also be added to the configuration.

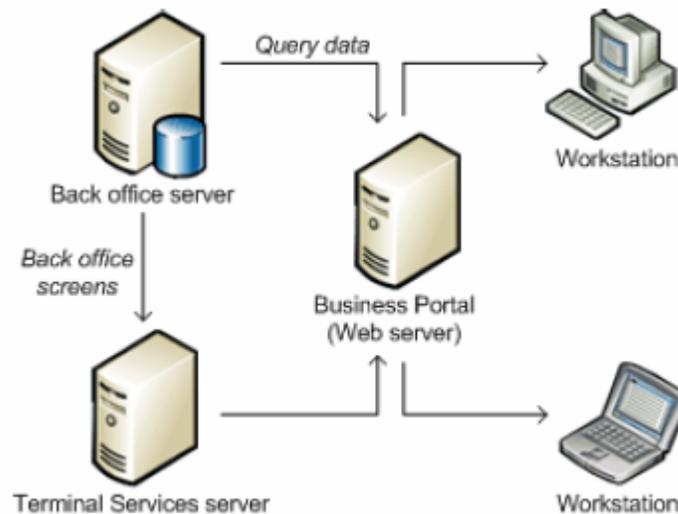


A basic Business Portal configuration

Terminal Services Configuration

With Terminal Services, a component of the Windows operating system, users can access the back-office software over the Web. This is commonly called "thin client" access.

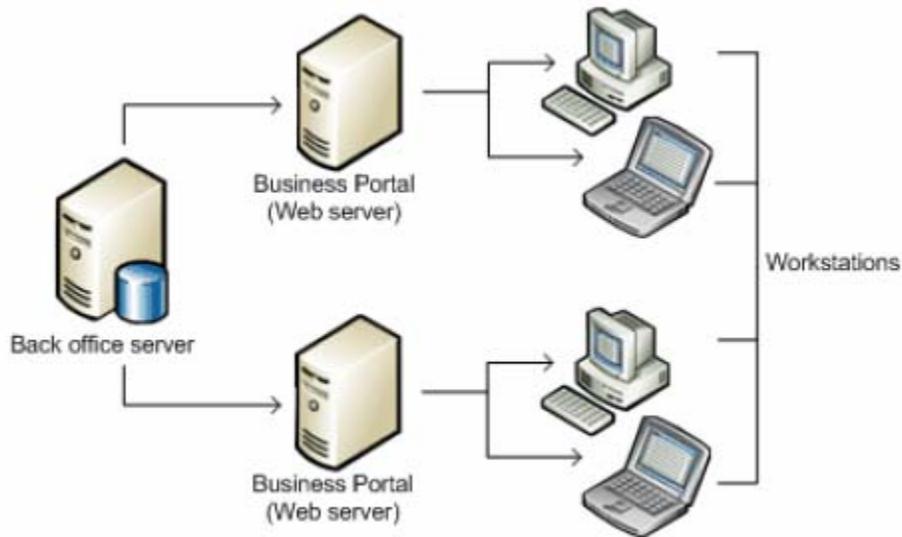
The thin client connects to the Terminal Services server and displays the back-office user interface. All operating system functions — as well the actual back-office application — run on the Terminal Services server. Business Portal queries of back-office data are not processed through the Terminal Services server. Only one Terminal Services server is permitted in a Business Portal configuration.



A Business Portal configuration with Terminal Server

Multiple Web Servers Configuration

In some environments, additional Web servers may be added to the configuration to improve performance.



A Business Portal configuration with multiple web servers

Back-office server requirements

The back-office server must meet the following requirements.

Item	Requirement
Supported operating Systems	Refer to the back-office server requirements in the Solomon Configuration Guide.
Installed applications	Microsoft SQL Server™ 2000 with Service Pack 3 or later† Solomon 6.0 Microsoft Data Access Components (MDAC) 2.71

†The SQL Server compatibility level must be set to 80. In addition, the SQL Server must use mixed-mode authentication.

Web server requirements

The Web server where Business Portal is installed must meet the following requirements.

Item	Requirement
Supported operating systems	Windows Server 2003 (Standard Edition, Web Edition, or Enterprise Edition) with the latest service pack
Processor*	Minimum Dual processor, 1.2 GHz Recommended Dual processor, best available
RAM*	Minimum 512 MB Recommended 1 GB
Disk space	Minimum 500 MB Recommended 1 GB
File system	NTFS
Installed applications	Microsoft Internet Explorer 6.0 with Service Pack 1 or later** Microsoft Internet Information Services (IIS) 5.0 with Service Pack 1 or later Microsoft .NET Framework 1.1† Microsoft Data Access Components (MDAC)† Windows SharePoint Services†† Optional: The Solomon client and Solomon Application Server module must be installed and running to use Report Scheduler
Additional installed applications if using Terminal Services	Terminal Services Client (part of the Windows Server 2003 Administration Tools Pack) For more information, go to www.microsoft.com/downloads/ and choose Server Applications > Windows Server 2003 Administration Tools Pack.
Other installed applications	Optional: Adobe Acrobat Reader 4.0 or later (required to read the installation guide, user's guide, or administrator's guide, and to view reports published in Acrobat PDF format.)
<p>*If you use antivirus software, consider its requirements when you calculate requirements for your business.</p> <p>**Browser settings on the server must be set appropriately. Refer to "Setting browser settings for a workstation" in the Business Portal Administrator's Guide for more information.</p> <p>†Included in the Windows Server 2003 operating system.</p> <p>††You must install the re-released version of WSS. The re-released version includes a software update that resolves a DLL signature verification problem. For more information, refer to Microsoft Knowledge Base article #833019.</p>	

Terminal Services server requirements

Refer to CustomerSource (<http://mbs.microsoft.com/customersource>) to get the latest requirements for using Terminal Services with Solomon. When using a Terminal Services server with Business Portal, you should be aware of these additional requirements and limitations.

