

Monitoring Server Planning and Architecture Guide for PerformancePoint Server 2007

Microsoft Corporation

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Abstract

This book provides detailed information about Microsoft PerformancePoint Monitoring Server client and server architecture, and it addresses topics essential to planning a PerformancePoint Server deployment in a large enterprise environment. The audience for this book content is for network architects and planners, IT professionals, security specialists, IT operations, deployment staff and consultants.

The content in this book is a copy of selected content in the [Office PerformancePoint Server 2007 technical library](http://go.microsoft.com/fwlink/?LinkId=105040&clid=0x409) (<http://go.microsoft.com/fwlink/?LinkId=105040&clid=0x409>) as of the publication date above. For the most current content, see the technical library on the Web.

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Planning and architecture introduction for Monitoring Server

The audiences for this guide are business application specialists, line-of-business specialists, information architects, IT generalists, program managers, and infrastructure specialists who are planning a solution based on Microsoft Office PerformancePoint Server 2007.

Information includes overviews of the client and server components for Monitoring Server, and also system requirements, available topologies, scalability options, and security considerations.

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See Also

[Planning Server Overview](http://technet.microsoft.com/library/f484979f-bcbb-4346-a629-cbbefcd4fe2c(Office.12).aspx) ([http://technet.microsoft.com/library/f484979f-bcbb-4346-a629-cbbefcd4fe2c\(Office.12\).aspx](http://technet.microsoft.com/library/f484979f-bcbb-4346-a629-cbbefcd4fe2c(Office.12).aspx))

[Monitoring Server Overview](#)

Before you start (Monitoring Server)

Designing a topology should begin at the back end and move towards the front end. Define the number of users. Define the number of applications. Then determine the number of databases and cubes needed. Then build the topology plan from back end to front end.

Monitoring Server

Before you install Monitoring Server and build a dashboard, you should first plan your development process.

Begin by defining performance management goals. Decide if you want to build one dashboard or a set of dashboards. Define the scorecard and any related key performance indicators (KPIs) that you require to build those scorecards, and determine whether those scorecards will share a set of common KPIs. Design any reports that contribute to the information provided in the scorecard or that might help in understanding the KPIs.

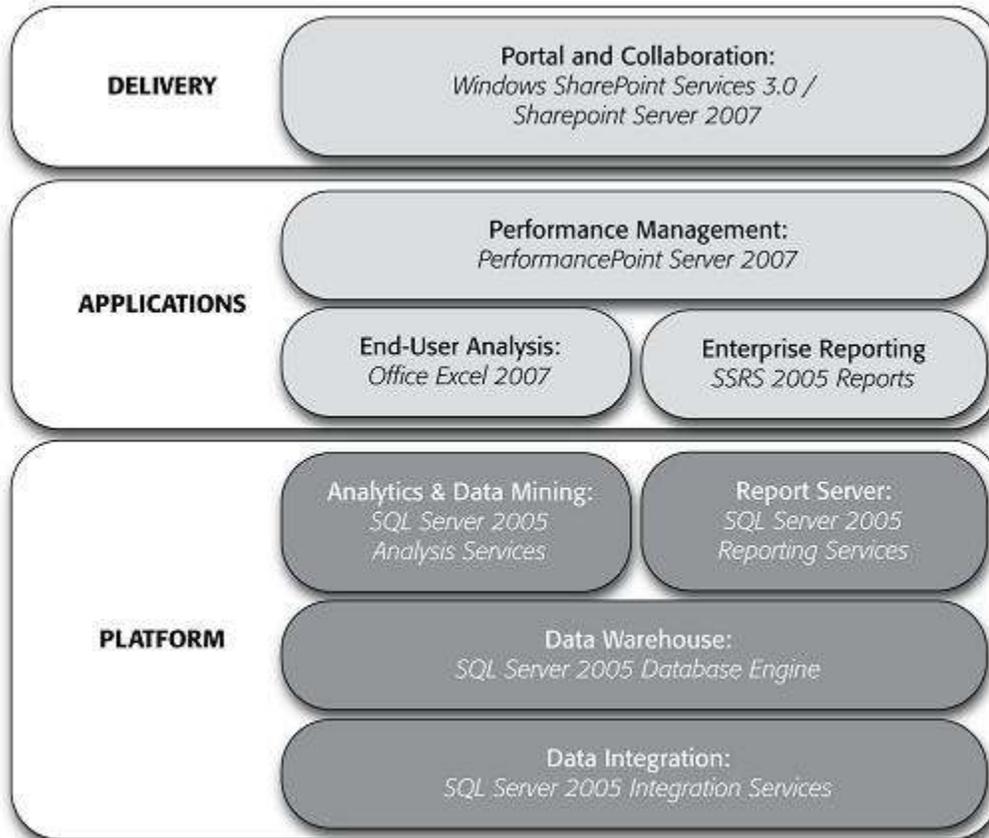
Next steps include:

- **Identify contributors and users** In particular, identify the contributors who will participate in dashboard development.
- **Identify information technology resources** Locate existing databases and documents that can provide business data for KPIs, and determine whether existing SQL Server or Microsoft SharePoint Products and Technologies installations can be used. Determine if you require new databases in order to develop and deploy dashboards.

The business intelligence technology stack

The following diagram illustrates how PerformancePoint Server integrates with other Microsoft products within the business intelligence technology stack.

Current Microsoft BI technology stack



This diagram is an excerpt from [The Rational Guide to Monitoring and Analyzing with Microsoft Office PerformancePoint Server 2007](http://go.microsoft.com/fwlink/?LinkID=120880) (<http://go.microsoft.com/fwlink/?LinkID=120880>), by Nick Barclay and Adrian Downes, and is property of [Mann Publishing Group](http://go.microsoft.com/fwlink/?LinkID=120878) (<http://go.microsoft.com/fwlink/?LinkID=120878>) (978-1-932577-41-9), copyright November 2007, all rights reserved. No part of this diagram may be reproduced, stored in a retrieval system, or transmitted in any form or by any means—electronic, electrostatic, mechanical, photocopying, recording, or otherwise—without the prior written permission of the publisher, except in the case of brief quotations embodied in critical articles or reviews.

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Monitoring Server planning and architecture

Monitoring Server allows business analysts and business decision-makers to measure overall performance, using tools to track the success of key strategic initiatives.

In This Section

[Monitoring Server overview](#)

Introduction to Monitoring Server and how you can use it in your business.

[Introducing PerformancePoint Server Monitoring](#)

A high-level look at the Monitoring architecture and just what pieces are necessary to produce the dashboard solutions that end users really want. (Book excerpt from Rational Press)

[Monitoring Server topology](#)

Discussion of the components of Monitoring Server, with sample topologies

[Monitoring Server components](#)

Details of the components of Monitoring Server

[Monitoring Server system requirements](#)

Details of the system requirements

[Monitoring Server roles and security](#)

How roles and security are used within Monitoring Server

[Monitoring Server - data integration](#)

Integrating data into Monitoring Server from a variety of sources

[Developer and test environments](#)

Implementing Monitoring Server in developer and test situations

Monitoring Server overview

Monitoring Server provides design functionality for the following:

- Dashboard elements
- Read data sources
- Analysis Services
- SharePoint lists
- SQL Server
- Excel 2007
- Excel Service
- ODBC

Monitoring Server also provides publishing functionality by using the following:

- SharePoint Services
- Excel 2007
- PowerPoint 2007
- ASP.NET
- SQL Server Reporting Services (SSRS)

Monitoring Server allows business analysts and business decision makers to:

- Measure overall performance. Every key performance indicator (KPI) represents an organizational goal, such as sales quotas, inventory monitoring, or customer response time.
- Monitor the performance of divisions within in an organization.
- Determine the effectiveness of a specific functional area, such as human resources, legal, or finance.
- Track the success of key strategic initiatives at both the organizational level or departmental level, and determine the root cause of any anomalies.

Using Dashboard Designer, business analysts and IT professionals can create data sources, KPIs, scorecards, analytic reports, and dashboards so that business decision-makers can accomplish these tasks.

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See Also

[Monitoring Server topology](#)

[Monitoring Server components](#)

[Monitoring Server system requirements](#)

[Monitoring Server roles and security](#)

[Monitoring Server - data integration](#)

Introducing PerformancePoint Server Monitoring

Everyone wants dashboards! PPS 2007 Monitoring makes designing, publishing, and managing dashboards simple and the resultant solution very powerful. From this chapter onwards, we will look at all aspects of the Monitor and Analyze (M&A) part of the Monitor, Analyze, Plan paradigm introduced Chapter 1. We will simply refer to it as “Monitoring” throughout the remainder of the book. Don’t worry, though, we will cover both the Monitor and Analyze parts in plenty of detail.