- o A Terminal Services server can support 10 to 15 concurrent users per processor.
- o A Terminal Services server requires 10 to 15 MB RAM per user.
- o To use Terminal Services load balancing, the Terminal Services servers must use a single IP address.

Client workstation requirements

Client workstations must meet the following requirements.

Item	Requirement
Supported operating systems	Recommended Windows XP Professional Also supported Windows 2000 Professional, Windows 2000 Server, Windows Server 2003
Processor	Minimum 700 MHz Recommended 1.2 GHz or higher
RAM	Minimum 256 MB Recommended 512 MB
Browser	Microsoft Internet Explorer 6.0 with Service Pack 1 or later† Cumulative patches for Internet Explorer
Microsoft Office	Minimum Microsoft Office 2000 Recommended Microsoft Office XP or later
Other installed applications	Optional: Adobe Acrobat Reader 4.0 or later (required for reading or printing Business Portal manuals or reports published in Adobe PDF format)
†Browser settings on employee workstations must be set appropriately.	

Connecting to Business Portal

Business Portal supports only intranet scenarios. This means that all Business Portal users are expected to connect through an intranet, a virtual private network (VPN), or a dedicated line.

All Business Portal users also must have valid NTLM (Windows® NT LAN Manager) credentials; Business Portal does not support anonymous users.

Network environment requirements

To get the best possible performance from Business Portal, the network should meet the following requirements.

Connection	Minimum	Recommended
Server-to-server	100 Mbps Ethernet	100 Mbps Ethernet
Server-to-client	10 Mbps Ethernet	100 Mbps Ethernet
Remote users	56 kbps (dial-up)	Broadband: cable or DSL

Protocol

TCP/IP must be running on your network. For more information about TCP/IP, see your networking-protocol software documentation.

IP addresses

Each computer that you use must have a unique Internet Protocol (IP) address associated with it. For more information about IP addresses, see your networking-protocol software documentation.

TCP/IP name resolution

You should use some type of name resolution in your network, so that each computer is identified by a unique hostname. Name resolution is a method of identifying each computer and can be accomplished by having a specific server act as a domain-name server or by putting a hosts file on each client and server. For more information about name resolution using either a domain-name server or hosts files, see your networking-protocol software documentation.

Domain

A domain is required for installation and use of Business Portal. A domain is a group of computers that are part of a network and share a common directory database. A domain is administered as a unit with common rules and procedures. Each domain has a unique name.

For information about setting up and administering a domain, refer to your Windows documentation.

Firewall

A firewall protects computers on your network from those outside of your network. It checks the authorizations of computers passing data back and forth through it. The firewall reviews each data packet to determine who it is from, where it is going, and what it is attempting to do, and then determines what should be done with the packet.

If users will be accessing Business Portal via the Internet, we strongly recommend that you set up a firewall to help protect your accounting and financial management information. For more information about setting up a firewall, refer to the Microsoft security Web site (<http://www.microsoft.com/security>).

Proxy server

A proxy server consolidates traffic that is flowing through the firewall. The proxy server caches some Internet content on a server inside your firewall (on your local network) and delivers that content to your desktop when you request it. This makes browsing faster and reduces network traffic. The proxy server also performs many of the same functions as a firewall in determining who should have access to certain pieces of information.

If users will be accessing Business Portal via the Internet, we strongly recommend that you set up a proxy server to help protect your accounting and financial management information. For more information about setting up a proxy server, refer to the Microsoft security Web site (<http://www.microsoft.com/security>).

Perimeter network

For any environment where users access Business Portal over an Internet or extranet connection, it's strongly recommended that you set up a perimeter network (also known as DMZ, demilitarized zone, or screened subnet), which could require four or more additional servers:

- o Two firewall servers
- o Perimeter network IIS Server (Business Portal server)
- o Perimeter network domain controller

You should seek the advice of an experienced Internet and intranet consultant to set up a perimeter network.

Microsoft Windows SharePoint Services

Microsoft® Windows® SharePoint™ Services is a component of Windows Server 2003 that integrates with Project Server to provide document management and risk and issue tracking. Windows SharePoint Services is available as a free download from Microsoft.com and is only supported on a computer running Windows Server 2003, IIS 6.0, and ASP.NET. Windows SharePoint Services is also used by Microsoft Business Portal.

Note: SharePoint Team Services from Microsoft, which shipped as part of Project Server 2002, is not supported for use with Project Server 2003.

Like Project Server, Windows SharePoint Services is a Web-based application that is integrated with IIS. Windows SharePoint Services can be installed with Project Server on a single server or a load-balanced cluster, or it can be installed on a separate server or load-balanced cluster. Users can access the Windows SharePoint Services features of Project Server using Business Portal, although a Windows SharePoint Services site can be used stand-alone.

Project Data Service

The Project Data Service (PDS) is essentially the Project Server application programming interface (API). PDS is a Web service hosted within Internet Information Services. PDS ensures that Project Server data stored in the database remains consistent, to a point. PDS authenticates the user and provides access only to the Project Server data that the particular user is authorized to view. Any project plans that are currently open by other project managers will only be available as read-only. This prevents simultaneous changes to a project plan. Developers can call PDS methods through its Simple Object Access Protocol (SOAP) interface.

Services

This section discusses the Project Server-based services within a Project Management and Accounting solution that can be installed as part of a distributed deployment.

View Processing

View Processing is responsible for updating the View tables in Microsoft SQL Server each time a project or resource is added or modified. It relies on the View Processing service, which processes requests to publish project plans and build the SQL Server Analysis Services cube. By default, this service runs at below-normal process and thread priority, which limits the system resources it uses. When Project Server is installed in a load-balanced cluster, the Views Processing service must be offloaded to a separate server. This allows the View Processing service to run at a normal-thread priority on that server. Even if Project Server is not deployed to a load-balanced cluster, an organization should consider offloading the View Processing service if the average number of tasks per project reaches 800-1000.

Note: The View Processing service will only use the resources from a single CPU, even if it is installed on a computer with multiple CPUs. You may still want to use a multiple-CPU computer to allow the service to use the maximum resources of one CPU while allowing other processes to access another CPU.

When a project manager publishes a project plan, the entire project plan is physically published to the Project tables and is available for other project managers. The views of those projects work differently. The View Processing service reads the project data from the transactional tables in the Project database and then writes the project data in its fully expanded (time-phased) state to the view tables. The View Processing service queues publish requests in serial and writes views for only one project at a time. Depending on the sizes of the projects, project views may not be available to Business Portal users for a short time.

Session Manager

The Session Manager relies on the Session Manager Service to maintain session-state information for Business Portal users. Each user is issued a session ID when he or she logs on to a computer running Project Server using Business Portal. This ID is used to save and retrieve session-specific information, such as which Business Portal panes are displayed in Internet Explorer or recently viewed pages. Session Manager uses the Remote Procedure Call (RPC) protocol to communicate with IIS. When Project Server is installed in a load-balanced cluster, the Session Manager Service can be offloaded to a separate computer. This can be on the same computer where the View Processing service is installed or on a computer that is separate from both the Project Server cluster and the computer running the View Processing service.

Note: When Project Server is installed in a load-balanced cluster, the Session Manager Service can be installed on each computer running Project Server. This is called session affinity, or sticky sessions. In this configuration, the Session Manager Service on each Project Server in the cluster maintains session-state information only for that server.

E-mail

This section discusses the role of an e-mail server in a Project Management and Accounting solution.

SMTP Mail Server

An e-mail server, such as Microsoft Exchange Server 2003, is used to send task and assignment notification and reminder e-mail messages to the appropriate users. These e-mail messages can be sent using any Simple Mail Transport Protocol (SMTP) or Post Office Protocol (POP)-compatible e-mail server. Exchange Server offers the most robust integration with Microsoft Outlook, a Windows-based e-mail client, and includes Outlook Web Access, which enables users to access their Exchange mailbox using Internet Explorer.

Database Tier

This section discusses the database tier in a Project Management and Accounting solution. The database tier uses Microsoft SQL Server to manage and store project-related data. This data consists of several sets of database tables, each with its own uses. These tables can be combined on a single computer running SQL Server 2000 or the Microsoft Project tables can be partitioned across up to three servers. Organizations that require a centralized storage system can employ a storage area network (SAN).

Solomon Database

Solomon uses a minimum of two SQL Server databases per installation. The Solomon System database holds site-specific information that is used for managing the overall installation of Solomon. One or more Application databases contain the business-specific information.

The Solomon System Database holds and maintains information that is specific to the site in which Solomon is installed. This includes users, groups, access privileges, product registration, customizations, event logs, system messages, and scheduled requests. System utilities are provided within the Solomon System Manager module, which references this information to manage the particular Solomon applications that are installed at the site.

An Application Database contains data for one or more companies. Solomon's multi-company feature is designed to allow data for multiple companies to reside in a single or separate Application Databases, depending on the requirements of the customer installation.

Project Database

The Microsoft Project database is a set of SQL Server tables accessed by project managers using Microsoft Project Professional. When a project manager creates or updates a project plan, all project data is stored in this set of tables, including all versions of each project. This database contains the MSP_* tables.

Views Database

The Views database is a set of Microsoft SQL Server tables representing a rationalized view of the project data contained in the Microsoft Project database. When a project manager publishes or updates a project plan, the Project OLE DB Provider on the computer running Project Server extracts the project and resource data and publishes it to the View tables.

These read-only tables are used to generate a number of different views and reports across multiple projects. This database contains the MSP_VIEW_* tables.

Project Server Database

The Project Server, or Web, database contains several sets of SQL Server database tables that are primarily accessed using Business Portal. This database contains the MSP_WEB_*, MSP_VERSIONS, and MSP_CUBE_* tables, as well as views of tables in both the Project Server and Views databases.