(This article is an excerpt from [The Rational Guide to Monitoring and Analyzing with Microsoft Office PerformancePoint Server 2007](http://go.microsoft.com/fwlink/?LinkID=120880) (<http://go.microsoft.com/fwlink/?LinkID=120880>), by Nick Barclay and Adrian Downes, and is property of [Mann Publishing Group](http://go.microsoft.com/fwlink/?LinkID=120878) (<http://go.microsoft.com/fwlink/?LinkID=120878>) (978-1-932577-41-9), copyright November 2007, all rights reserved. No part of this chapter may be reproduced, stored in a retrieval system, or transmitted in any form or by any means—electronic, electrostatic, mechanical, photocopying, recording, or otherwise—without the prior written permission of the publisher, except in the case of brief quotations embodied in critical articles or reviews.)

This chapter briefly looks at the history of applications that have contributed to where we currently find ourselves in the Microsoft performance management roadmap. We also take a high-level look at the Monitoring architecture and just what pieces are necessary to produce the dashboard solutions end users really want.

PerformancePoint Planning

The Planning component of PerformancePoint Server 2007 is not covered in this book. Originally, we were going to write a single Rational Guide covering the Monitor, Analyze, and Plan paradigm in one publication, but there was simply too much to cram into one guide. So we wrote a companion book, [The Rational Guide to Planning with Microsoft® Office PerformancePoint Server 2007](http://go.microsoft.com/fwlink/?LinkID=120879) (<http://go.microsoft.com/fwlink/?LinkID=120879>), available from www.rationalpress.com. Each book provides specific details about its particular aspect of the PPS product. Wherever possible, we’ll note how the two halves of the product can interact.

Monitoring History

The Monitoring part of PerformancePoint is very definitely not a v1 product, as many would think. The software discussed in this Rational Guide is the end product of quite a few years of evolution, integration, and development.

While there were certainly many smaller steps along the way, the major punctuation marks in the lead up to the product we are writing about are summarized in Figure 2.1.

In 2004, Microsoft released the Business Scorecard Accelerator. This was a completely SharePoint Portal-based solution for creating KPIs and grouping them underneath specifically defined objectives and perspectives in a scorecard.

In the second half of 2005, Business Scorecard Manager 2005 (originally codenamed Maestro) was released. BSM provided much enhanced functionality in creating scorecard-centric dashboards, complete with interactive reports. BSM used the base SharePoint product included with Windows Server 2003 licenses as the delivery mechanism; reliance on the SharePoint Portal Server product was removed. BSM shipped with a development and management application named BSM Builder to create KPIs and scorecards and manage the central web service.

In April 2006, Microsoft acquired ProClarity, one of the world leaders in analytic and visualization technologies, an area where Microsoft found itself a bit behind. The BSM team in Redmond were already hard at work on the next version of BSM, codenamed Concerto. The dashboarding and analytical technology acquired from ProClarity was to be merged with this new version. At the same time, another team was working on a completely new budgeting and forecasting tool codenamed Biz# (pronounced Biz Sharp). There was some speculation as to just how many specific products would result from all this. In mid-2006, it was announced that the next version of BSM (Monitor), the acquired technology from ProClarity (Analyze), and the fruits of the Biz# team's labor (Plan) would become PerformancePoint Server 2007.



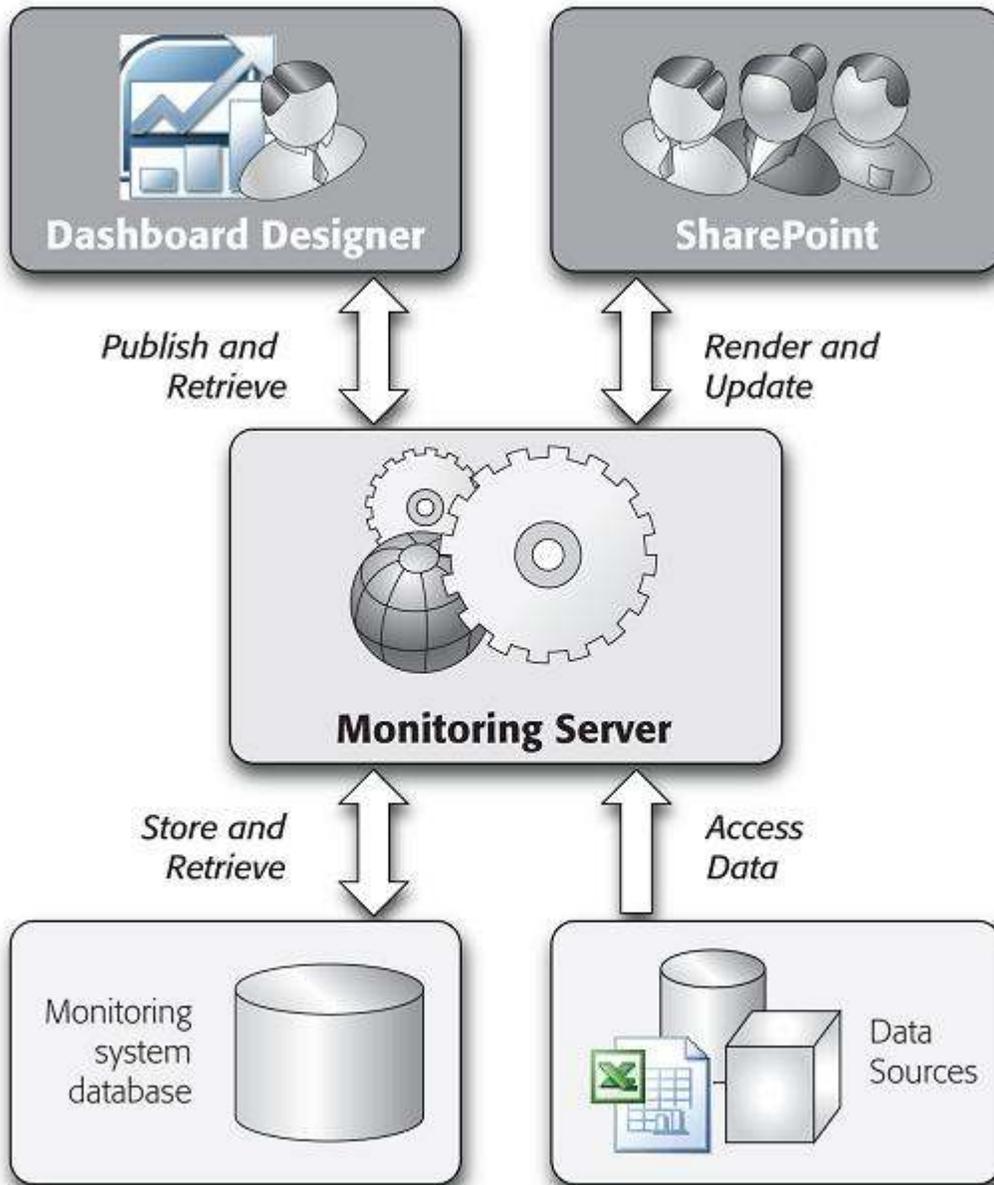
Note:

The integration of the next version of BSM and ProClarity technology was a prime objective of the two teams: Microsoft in Redmond and ProClarity in Boise, Idaho. The current functionality of Monitoring does not yet encompass the full breadth of the ProClarity toolset. However, a PerformancePoint license does extend to the full ProClarity suite, so while they may not be an integrated part of the product itself, decomposition trees, performance maps, or perspective views can still be surfaced in dashboards using the ProClarity server products. Subsequent versions of PerformancePoint will incorporate more of the ProClarity features into the base product, along with a few new ones.

Architecture

The architecture of Monitoring is really quite simple. It is centered around the Monitoring server web service as seen in the simplified architecture diagram in Figure 2.2. Dashboard Designer (DD) is the primary design tool and management interface to the Monitoring server web service. DD is used to build and publish XML definitions of elements to the web service; these XML definitions are stored in a SQL database managed by the Monitoring server. When users interact with published dashboards, SharePoint 2007 retrieves element definition and security information from the Monitoring system database, queries data from configured business data sources, and then exposes the finished product to users using custom Dashboard web parts.