Database Partitioning

New to Project Server 2003 is the ability to partition the Project-related SQL Server database tables. Partitioning enables you to place the Project-related sets of database tables on separate computers running SQL Server, thereby isolating data access by user type. For example, the Project Server tables can be accessed by project managers on one computer running SQL Server, while the Business Portal tables and View tables can be accessed from a separate computer running SQL Server. This improves client response time and provides greater scalability.

Analysis Services

SQL Server 2000 Analysis Services is a set of tools provided to assist you in developing and managing data used in online analytical processing (OLAP). Analysis Services consists of the Analysis Service server and other supporting components. The Analysis Service server constructs cubes of data to assist in multidimensional analysis. The term *cube* is used to describe aggregate data. This aggregate, or summary, data is used for complex analytical queries such as monthly sales results and sales projections. In multidimensional analysis, multiple queries look at a database from different points of view, or dimensions.

The primary form of data representation within Analysis Services is the OLAP cube. A cube is a multidimensional representation of both detail and summary data. Detail data is specific row data, whereas summary data is aggregate data. Cubes are designed based on the analytical requirements set by the data itself. Each cube represents a different business entity, such as sales or inventory. Each side of the cube presents a different dimensional picture of the data.

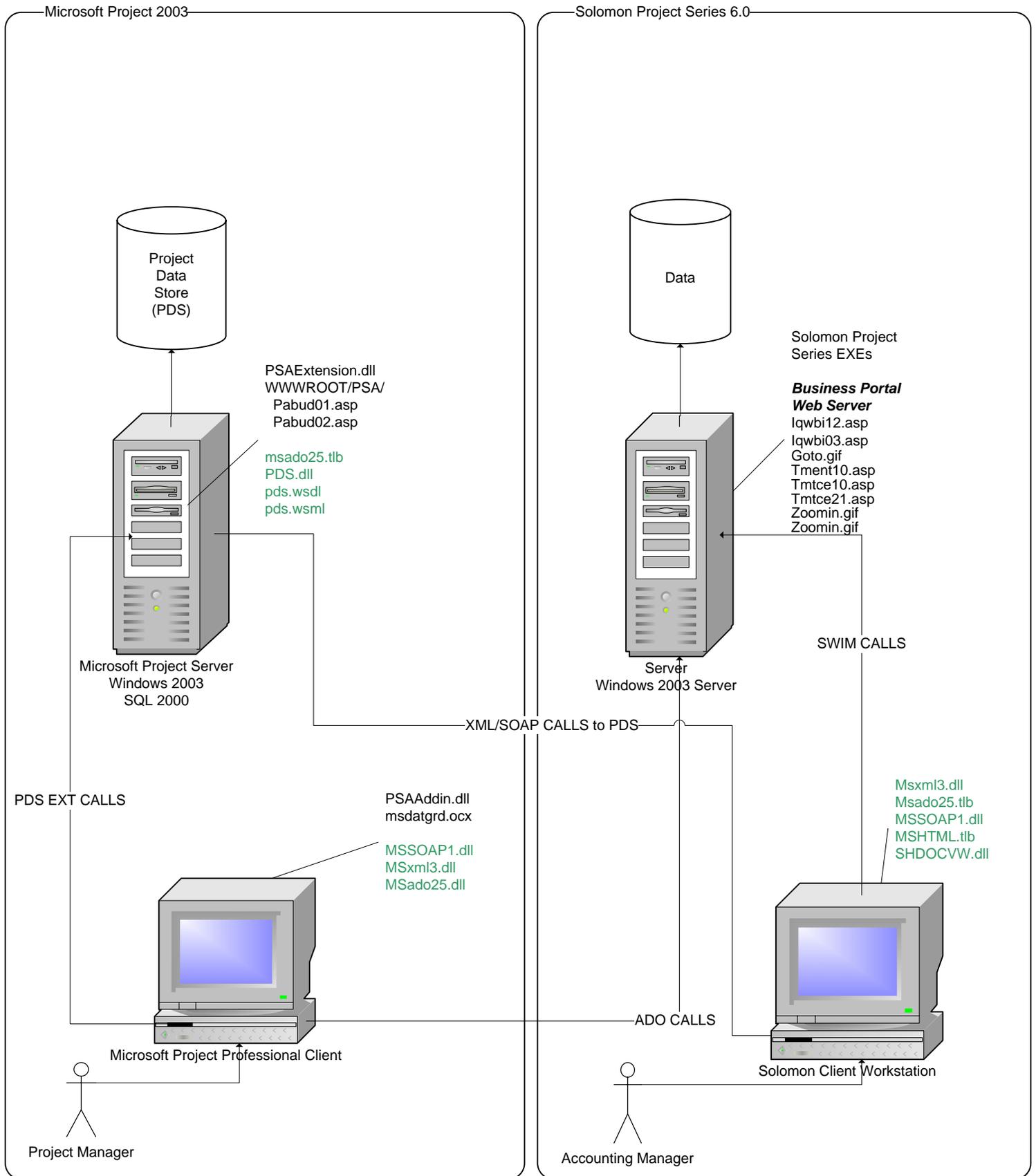
Analysis Services is required if you use the Portfolio Analyzer feature in Project Server. Portfolio Analyzer enables users to view project and resource information conveniently, in a variety of ways, such as a PivotTable. To deliver this functionality, Project Server uses Microsoft Office Web Controls, which are a collection of ActiveX controls designed to let users publish fully interactive worksheets, charts, PivotTable reports, and databases to the Web.