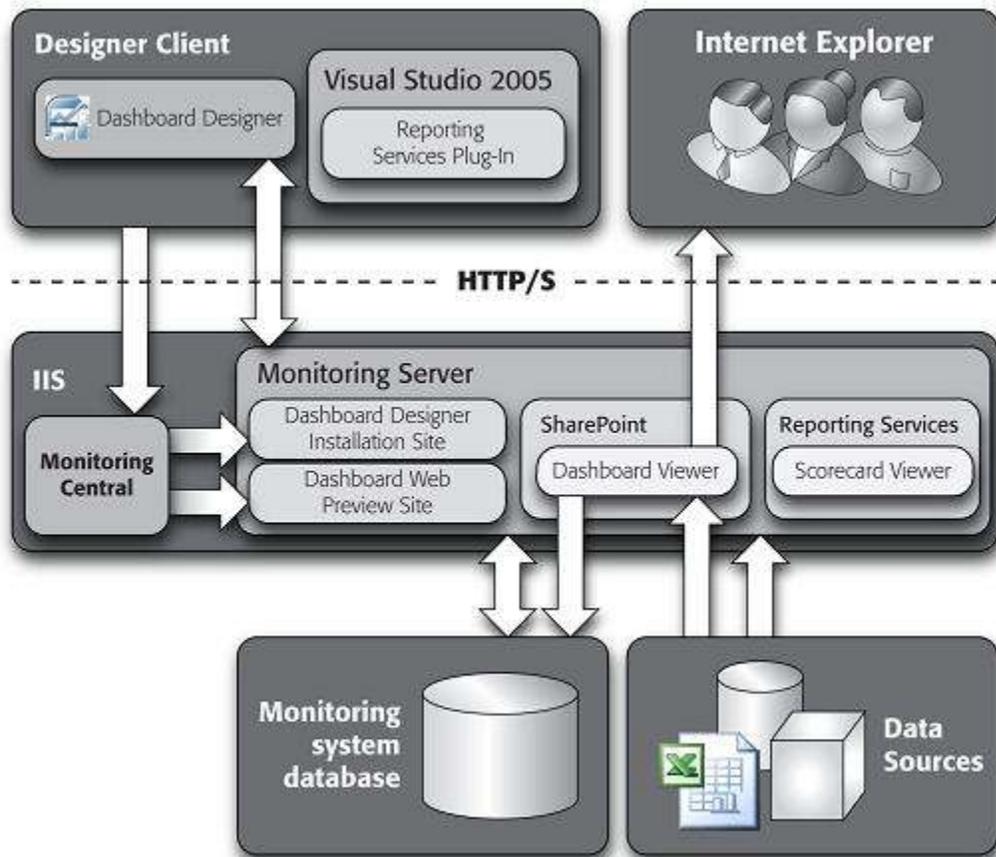
Figure 2.2: Simplified Monitoring Architecture.



Components

A number of different components make up the Monitoring server installation. Depending on the desired architecture, these components can be installed on any machine that meets the minimum requirements. We will go through the installation process and hardware and software requirements in the next chapter. In the meantime, the more fleshed out architecture diagram in Figure 2.3 shows more detail on where each component fits within a complete Monitoring server.

Figure 2.3: Monitoring Component Architecture.



Let's review the components.

- **Dashboard Designer** — Primary application for building out element definitions and management interface to the Monitoring server.
- **Monitoring Server** — The central engine that controls all Monitoring processes; manages element definitions published through Dashboard Designer in the Monitoring Database, surfaces dashboards through SharePoint web parts.
- **Monitoring System Database** — A SQL Server 2005 relational database used to store and manage element definitions.
- **Dashboard Viewer for SharePoint Services** — Facilitates deployment and viewing of completed dashboard content through SharePoint. Custom web parts render individual items contained in published dashboard pages.
- **Monitoring Central** — A launch pad site that is created on any machine is running a Monitoring server web service. The site contains links to the local Dashboard Designer installation site as well as the Dashboard Designer preview site (see Figure 2.4).

-
- **Dashboard Designer Installation Site** — Site from which Dashboard Designer can be installed using ClickOnce technology.
 - **Dashboard Web Preview Site** — ASP.NET preview site used to emulate the dashboard viewer functionality. This site enables designers to test the functionality of their dashboards without the need for a complete SharePoint installation.
 - **Scorecard Viewer for Reporting Services** — Data extension that enables Reporting Services to generate and render Report Definition Language (.rdl) files based on the definition of a scorecard.
 - **Reporting Services Plug-in (VS2005)** — Data extension that allows developers to view generated scorecard .rdl files in Visual Studio 2005 using the Report Designer plug-in.

Elements

Elements are the essential building blocks of Monitoring. They are created using Dashboard Designer and subsequently published to the Monitoring server. Each element plays an important role in a complete performance management solution. There are six elements in total: indicators, data sources, KPIs, scorecards, reports, and dashboards. Many of the six elements depend on definitions of another element type in order to be complete. These relationships form a simple hierarchy that can be seen in Figure 2.5.

Let's look at each of the elements.

- **Data Sources** — Contain connection settings that are used to gain access to various types of structured data. KPIs and reports utilize this element to access the data they require.
- **Indicators** — Provide visual prompts pertaining to the status of a particular KPI. They use differing graphics, background colors, or text settings to convey their message.
- **KPIs (Key Performance Indicators)** — Bring metrics together from one or more data sources in order for comparisons or calculations to be made. These elements utilize more than one data source element and more than one indicator element as part of their definition.
- **Scorecards** — Collections of one or more KPIs organized hierarchically under a series of zero or more objectives or grouped by members of a dimension. Scorecards provide the mechanism for both grouping and rolling up the values contained in their constituent KPIs.
- **Reports** — Expose business data in a number of different formats in order to suit requirements. There are many report type options available, ranging from Analytic Grids or Charts to SQL Reporting Services reports. Some report types connect to data using a data source element; others use data from a scorecard or a connection defined within the report itself.
- **Dashboards** — Bring all the elements together by exposing the data contained in scorecard and report elements. They are the delivery mechanism to the end user in SharePoint via the Dashboard Item web part. Dashboards contain all the logic used to control what the user sees, and how they can interact with the elements contained therein.

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Monitoring Server topology

There are two topologies for PerformancePoint Monitoring Server: stand-alone and distributed.

- A stand-alone topology has all Monitoring Server components installed on a single computer. The primary purpose for a stand-alone installation is for testing and evaluation.
- A distributed topology has Monitoring Server installed on multiple computers. A distributed installation can be scaled up or out as more users are added.

Performance data can be found in this [white paper](http://technet.microsoft.com/en-us/library/bb660539.aspx) (<http://technet.microsoft.com/en-us/library/bb660539.aspx>) to help guide your choices regarding individual server configurations.

PerformancePoint Server 2007 support for extranets, hosting and external connector

Extranets (specifically, authenticating users on computers that are not joined to a trusted Active Directory directory service domain) are not supported by PerformancePoint Server 2007. We are investigating options to provide this support in a future release.

PerformancePoint Server 2007 does not support single-server multi-tenant environments. Customers must deploy multiple servers to achieve a multi-tenant environment for data or user accounts. We are investigating options to provide this support in a future release.

The External Connector (EC) license does not imply or declare product capability (such as extranet or hosting support). The EC is simply an alternative licensing model to CALs that permits any number of external users with a valid Active Directory domain account on a computer joined to a trusted domain to access PerformancePoint Server 2007.

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See Also

[Stand-alone installation](#)

[Distributed installation](#)

Stand-alone installation

All PerformancePoint Monitoring Server components can be installed on a single computer. This is a stand-alone deployment, and it is used primarily for testing, development, and proof of concept for Monitoring Server.

Monitoring Server installation occurs in two steps. First, the PSCSrv.msi file runs and copies all necessary installation files to the hard disk on the local computer. Second, the PerformancePoint Monitoring Server Configuration Manager starts and configures newly copied files to complete the Monitoring Server installation.

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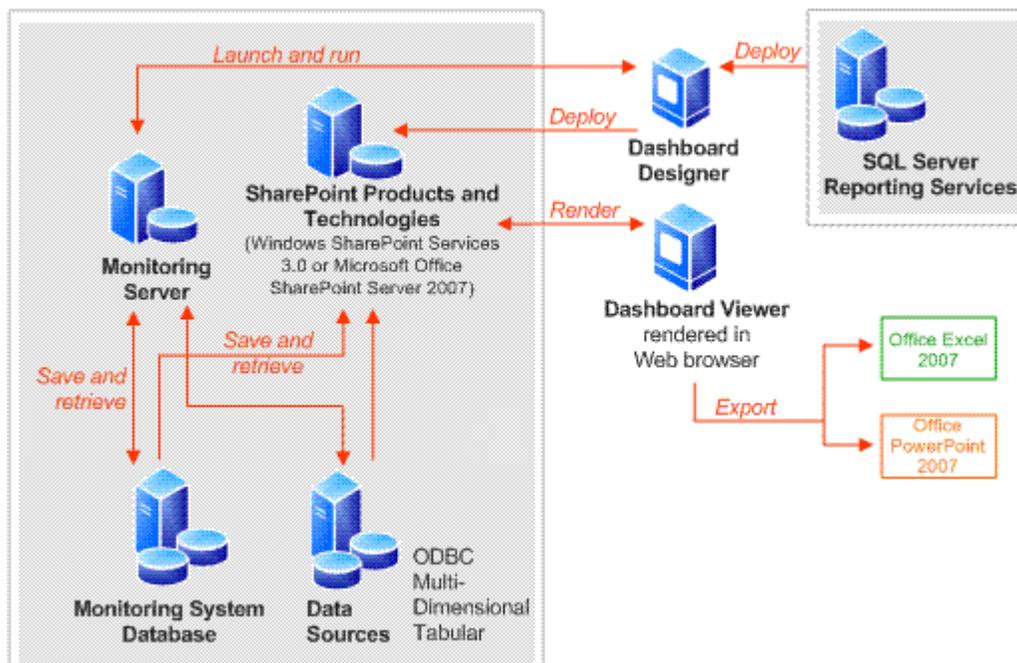
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Distributed installation

These are the components in the PerformancePoint Monitoring Server distributed topology.