Analysis Services can be installed on a computer running SQL Server (and on a computer running both SQL Server and Project Server), but you will realize significant performance gains by installing it on a separate computer. If Analysis Services is installed on its own server, or apart from Project Server, the Analysis Service decision support objects (DSO) must be installed on the computer(s) running Project Server.

Using a Storage Area Network

Project-related database tables can be stored on a single SQL Server or partitioned on separate SQL Servers. Alternatively, a SAN is seamlessly integrated into the database tier for those organizations that desire a centrally located data store.

Solomon Project Management and Accounting Deployment Architecture



Solomon Project Management and Accounting Deployment Architecture Diagram

The Microsoft Office Project Professional user, pictured on the left and labeled "Project Manager," updates project and task information (new or modified tasks) and resource assignment information directly into the Solomon database through the PSAADDIN DLL, using ADO. In addition, this same technology is used to display the "Profit Pane," which is an HTML-rendered screen that appears within Project Professional (as a split screen) showing project actuals and budgets at the accounting level.

The Solomon Project Management and Accounting user, pictured on the right and labeled "Accounting Manager," updates project and task information (new or modified), resource information (new or modified), and project actuals, into Microsoft Office Project via XML/SOAP calls to the Project Data Service (PDS) XML API. For the most part, this is accomplished with the use of specially written PDS extensions and methods.

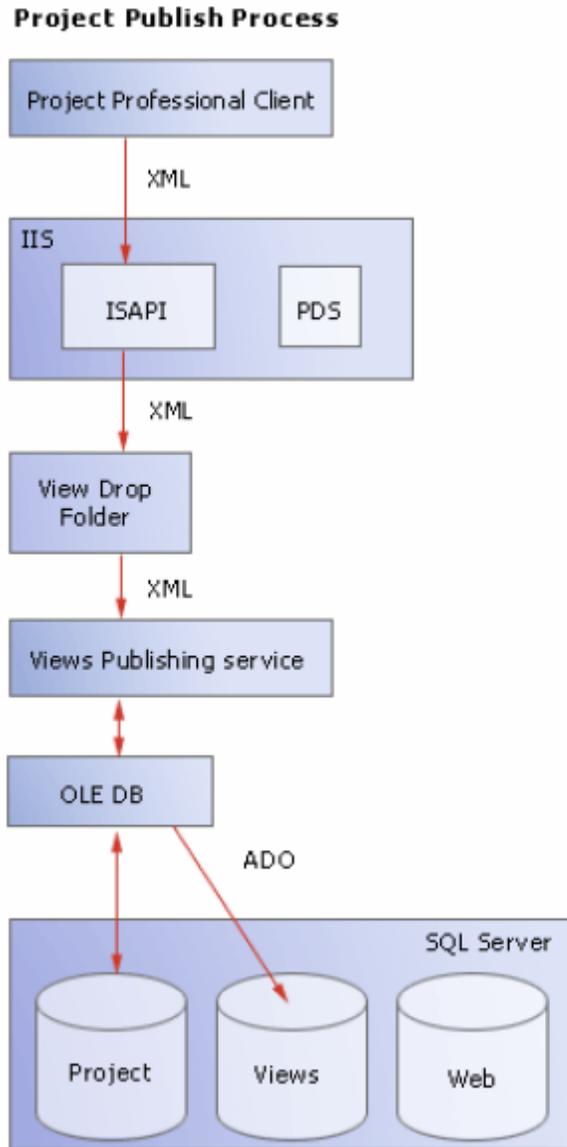
The primary data elements in Project Management and Accounting that integrate with Microsoft Project are projects, tasks, account categories, and employees (resources). The Solomon screens that maintain these records contain a field for designating the specific project, task, account category, or employee as being integrated with Microsoft Project. The following describes the relationships between these Solomon data elements and those used within Microsoft Project.

Synchronizing resource assignments and calculated work and cost figures is accomplished by clicking the Synchronize Project with Solomon button on the Solomon Integration toolbar. However, it is not possible to integrate pre-existing projects in Microsoft Project with pre-existing projects in Solomon. Synchronizing data in Microsoft Project updates Solomon with new Project Master and Task Master data. It also synchronizes information for integrated resources assigned to integrated projects and tasks for updating the Task Employee and Project Employee tables. This function is often used when the project plan has been updated and the user wishes to synchronize data with Solomon immediately.

Project Publish

When a project manager publishes a project plan, Project Professional sends a publish request to the computer running Project Server. The Internet Server Application Programming Interface (ISAPI) DLL writes the information to the ViewDrop folder in XML format. The ViewDrop folder is used to queue requests to publish project plans. The View Processing service picks up new Publish requests from the ViewDrop folder. When a new publish request is written to the ViewDrop folder, the View Processing service communicates with the Project Server OLE DB provider. The Project Server OLE DB provider reads the project data from the transactional tables in the Microsoft Project database and then writes the project data in its fully expanded (time-phased) state to the view tables in the Microsoft Project database using the Active Data Objects (ADO) protocol.

Note: When a resource is published, ISAPI writes this information directly to the Web database tables.



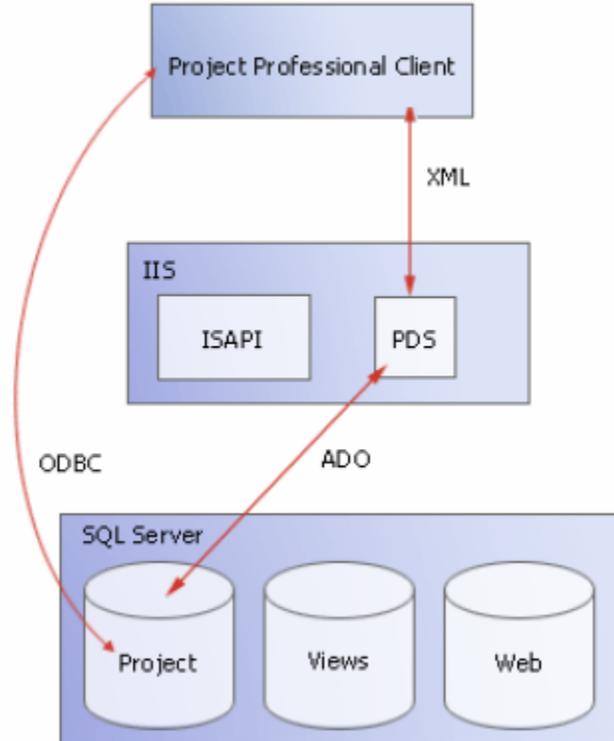
The process of publishing a project plan

Project Open and Save

When project managers choose to open a project plan in Microsoft Project, Project Professional communicates with the Project Data Service (PDS). PDS checks their credentials and if they are allowed access to the project, it makes the project data in the database available to them. PDS then returns the security information needed to access the project data to Project Professional. Project Professional then reads the project data over the network using the Open Database Connectivity (ODBC) protocol.

When a project manager saves the project, the process is the same except that the ODBC communication writes data, rather than reading it. When saving a Project Management and Accounting integrated project, the project manager will be prompted to synchronize with Solomon.

Project Open/Save Process



The process of opening and saving a project plan

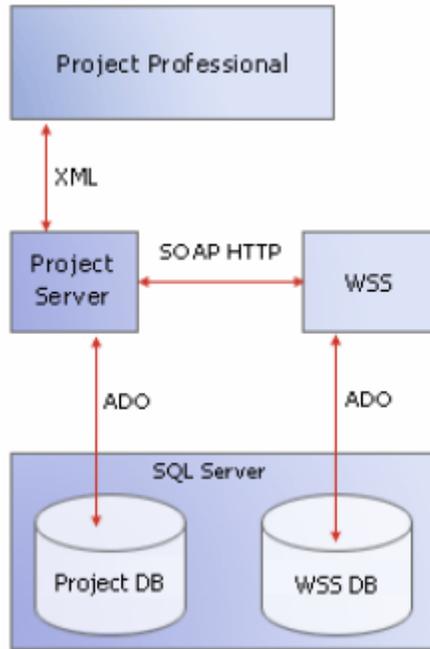
Windows SharePoint Services Processes

This section briefly examines a scenario involving Windows SharePoint Services integration and automatic workspace creation. This scenario will focus on server-side communication during the following operations:

- Project manager publishing a project
- Team member uploading a document

New Site Created During Project Publish

When a project manager publishes a project plan from Microsoft Project, Project Professional sends a publish request to the computer running Project Server. In addition to the operations referenced above in the *Project Publish* section, a SOAP call is made to the Admin port on the computer running Windows SharePoint Services. (The port number is configured during Windows SharePoint Services setup.) The new project workspace is then created in the Windows SharePoint Services database. A SOAP response is then sent back to the Project Server that contains the details on the new workspace. The published project is then updated with this information.



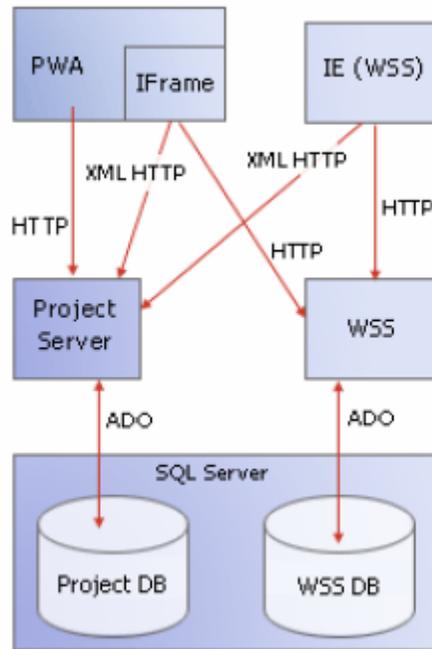
Creating a workspace when a project is published

Knowledge Worker Posts Document to New Site

Once the project has been published and the new workspace created, a team member logs on to Business Portal. All Windows SharePoint Services-related content opens in an IFrame within the Business Portal interface in Internet Explorer.