1. PerformancePoint Monitoring System Database. This database stores the definitions of the dashboard elements and the definition of the dashboard itself. Dashboard Designer, using the PerformancePoint Monitoring Server Web Service, adds all definitions to the database. Dashboard Viewer for SharePoint Services reads this database to display the dashboards to end users.
2. PerformancePoint Monitoring Server, which has three components:
 - a. PerformancePoint Monitoring Server Web Service. This is a Web service that PerformancePoint Dashboard Designer uses to build dashboards and to store the definitions in the Monitoring System Database.
 - b. PerformancePoint Dashboard Web Preview. This is an Internet Information Services (IIS) Web site that is used for rendering dashboards for preview and development scenarios. This preview site can reside on one or more Windows Server computers.
 - c. Monitoring Central. This is an IIS Web site used to distribute Dashboard Designer, which can also reside on one or more Windows Server 2003 computers.
3. Dashboard Viewer for SharePoint Services. This is a Web Part that is used to render and display dashboards. This Web Part includes Web services from the Monitoring Server Web Service and rendering capabilities.

The following diagram illustrates a distributed Monitoring Server deployment, in which the server components are installed on separate computers.



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Monitoring Server components

Monitoring Server has the following components that work together to provide monitoring and reporting functionality to PerformancePoint. These components are installed and configured during deployment.

Monitoring Server's components are as follows:

- **PerformancePoint Dashboard Designer** A desktop application you use to develop dashboards. For more information, see PerformancePoint Dashboard Designer.
- **PerformancePoint Monitoring System Database** A SQL Server database that stores all Monitoring Server data and configuration settings.
- **PerformancePoint Monitoring Server** Used by Dashboard Designer and Microsoft SQL Server databases that contain Monitoring Server metadata. Metadata includes user permissions and settings for dashboard elements, such as key performance indicators (KPIs), dashboards, other indicators, and data sources. You can have this data installed on one or more computers.
- **PerformancePoint Monitoring Server Web Service** A collection of Application Programming Interfaces (APIs) that provide the core functionality of PerformancePoint Monitoring Server. PerformancePoint Monitoring Server Web Service connects PerformancePoint Dashboard Designer to the Monitoring Server database, the Dashboard Viewer to SharePoint Services, and all data sources.
- **PerformancePoint Dashboard Web Preview** An Internet Information Services (IIS) Web site that is used for rendering dashboards for preview and development scenarios. Dashboard Web Preview can reside on one or more Windows computers.
- **Monitoring Central** A Web site from which users can install Dashboard Designer, view product documentation, and open the Dashboard Web Preview site. Note that the Dashboard Designer installation includes an IIS Web site that is used to distribute the program.
- **SQL Server 2005 SP2 Reporting Services integration** Reporting services that provide detailed information about Monitoring Server databases.
- **PerformancePoint Dashboard Viewer for SharePoint Services** A Web Part that is used to render and display dashboards. The Web Part includes Web services from Monitoring Server Web Service, as well as rendering capabilities for rendering dashboards. The Dashboard Viewer for SharePoint Services can be installed on one or more SharePoint sites, or it can be installed in a SharePoint Services Web farm.
- **PerformancePoint Monitoring Plug-In for Report Designer (Visual Studio 2005)** An add-in to the Reporting Services Report Designer. This add-in allows Report Designer to create reports with scorecards in them.
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See Also

[PerformancePoint Monitoring System Database](#)

PerformancePoint Monitoring System Database

PerformancePoint Monitoring Server uses a single SQL Server application database. The database stores reports, data sources, dashboards, and other supporting metadata for dashboard elements. The various dashboard elements are created in Dashboard Designer and secured using a role-based security model, which is also stored in the database. Monitoring Server databases must run on SQL Server 2005 with the most recent service pack.

The stored metadata consists of the definitions for data sources, key performance indicators (KPIs), scorecards, analytic reports and views, and dashboards. Monitoring Server, Dashboard Viewer for SharePoint Services, Scorecard Viewer for Reporting Services, and Monitoring Plug-in for Report Designer (Visual Studio 2005) all retrieve dashboards and dashboard element definitions from this database. Dashboard Designer publishes dashboard and dashboard element definitions to this database.

Monitoring Server Configuration Manager provides the ability to install a new database to act as the Monitoring System database. This can be done either by creating it during initial configuration of Monitoring Server, or by having the database created in advance, before Monitoring Server Configuration Manager is started. The latter option is called *provisioning*.

The provisioning option supports the scenario in which creation of the database is managed centrally in a data center and the installing user does not have privileges to create databases. By choosing the provision option, you enable the database schema to be installed over the empty database. The database name can be customized.

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See Also

[Monitoring Server components](#)

PerformancePoint Dashboard Designer

Dashboard Designer is the desktop application that creates and manages dashboards and their elements, including scorecards, parameters, and strategy maps. Dashboards help organizations measure, monitor, and manage business performance with live data from a variety of business data sources. Dashboard Designer can track key performance indicators (KPIs) that consolidate data from multiple data sources into a scorecard or strategy map that is visual, intuitive, and interactive.

After you complete your dashboards, you can use Dashboard Designer to publish them to Windows SharePoint Services 3.0 or Microsoft Office SharePoint Server 2007, or you can import them directly into a Microsoft Excel spreadsheet or Microsoft PowerPoint presentation.

Dashboard Designer lets you easily create and manage the following views and elements:

- **Scorecard elements** Individual elements of any given scorecard.
- **Key performance indicators (KPIs)** Business metrics that help decision-makers at all levels of an organization monitor progress toward meeting organizational performance goals. By using data directly from a data source, KPIs can measure an organization's performance in a specific area, such as total sales, parts inventory, or sales per region. KPIs can provide a logical and comprehensive way of describing organizational strategy when organizational stakeholders carefully plan which KPIs to use in their dashboards.
- **Data sources** The actual data that Dashboard Designer KPIs use. Data sources include relational databases; online analytical processing (OLAP) cubes; Excel spreadsheets; SharePoint lists; or any other Open Database Connectivity (ODBC), Excel Services, or ADOMD.NET data source.
- **Indicators** Graphical representations of the status of a KPI or dashboard when it is compared to a destination. Indicators translate numeric values into colors and icons to emphasize and clarify the status.
- **Dashboards** Mechanisms that display hierarchical arrangements of KPIs. Dashboard Designer lets you define multiple filters for a dashboard, such as filters defined over time, by geography, or against different KPI destinations. When you publish dashboards to a SharePoint site, users can navigate them by using page filters and drill-up/drill-down functionality.
- **Reports** Reports are forms that provide supporting data, such as detailed charts, Pivot Tables, spreadsheets, and SQL Server reports that are based on dashboard data. These reports can present data that is not sourced from dashboard data sources, such as spreadsheets and Web pages. They can be connected to dashboards so that selections made in the dashboard determine what is displayed in the report. Examples include:
 - **Strategy maps** Models of how an organization will create value. Create a strategy map in Microsoft Visio 2007 and then insert it into Dashboard Designer to show how a performance goal will be achieved.
 - **Trend analysis reports** Forms that show the historical performance of data in a dashboard. These reports include the option to use SQL Server data-mining algorithms to generate projections on future data values.

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Monitoring Server system requirements

The following software prerequisites must be satisfied before you install PerformancePoint Monitoring Server.

- Either Office SharePoint Server 2007 or Windows SharePoint Services must be installed in order to successfully install and use Monitoring Server. Monitoring Server supports Excel Services as a report type and data source, but is supported only with Office SharePoint Server 2007 installed instead of Windows SharePoint Services 3.0. To review the difference between these SharePoint Products and Technologies, see [Which SharePoint technology is right for you](http://office.microsoft.com/en-us/sharepointtechnology/FX101758691033.aspx?ofcresset=1) (<http://office.microsoft.com/en-us/sharepointtechnology/FX101758691033.aspx?ofcresset=1>).

The terms "Windows SharePoint Services" and "SharePoint Services" are used collectively in PerformancePoint Server documentation to refer to Office SharePoint Server 2007 and Windows SharePoint Services 3.0.



Important:

Office Web Components are not supported on PerformancePoint Server 64-bit deployments. These components are 32-bit only and are not compatible with the 64-bit implementation of PerformancePoint Server even though these components may run on a 64-bit computer when 32-bit Internet Explorer hosts the Office Web Components. This is a known issue and is not supported.

Clients

Product	Supported operating system	Additional requirements	Supported browsers
PerformancePoint Dashboard Designer	Windows Server 2003 (SP2 and R2), 32-bit and 64-bit Windows Server 2008, 32-bit and 64-bit Windows XP (excluding XPe), SP2 Microsoft Vista® (Business, Business N, Enterprise) 32-bit and 64-bit	ADOMD.NET 9.0 MSXML 6.0 + updates SQL Server 2005 SP2 Analysis Services server OLE DB 9.0 Provider + Cumulative Update 9.00.3186 (kb939537) SQL Server 2000 Analysis Services server Service Pack 4 - Build 2174 for Client Systems (to use SQL Server 2000 Analysis Services server as a data source) Microsoft .NET	not applicable

Product	Supported operating system	Additional requirements	Supported browsers
		Framework 2.0 Report Viewer for SQL Server 2005, 2005 SP1, or SQL Server 2008 depending on your configuration	
PerformancePoint Add-in for Report Designer	Windows Server 2003 (SP2 and R2), 32-bit and 64-bit Windows Server 2008, 32-bit and 64-bit Windows XP (excluding XPe), SP2 Microsoft Vista® (Business, Business N, Enterprise) 32-bit and 64-bit	Microsoft .NET Framework 2.0 Microsoft Visual Studio .NET 2005 with SQL Server 2005 SP2 Report Designer The Report Designer component can be found on the SQL Server 2005 CD by installing Business Intelligence Development Studio (BIDS)	not applicable
PerformancePoint Dashboard Client	Windows Server 2003 (SP2 and R2), 32-bit and 64-bit Windows Server 2008, 32-bit and 64-bit Windows XP (excluding XPe), SP2 Microsoft Vista® (Business, Business N, Enterprise) 32-bit and 64-bit	not applicable	Microsoft Internet Explorer 6 Windows Internet Explorer 7

Server and services

Product	Supported operating systems	Additional requirements	Supported browsers
PerformancePoint Monitoring Server Configuration Manager	Windows Server 2008, 32-bit and 64-bit Windows Server 2003 (SP2 and R2), 32-bit and 64-bit	Microsoft .NET Framework 2.0 Microsoft ASP.NET 2.0 SQL Native Client 9.0 SP2	not applicable
PerformancePoint Monitoring Server	Windows Server 2008, 32-bit and 64-bit Windows Server 2003 (SP2 and R2), 32-bit and 64-bit	Internet Information Services (IIS) 5.1 (XP) 6.0, or IIS 7.0 with IIS Metabase and IIS 6 configuration compatibility, and IIS 6.0 Isolation Mode Microsoft .NET Framework 2.0 Microsoft ASP.NET 2.0 Microsoft ASP.NET AJAX 1.0 SQL Server 2005 Analysis Management Objects 9.0 SP2 SQL Server 2005 Native Client 9.0 SP2 SQL ADOMD.NET 9.0 MSXML6.msi + updates SQL Server 2005 SP2 Analysis Services OLE DB 9.0 Provider + Cumulative Update 9.00.3186 (kb939537) SQL Server 2000 Analysis Services Service Pack 4 — Build 2174 for Client Systems (to use SQL Server 2000 Analysis Services as a data source)	Microsoft Internet Explorer 6 Windows Internet Explorer 7
PerformancePoint	Windows Server	Internet Information	Microsoft Internet

Product	Supported operating systems	Additional requirements	Supported browsers
Dashboard Server Web Part for Windows SharePoint Services	2008, 32-bit and 64-bit Windows Server 2003 (SP2 and R2), 32-bit and 64-bit	Services (IIS) 6.0, or IIS 7.0 with IIS Metabase and IIS 6 configuration compatibility, IIS 6.0 Isolation Mode Microsoft Office SharePoint Server 2007 or Windows SharePoint Services 3.0 (SP1 for Windows Server 2008) Microsoft .NET Framework 2.0 Microsoft ASP.NET 2.0 Microsoft ASP.NET AJAX 1.0 SQL Server 2005 Analysis Management Objects 9.0 SP2 SQL Server 2005 Native Client 9.0 SP2 SQL ADOMD.NET 9.0 MSXML6.msi + updates SQL Server 2005 SP2 Analysis Services OLE DB 9.0 Provider + Cumulative Update 9.00.3186 (kb939537) SQL Server 2000 Analysis Services Service Pack 4 — Build 2174 for Client Systems (to use SQL Server 2000 Analysis Services as a data source)	Explorer 6 Windows Internet Explorer 7
PerformancePoint Scorecard Viewer for Reporting Services	Windows Server 2008, 32-bit and 64-bit Windows Server	Microsoft Office PerformancePoint Monitoring Server 2007 Microsoft SQL Server	not applicable

Product	Supported operating systems	Additional requirements	Supported browsers
	2003 (SP2 and R2), 32-bit and 64-bit	2005 SP2 Reporting Services Server	
PerformancePoint Monitoring System database	Windows Server 2008, 32-bit and 64-bit Windows Server 2003 (SP2 and R2), 32-bit and 64-bit	Microsoft SQL Server 2005 SP2 Standard Edition + Cumulative Update 9.00.3186 (kb939537)	not applicable

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Monitoring Server hardware requirements

The following table shows the hardware requirements for PerformancePoint Monitoring Server.

Component	Hardware requirement
Dashboard Designer	<p>Minimum:</p> <ul style="list-style-type: none">• 1x Pentium 3 CPU• CPU speed: 1 gigahertz (GHz)• 1.5 gigabytes (GB) of RAM• 512 MB available hard disk space• 1000-MB network interface card <p>Recommended:</p> <ul style="list-style-type: none">• 1x dual-core, 32-bit CPU• CPU speed: 2.5 GHz• 2 GB of RAM• 2 GB available hard disk space• 1000BASE-T network interface card
PerformancePoint Monitoring Plug-In for Report Designer	<p>Minimum:</p> <ul style="list-style-type: none">• 1x Pentium 3 CPU• CPU speed: 1 GHz• 1.5 GB of RAM• 512 MB available hard disk space• 1000-MB network interface card <p>Recommended:</p> <ul style="list-style-type: none">• 1x dual-core, 32-bit CPU• CPU speed: 2.5 GHz• 2 GB of RAM• 2 GB available hard disk space• 1000-MB network interface card
Monitoring Server Configuration Manager	<p>Minimum:</p> <ul style="list-style-type: none">• 1x Pentium 4 CPU• CPU speed: 2.5 GHz• 2 GB of RAM

Component	Hardware requirement
	<ul style="list-style-type: none"> • 1 GB available hard disk space • 1000-MB network interface card <p>Recommended:</p> <ul style="list-style-type: none"> • 2x dual-core, 64-bit CPUs • 4 GB of RAM • 5 GB available hard disk space • 7200 RPM IDE drive • 1000-MB network interface card
Monitoring Server	<p>Minimum:</p> <ul style="list-style-type: none"> • 1x Pentium 4 CPU • CPU speed: 2.5 GHz • 2 GB of RAM • 1 GB available hard disk space • 1000-MB network interface card <p>Recommended:</p> <ul style="list-style-type: none"> • 2x dual-core, 64-bit CPUs • 4 GB of RAM • 5 GB available hard disk space • 7200 RPM IDE drive • 1000-MB network interface card
Dashboard Viewer for SharePoint Services	<p>Minimum:</p> <ul style="list-style-type: none"> • 1x Pentium 4 CPU • CPU speed: 2.5 GHz • 2 GB of RAM • 1 GB available hard disk space • 1000-MB network interface card <p>Recommended:</p> <ul style="list-style-type: none"> • 2x dual-core, 64-bit CPUs • 4 GB of RAM • 5 GB available hard disk space • 7200 RPM IDE drive • 1000-MB network interface card
Scorecard Viewer for Reporting Services	<p>Minimum:</p>

Component	Hardware requirement
	<ul style="list-style-type: none"> • 1x Pentium 4 CPU • CPU speed: 2.5 GHz • 2 GB of RAM • 1 GB available hard disk space • 1000-MB network interface card <p>Recommended:</p> <ul style="list-style-type: none"> • 2x dual-core, 64-bit CPUs • 4 GB of RAM • 5 GB available hard disk space • 7200 RPM IDE drive • 1000-MB network interface card
Monitoring System Database	<p>Minimum:</p> <ul style="list-style-type: none"> • 1x Pentium 4 CPU • CPU speed: 2.5 GHz • 2 GB of RAM • 1 GB available hard disk space • 1000-MB network interface card <p>Recommended:</p> <ul style="list-style-type: none"> • 2x dual-core, 64-bit CPUs • 4 GB of RAM • 5 GB available hard disk space • RAID5 hard disk array • 1000-MB network interface card

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Monitoring Server system dependencies

PerformancePoint Monitoring Server supports:

- Windows Server 2003 (Service Pack 2 or R2)
- Windows Server 2008

Monitoring Server can be used with:

- Windows XP Service Pack 2
- Windows Vista



Important:

Running Monitoring Server on a client operating system is only recommended in a dashboard development environment.

Monitoring Server with the 32-bit and 64-bit versions of Office SharePoint Server 2007 and Windows SharePoint Services 3.0

Office SharePoint Server 2007 and Windows SharePoint Services 3.0 have 32-bit and a 64-bit versions. The 32-bit version runs on 32-bit computers only. This means it does not run on a 64-bit computer that is running Internet Information Services (IIS) in 32-bit mode. To run SharePoint Server 2007 or Windows SharePoint Services 3.0 on a 64-bit computer, you must install the 64-bit version.