When the team member uploads a document, the document is added to the Windows SharePoint Services database. Information is then sent to the Project Server to update all the links in the Project database that pertain to the document, including any tasks, issues, or risks that are linked to the document. The document will be available the next time a team member opens that workspace or any tasks, issues or risks linked to the document.

This process works the same way if a team member accesses the site directly from standalone Internet Explorer as it does from within Business Portal.



Knowledge worker posts document to project workspace

Configuration recommendations

Based on a careful examination of all factors explored in this paper, a choice of the following configurations or variations of these configurations will provide adequate application performance while still allowing for flexibility and extensibility as an organization grows.

Minimal configuration

While not recommended, it is possible to load all components of the Project Management and Accounting solution onto a single server. This might be appropriate for a simple pilot, but could cause problems in a production environment. Note that Microsoft Small Business Server is not a supported platform for Project Server, but is a supported platform for Solomon.

Hardware	Applications
Single server, minimum 1GHz processor, 512MB RAM	Internet Explorer Microsoft Business Solutions-Solomon Microsoft Office Project Professional Microsoft Business Solutions Business Portal Microsoft Project Server Microsoft SQL Server SQL Analysis Services Windows SharePoint Services Windows Server 2003 with IIS

Standard Configuration

This is the minimum recommended system to run the Project Management and Accounting solution for a small or small-medium business.

Hardware	Applications
Client machines: minimum 500MHz processor, 256MB RAM	Microsoft Internet Explorer 6.0 Microsoft Business Solutions-Solomon 6.0 Microsoft Office Project 2003 Professional Windows XP Professional
One Application Server: minimum 1GHz processor, 512MB RAM	Microsoft Business Solutions Business Portal Microsoft Project Server 2003 Windows SharePoint Services Windows Server 2003 Standard Edition with IIS
One Database server: minimum 1GHz processor, 512MB RAM	Microsoft SQL Server Standard Edition SQL Analysis Services Windows Server 2003 Standard Edition

Extended Configuration A

For organizations with significant collaboration needs

Hardware	Applications
Client machines: minimum 500MHz processor, 256MB RAM	Internet Explorer Microsoft Business Solutions-Solomon Microsoft Office Project Professional Windows XP Professional
One Application Server: minimum 1GHz processor, 512MB RAM	Microsoft Business Solutions Business Portal Microsoft Project Server Windows Server 2003
One or more Application Servers in a load-balanced configuration: minimum 1GHz processor, 512MB RAM	Windows SharePoint Services Windows Server 2003 with IIS
One Database server: minimum 1GHz processor, 512MB RAM	Microsoft SQL Server SQL Analysis Services Windows Server 2003

Extended Configuration B

For organizations with balanced accounting, project management and collaboration needs

Hardware	Applications
Client machines: minimum 500MHz processor, 256MB RAM	Internet Explorer Microsoft Business Solutions-Solomon Microsoft Office Project Professional Windows XP Professional
One Application Server: minimum 1GHz processor, 512MB RAM	Microsoft Business Solutions Business Portal Windows SharePoint Services Windows Server 2003 with IIS
One Application Server: minimum 1GHz processor, 512MB RAM	Microsoft Project Server Windows SharePoint Services Windows Server 2003 with IIS
One Database server: minimum 1GHz	Microsoft SQL Server

Hardware	Applications
processor, 512MB RAM	SQL Analysis Services Windows Server 2003

Extended Configuration C

For organizations with significant collaboration and project management needs (lots of resources entering time simultaneously, multiple viewers, many shared document libraries, for example)

Hardware	Applications
Client machines: minimum 500MHz processor, 256MB RAM	Internet Explorer Microsoft Business Solutions-Solomon Microsoft Office Project Professional Windows XP Professional
Multiple Application Servers in a load balanced configuration: minimum 1GHz processor, 512MB RAM	Microsoft Business Solutions Business Portal Windows Server 2003
Multiple Application Servers in a load balanced configuration: minimum 1GHz processor, 512MB RAM	Microsoft Project Server Windows Server 2003
One or more Application Servers in a load balanced configuration: minimum 1GHz processor, 512MB RAM	Windows SharePoint Services Windows Server 2003 with IIS
One Database server: minimum 1GHz processor, 512MB RAM	Microsoft SQL Server - Solomon Databases only Windows Server 2003
Multiple Database servers in a clustered configuration : minimum 1GHz processor, 512MB RAM	Microsoft SQL Server Microsoft Project Server database Windows SharePoint Server database SQL Analysis Services Windows Server 2003

Appendix - customer profile for Microsoft Project

Customer Profile

This profile is created to show a representative installation of Microsoft Project in a fictitious organization. The numbers below are not meant to portray a target size for this technology; on the contrary, Microsoft Project is in use in many small, medium, and large organizations around the world.

This organization is a medium-sized company or a department within a larger organization. This organization uses Project Server for portfolio management. It uses most Project Server features including timesheets, document libraries, and risk and issue tracking. This organization will also take advantage of the Portfolio Analyzer feature, but will not require modeling. This company manages a fair number of projects, some of which can be complex.

See the profile summary section for project information, number of supported users, and the details and configuration sections for additional information on this customer profile.

Profile Summary

The number of supported users and user types is available in the following table:

Type of user	Number of users
Total users	500
Project managers	50
Resource managers	50
Time and expense users	335
Viewers	400

Some average project information is available in the following table:

Item	Description
Average project size (tasks)	Small: 10, Large: 100
Average project duration	Small: 1 week, Large: 2 months
Average yearly projects	Small: 500, Large: 40
Average assignments	Small: 10, Large: 20
Database size on disk	2.5 GB

Standard Configuration

The standard configuration presents two hardware sets, each on a single computer. All components are installed on this one server. Option A represents baseline hardware, where Option B represents more performant hardware.

Performance Summary

View Processing throughput and SQL Server Analysis Services cube-build time are defined below.

See the following table for a comparative performance summary for each hardware set:

Hardware set	View Processing	Cube build	Team member	Project Manager
Option A	463/hr	3 minutes	292/hr	20/hr
Option B	600/hr	3 minutes	380/hr	30.84/hr

Single server deployment

The following table details the installed components shown in the previous figure.

Hardware	Option A	Option B
Operating system	Windows 2003 Standard	Windows 2003 Enterprise
Processor(s)	2 x 1 GHz	4 x 2.2 GHz
Memory	1 GB	1 GB
HyperThreaded	No	Yes
Installed components	Project Server 2003 Windows SharePoint Services Session Manager View Processing SQL Server 2000 Standard All database tables SQL Analysis Services	Project Server 2003 Windows SharePoint Services Session Manager View Processing SQL Server 2000 Standard All database tables SQL Analysis Services

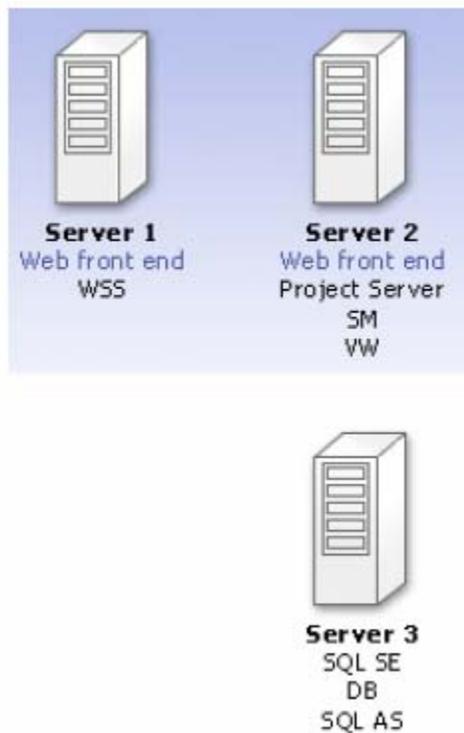
Alternate Configuration

The alternate configuration provides greater performance by installing applications on separate computers. This configuration anticipates higher usage of Microsoft® Windows® SharePoint™ Services and separates SQL Server onto its own computer, which improves database access. View Processing remains on the same computer with Project Server 2003, which means that this organization publishes and updates smaller projects and probably does not build OLAP cubes with any regularity.

Performance Summary

View Processing throughput and SQL Analysis Services cube-build time are defined below. See the following table for a comparative performance summary for each hardware set:

Hardware set	View Processing	Cube build	Team member	Project Manager
Option A	441/hr	3 minutes	175/hr	18.6/hr
Option B	326/hr	4 minutes	174/hr	23.86/hr
Option C	508/hr	2 minutes	167/hr	35.7/hr



Three-server deployment with two front-end servers

The following tables detail the hardware configuration and installed components shown in the previous figure.

Server 1, Profile 1, Alternate Configuration

Hardware	Option A	Option B	Option C
Operating system	Windows 2003 Standard	Windows 2003 Enterprise	Windows 2003 Enterprise
Processor(s)	1 x 1 GHz	1 x 2 GHz	2 x 2.2 GHz
Memory	512 MB	768 MB	1 GB
Network adapter	1 x 100 Mbps	1 x 100 Mbps	1 x 100 Mbps
HyperThreaded	No	No	No
Installed components	Windows SharePoint Services	Windows SharePoint Services	Windows SharePoint Services

Server 2, Profile 1, Alternate Configuration

Hardware	Option A	Option B	Option C
Operating system	Windows 2000	Windows 2000	AS Windows 2000
Processor(s)	1 x 1 GHz	4 x 700 MHz	2 x 2.2 GHz
Memory	256 MB	1 GB	1 GB
Network adapter	1 x 100 Mbps	1 x 100 Mbps	1 x 100 Mbps
HyperThreaded	No	No	No
Installed components	Project Server Session Manager View Processing	Project Server Session Manager View Processing	Project Server Session Manager View Processing

Server 3, Profile 1, Alternate Configuration

Hardware	Option A	Option B	Option C
Operating system	Windows 2000	Windows 2000	Windows 2000 AS
Processor(s)	2 x 2.2 GHz	2 x 2.2 GHz 4	x 700 GHz
Memory	2 GB	2 GB	2 GB
Network adapter	2 x 100 Mbps	2 x 100 Mbps	2 x 100 Mbps
Hard disk	37 GB	37 GB	2 x 34 GB
HyperThreaded	No	No	No
Installed components	SQL Server 2000 Standard All database tables SQL Analysis Services	SQL Server 2000 Standard All database tables SQL Analysis Services	SQL Server 2000 Standard All database tables SQL Analysis Services

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