PerformancePoint Dashboard Viewer for SharePoint Services also has a 32-bit version and a 64-bit version. Install the 32-bit version on a 32-bit computer, and install the 64-bit version on 64-bit computer.

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See Also

[Monitoring Server hardware requirements](#)

Monitoring Server product dependencies

PerformancePoint Monitoring Server depends on Microsoft SQL Server 2005 Service Pack 2 (SP2) and on Microsoft Office SharePoint Server 2007 or Windows SharePoint Services 3.0. SQL Server 2005 provides the back-end scalability and stability, while SharePoint Products and Technologies provide the front-end scalability and stability.

Monitoring Server considerations for these programs are:

- SQL Server 2005 SP2: Although the minimum requirement for SQL Server is Service Pack 2, we recommend also installing the latest available knowledge base (KB) article hot fixes.
- Office SharePoint Server 2007: The minimum requirement for Dashboard Viewer for SharePoint Services is Windows SharePoint Services 3.0. However, we recommend installing Office SharePoint Server 2007.

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See Also

[Monitoring Server system requirements](#)

Monitoring Server client access requirements

PerformancePoint Monitoring Server has two clients: Dashboard Viewer for SharePoint Services and PerformancePoint Dashboard Designer.

Dashboard Designer uses PerformancePoint Monitoring Server Web Service to build and deploy dashboards. Dashboard Viewer for SharePoint Services uses the HTTP protocol and Web browser rendering capabilities to display dashboards for end users.

Dashboard Viewer for SharePoint Services

Most users view a dashboard through Dashboard Viewer for SharePoint Services, which is installed on a SharePoint Server 2007 Web site.

 **Note:**

The SharePoint sites where you install Monitoring Server components must have at least one document library that is accessible to Monitoring Server as a place to deploy dashboards.

Some of the default templates, such as "Blank Site" and "Report Center," do not include a document library, so if you use those templates, you must create a document library yourself.

PerformancePoint Dashboard Designer

Dashboard Designer is the tool used to create dashboard elements and dashboards. This tool is distributed through the Monitoring Central Web site, which provides Click-Once installation of Dashboard Designer. Dashboard Designer exports completed dashboards to a SharePoint site.

 **Note**

- In order to use Reporting Services in Dashboard Designer, Report Viewer must be installed on the client computer running Dashboard Designer. Depending on which SQL Server database, install from one of the following.

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Monitoring Server service dependencies

Microsoft Internet Information Services (IIS) is a dependency for all components of PerformancePoint Monitoring Server. Because Monitoring Server supports both client operating systems (Windows XP Service Pack 2 (SP2) and Windows Vista) and server operating systems (Windows Server 2003 and Windows Server 2008), many versions of IIS are supported.

Windows XP SP2 has IIS 5.1, while Windows Server 2003 has IIS 6.0, and Windows Vista and Windows Server 2008 have IIS 7.0. All of these versions of IIS are supported by Monitoring Server.

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Monitoring Server roles and security

Monitoring Server has several roles for individuals who perform various activities. In small organizations, one or only a few persons may be responsible for administering all the features of Monitoring Server. In larger organizations, one group may be administrators on the system, whereas another group creates libraries for reports and key performance indicators (KPIs), while a third group designs and builds dashboards.

Permissions are granted to roles, and permission is applied to any user who belongs to a role.

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See Also

[Monitoring Server roles](#)

[Monitoring Server element roles](#)

[Monitoring Server security options](#)

[Monitoring Server account considerations](#)

[Monitoring Server application pool accounts](#)

[Monitoring Server security considerations](#)

Monitoring Server roles

There are four types of server roles for Monitoring Server:

- **Administrator** This role provides complete control over Monitoring Server and access to all dashboard data. A member of the Administrator role can create, edit, and delete all dashboard elements, and can publish to the server. Members of the Administrator role have access to the Server Administration console, which is used to grant object and server roles to other users. The administrator group on the computer running Monitoring Server is automatically added to this role, and it cannot be removed.
- **Creator** This role enables users to create reports, key performance indicators (KPIs), scorecards, and other indicators. Members of the Creator role can publish dashboard elements to Monitoring Server. A Creator member can also delete elements if there is Editor permission on the element. After an element has been created, the identity of the Creator member is automatically added to the Editor role of the element.



Important:

End users are only allowed access to data that a Creator member or Administrator member grants to them. However, one important exception is when users navigate analytic reports generated against SQL Server Analysis Services. Some of the more complex navigation options allow readers of the report to see more data than the Creator member who created the content intended. To prevent end users from seeing data that they are not authorized to see in Analytic reports, secure that data directly in Analysis Services, rather than trying to use the application security available in Monitoring Server.



Note

- End users that require the ability to publish to the preview site will need additional permissions to access the Preview folder itself. (The default path for the Preview folder is; C:\Program Files\Microsoft Office PerformancePoint Server\3.0\Monitoring\PPSMonitoring_1\Preview). While the PerformancePoint creator role allows end users to publish dashboard elements to the monitoring database in SQL Server, the creator role does not include the ability to preview a dashboard. The end user needs additional security permissions for publishing a dashboard element and publishing a dashboard to the preview site.
- **Data Source Manager** This role enables users to create and delete data sources. Members of the Data Source Manager role can also publish data sources to Monitoring Server.
- **Power Reader** This role grants read-only access to all dashboard elements on the Monitoring Server computer. This role is intended for use by service accounts or back-end services that need complete access to the system. Notification services, for example, must be added to this role for alerts to work.

Recommendations for role configuration

After Monitoring Server has been deployed, we recommend that you begin assigning users and groups to roles based on your existing organizational structure. For example, members of the Administrator role should be authorized to view all of the business data that Monitoring Server will use, and they will also be responsible for configuring the rest of the application, including user access permissions.

Next, determine your data source managers. Members of the Data Source Manager role might not be authorized to grant additional permissions to users in the system, but they should be trusted with the available business data. Administrators should then define the set of Creators. Creators are responsible for creating content based on the set of data made available to them by members of the Data Source Manager role and Administrator role. The members of the Creator role are responsible for determining who can see what has been published. Creators do this by using Monitoring Server element roles.

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See Also

[Monitoring Server element roles](#)

Monitoring Server element roles

PerformancePoint Monitoring Server Web Service is organized into dashboard elements that include key performance indicators (KPIs), scorecards, reports, data sources, and other indicators. Dashboard elements are combined with filters, which are then presented to users on a Web page based on Windows SharePoint Services.

Dashboard element roles grant access to data and tasks. Permissions to access these elements are assigned on a per-element basis. Therefore, roles are specific to each KPI, scorecard, report, data source, or other indicator.

There are two element roles: Editor and Reader.

Editor

The Editor role enables members to modify all data related to the KPI, data source, report, or scorecard to which the role's permissions apply. When a user who is a member of the Monitoring Server Administrator role or Data Source Manager role creates an element, that user is automatically added to the Editor element role.



Important:

User access permissions to a data source need to be considered carefully. Any user who is a member of the Data Source Manager role can create a connection to any of the resources that the application pool user has access to. An editor can change the connection information to access a source of the same type that might not have been intended by the data source manager. This consideration is important when giving a user permission to modify or create an ODBC connection, which can be modified to access many of the resources of a computer or network, including accessing local files.

Reader

The Reader role grants members read-only access to a specific dashboard element. Members can view the elements of a dashboard in Dashboard Designer.

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See Also

[Monitoring Server roles](#)

Monitoring Server security options

Monitoring Server provides the following authentication options to SQL Server 2005 Analysis Services and other types of data sources.

- **Application pool identity** The process identity is used for any connections to data sources.
- **Connect per user** The logged-in user identity is used to connect to a data source. Delegation is required for the process to connect on behalf of users.
- **Custom data** (Exclusive to Analysis Services.) An Analysis Services connection string property is used to allow Monitoring Server to pass an authenticated user name. Analysis Services can use this property to define the set of data that is returned. The initial connection to Analysis Services is made by using the application pool identity.

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Developer and test environments

The development, test, and production process is a consideration in the Monitoring Server topology design.

Dashboard Viewer for SharePoint Services, for example, is the production dashboard viewing environment. The preproduction environment is Dashboard Web Preview. This preview site allows dashboard designers to export dashboards to ASP.NET to preview the dashboards before publishing them to Office SharePoint Server for production use.

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Monitoring Server account considerations

There are three built-in user accounts to consider when deciding what account to configure for the application pool identity for Monitoring Server. They are the Local System, Network Service, and Local Service accounts. We recommend using a domain account. Built-in accounts should be used with care as they are not well-suited to general purposes, as described below.

Local System account

The built-in Local System user account has a high level of access privileges and is part of the Administrators group on the local computer. If a worker process identity runs as the Local System user account, that worker process has full access to the entire system. When Internet Information Services (IIS) 6.0 is running in IIS 5.0 isolation mode, the Local System account is the default user account for worker process identities. The Local System account has full access, by default, and is therefore not recommended for use with Monitoring Server. A Local System account should only be used if absolutely necessary.

Network Service account

The built-in Network Service user account has fewer access privileges on the system than the Local System user account, but it is still able to access resources across the network with the credentials of the computer account. For IIS 6.0, we recommend that the worker process identity that is defined for application pools run as the Network Service user account, which is the default setting.

Local Service account

The built-in Local Service user account has fewer access privileges on the computer than the Network Service user account, and those user privileges are limited to the local computer. We recommend that you use the Local Service user account if the worker process does not require access outside the computer on which it is running. The Local Service account should only be used if Monitoring Server is limited to a single computer and has no access to network resources.

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Monitoring Server application pool accounts

The Monitoring Server application process runs as an account that is specified by the application pool identity configuration.

In addition to the built-in Local System, Local Service, and Network Service accounts, a local or network account can be specified. This account requires access to the application database and to any required data sources. If the server is configured for "connect per-user authentication," meaning that the credentials of the individual end user are used for authentication, then the application pool account only needs access to the application database. However, all users must be given access permission to any data sources.

Whenever possible, Monitoring Server should be run with a domain account that has low privileges. The identity should not have access to any resources other than those required by the application.

The Monitoring Server application pool identity runs under the account specified by the Monitoring Server Configuration Manager. The application pool identity that the SharePoint site runs under should be set up with the same account. However, the Monitoring Server Configuration Manager does not change whatever the current setting is, and it is up to the user to change this setting manually. We recommend using a domain account as the application pool identity. The domain account should only be assigned to the IIS_WPG group on the computer that Monitoring Server is installed on.

Monitoring Server Configuration Manager supports specifying a domain account, which is the recommended deployment. Monitoring Server Configuration Manager also supports specifying a built-in account. Monitoring Server Configuration Manager automatically assigns the selected account access to the metadata stored in the application database. By default, this account needs to be manually assigned permissions to each of the data sources that you plan to use.

Data-source authentication

Monitoring Server data sources will often require Monitoring Server to authenticate in order to access the data. By default, Monitoring Server always uses the application pool identity for connecting to any data source. The only exception is data sources that allow administrators to specify a connection string that contains access credentials. In Dashboard Designer, the wizard for creating a SQL Server 2005 Analysis Services data source allows you to specify a set of roles on which to secure the connection to Analysis Services.

Authenticating to data sources as a single user may not provide enough control over access to an organization's business data. Two options are available in Monitoring Server to allow for better access control.

The first option is to use the CustomData field on an Analysis Services connection string. Monitoring Server is able to specify the domain name and user name of the account that is authenticating to the server as the CustomData of the connection string. Then Analysis Services can be configured to restrict access based on the string that contains the user name provided by Monitoring Server.

The second option is to enable Monitoring Server support of Kerberos delegation by enabling the `Bpm.ServerConnectionPerUser` property in the Web.config file. Delegation provides an impersonation token from the currently authenticated user to any registered data source. With Kerberos delegation, each of your users needs access to the data source. This per-user data source access must be registered with both Monitoring Server and the service that users will be connecting to. The advantage to this approach is that you can use the application security models that are available for each registered data source.

Analytic reports and data source security

Support for navigation on Analysis Services reports provides users with the ability to gain understanding of their business beyond what a static report might convey. The report-level security for members of Editor roles and Reader roles allows users to share relevant data to a specific set of people. Editor role or Reader role permissions on an analytic report do not prevent users from seeing the data beyond what the intended view allows. In this situation, security on the data source is the only way to limit access to cube data. Once a user has access to a data source referencing an Analysis Services OLAP cube, the user can see all of the data in that cube unless access is restricted in Analysis Services. By default, Monitoring Server connects as a single user for all data sources.

Data source connection strings

Monitoring Server provides users with the ability to specify their own connection strings for many of the supported data source types. If you choose to specify a set of credentials as part of the connection string, then you need to be aware that these credentials will not be encrypted and can be stored directly in the workspace of whoever has access to the data source.



Caution:

We recommend that you do not supply credentials as part of a connection string.

Deployments of SharePoint Products and Technologies

We recommend that the Monitoring Server application pool identity account match the Monitoring Server Web sites. This ensures that if you are using the default configuration, your reports and scorecards are executed under the same user context. If you choose to use the `Bpm.ServerConnectionPerUser` property, we still recommend simplifying the configuration of Kerberos. Note that the process running your deployment of SharePoint Products and Technologies is going to have access to the metadata repository for Monitoring Server. Make sure that your deployment restricts who can publish content, as those users might be able to access Monitoring Server data.

IIS configuration

In addition to the configuration of the application pool identity and the Web.config file, you must further secure Monitoring Server by enabling SSL for all the relevant Web sites. We do not recommend using anything other than Integrated Windows authentication and using a non-default port. We recommend using Integrated Windows authentication and a default port.

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Monitoring Server security considerations

The following sections describe the security features available in Monitoring Server.

Authentication

Monitoring Server relies on Microsoft Internet Information Services (IIS) domain authentication to authenticate user access to the application. Any active user in a trusted domain has access to the Web service, but without specific object- or server-level roles, the user does not have permission to create or view any metadata on the server.

Monitoring Server is configured with a predefined set of roles in the database repository. Authorization is based on a comparison among the user, the groups that the user belongs to, and the Monitoring Server roles assigned to the user.

Application security

Monitoring Server provides several roles that define the permissions to administer or create dashboard elements. In Dashboard Designer, users and groups from the Active Directory directory service are assigned to these roles.

In addition to the basic roles on the system, there are the dashboard element roles of Editor and Reader, which apply to the individual elements on the server. These dashboard elements include reports, scorecards, and the definition of the dashboard itself.

Kerberos delegation security

Impersonation allows for a Web application or Web service to act on behalf of the identity of another entity in order to access local resources, rather than as the process identity. Delegation allows a Web application or Web service to use the impersonation token to access remote network resources.

Scenarios that require the use of delegation are commonly referred to as "double-hop" scenarios. Delegation operates based on Integrated Windows authentication and the Kerberos protocol.

Monitoring Server requires delegation if the `Bpm.ServerConnectionPerUser` property is set to `True` in the `Web.config` file and the services and Web sites that are registered as data sources are installed on remote computers. The `Bpm.ServerConnectionPerUser` setting forces Monitoring Server to attempt to use the authenticated user's identity when communicating with external data sources, such as Analysis Services.

See the PerformancePoint Server 2007 Deployment Guide for information on configuring Kerberos delegation.

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PerformancePoint Monitoring Server security roadmap

The following security articles relating to PerformancePoint Monitoring Server are available in this product documentation here on Microsoft TechNet. For security articles on PerformancePoint Planning Server, see [PerformancePoint Planning Server security roadmap](#) ([http://technet.microsoft.com/library/062f6b2b-8269-4072-885f-9cf5d196cc21\(Office.12\).aspx](http://technet.microsoft.com/library/062f6b2b-8269-4072-885f-9cf5d196cc21(Office.12).aspx)).

Architecture and planning

[Monitoring Server Security Options](#)

[Monitoring Server account considerations](#)

[Monitoring Server Application Pool Accounts](#)

[Monitoring Server security considerations](#)

Deployment

[Monitoring Server Application Pool Accounts](#)

[Deploying Monitoring Server Securely](#) ([http://technet.microsoft.com/library/80b06ec5-43d1-4635-a8eb-50bc897caba4\(Office.12\).aspx](http://technet.microsoft.com/library/80b06ec5-43d1-4635-a8eb-50bc897caba4(Office.12).aspx))

[Enabling Secure Sockets Layer for Monitoring Server](#) ([http://technet.microsoft.com/library/33f68b8c-8383-43a7-870c-41108ff42f10\(Office.12\).aspx](http://technet.microsoft.com/library/33f68b8c-8383-43a7-870c-41108ff42f10(Office.12).aspx))

[Kerberos authentication and delegation for Monitoring Server](#)

([http://technet.microsoft.com/library/fbea8cbd-1674-4dbe-8d42-63272d06bbe3\(Office.12\).aspx](http://technet.microsoft.com/library/fbea8cbd-1674-4dbe-8d42-63272d06bbe3(Office.12).aspx))

[Configure Monitoring Server prerequisites for Kerberos authentication](#)

([http://technet.microsoft.com/library/6a045558-b719-494f-81eb-9d8db1d0a030\(Office.12\).aspx](http://technet.microsoft.com/library/6a045558-b719-494f-81eb-9d8db1d0a030(Office.12).aspx))

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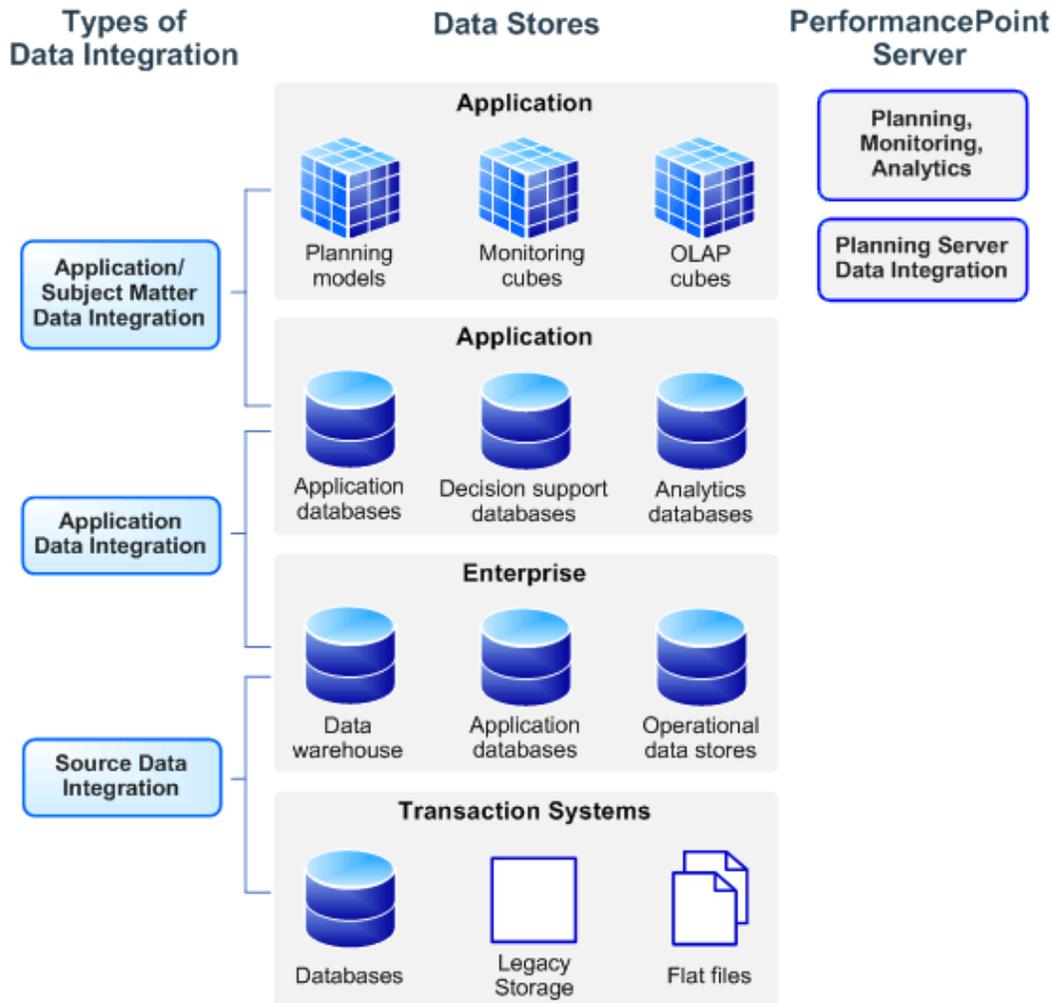
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Monitoring Server: data sources

PerformancePoint Server 2007 integrates data from many disparate sources.



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See Also

[Monitoring Server: exporting to Microsoft Office Excel](#)

[Monitoring Server: exporting to Microsoft Office PowerPoint](#)

[Monitoring Server: planning data sources](#)

[Strategy maps through Microsoft Office Visio](#)

Monitoring Server: exporting to Microsoft Office Excel

End users who view dashboards can export data or data views from a dashboard to Excel. In Excel, users can either view the information or manipulate the data for further analysis.

System requirements

Exporting dashboard content to Excel requires that .NET Framework 3.0 is installed on the computer running Monitoring Server. This is the only server requirement.

 **Warning:**

An Unauthorized Access error may occur if the Users group permissions are set incorrectly in the %System Drive%\Windows\Temp directory on SharePoint Server when a user tries to export a Dashboard component to Office Excel or Office PowerPoint from SharePoint Server. By default, the Users group has Read and Execute permissions for the %System Drive%\Windows\Temp directory. Organizations commonly remove or restrict the User group rights for the Temp directory. The Users group must have **Read & execute** permissions to the Temp directory on SharePoint Server.

On client computers, the Excel file generated by Monitoring Server is in Open XML file format. Excel files in this format are stored with the new file extension .xlsx. The new file format can only be read by Office 2007 clients, or by Excel clients (Excel 2000, Excel 2002, and Excel 2003) that have installed the Microsoft Office Compatibility Pack for Word, Excel, and PowerPoint 2007 File Formats, which is available through the Microsoft Download Center.

Monitoring Server supports multiple report views. These views include: scorecard, analytical chart, analytical grid, strategy map, Reporting Services report, Excel Services Reports, pivot chart, pivot grid, Web report, and trend chart. The functionality used to export to Excel is only supported for some of these views, as shown in the following table.

Report view	Export to Excel?	Comment
Scorecard	yes	
Analytical chart	yes	
Analytical grid	yes	
Strategy map	yes	Not by default
Reporting Services	yes	Using SQL Server Reporting Services to render to Excel

Report view	Export to Excel?	Comment
Excel Services		
Pivot chart	yes	
Pivot grid		
Trend chart	yes	
Web report		

Enabling support for strategy maps

By default, the Report view strategy map is not enabled for exporting to Excel. Strategy maps can only be exported to Excel if the Monitoring Server computer is already set up to support strategy maps through Visio.

To enable support for strategy maps, you need to change the Web.config file for your SharePoint site.

The following is an excerpt from the Monitoring Server settings in the Web.config file:

```
<appSettings>
  <add key="FeedCacheTime" value="300" />
  <add key="FeedPageUrl" value="/_layouts/feed.aspx?" />
  <add key="FeedXsl1" value="/Style Library/Xsl Style Sheets/Rss.xsl" />
  <add key="ReportViewerMessages"
value="Microsoft.SharePoint.Portal.Analytics.UI.ReportViewerMessages,
Microsoft.SharePoint.Portal, Version=12.0.0.0, Culture=neutral,
PublicKeyToken=71e9bce111e9429c" />
  <add key="Bpm.ConnectionString" value="Data Source=localhost;Initial
Catalog=PPSMonitoring;Integrated Security=True" />
  <add key="Bpm.ConnectionPerUser" value="False" />
  <add key="Bpm.ElementMemoryCacheTime" value="5" />
  <add key="Bpm.EnableAnalyticQueryLogging" value="False" />
  <add key="Bpm.UseASCustomData" value="False" />
  <add key="Bpm.IndicatorImageCacheTime" value="10" />
  <add key="Bpm.DataSourceQueryTimeout" value="300" />
  <add key="ExportToExcelEnabledControls"
value="PivotChart,SqlReport,TrendAnalysisChart,Scorecard,OLAPGrid,OLAPChart" />
```

The element that needs to be changed is `ExportToExcelEnabledControls`. To enable strategy maps, add `StrategyMap` to the element value.

Example:

value="PivotChart,SqlReport,TrendAnalysisChart,Scorecard,OLAPGrid,OLAPChart,StrategyMap" />.

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Monitoring Server: exporting to Microsoft Office PowerPoint

End users who view dashboards can export data or data views from a dashboard to Microsoft Office PowerPoint for information sharing.

System requirements

Exporting dashboard content to PowerPoint requires that .NET Framework 3.0 is installed on the computer running Monitoring Server. This is the only server requirement.

 **Warning:**

An Unauthorized Access error may occur if the Users group permissions are set incorrectly in the %System Drive%\Windows\Temp directory on SharePoint Server when a user tries to export a Dashboard component to Office Excel or Office PowerPoint from SharePoint Server. By default, the Users group has Read and Execute permissions for the %System Drive%\Windows\Temp directory. Organizations commonly remove or restrict the User group rights for the Temp directory. The Users group must have **Read & execute** permissions to the Temp directory on SharePoint Server.

On client computers, the PowerPoint file generated by Monitoring Server is in Open XML file format. PowerPoint files in this format are stored with the new file extension .pptx. The new file format can only be read by Office 2007 clients, or by PowerPoint clients (PowerPoint 2000, PowerPoint 2002, and PowerPoint 2003) that have installed the Microsoft Office Compatibility Pack for Word, Excel, and PowerPoint 2007 File Formats, which is available through the Microsoft Download Center.

Monitoring Server supports multiple report views. These views include: scorecard, analytical chart, analytical grid, strategy map, Reporting Services, Excel Services, pivot chart, pivot grid, Web report, and trend chart. The functionality for exporting to PowerPoint is only supported for some of these views, as shown in the following table.

Report View	Export to PowerPoint?	Comment
Scorecard	yes	
Analytical chart	yes	
Analytical grid	yes	
Strategy map	yes	Not by default
Reporting Services		
Excel Services		

Report View	Export to PowerPoint?	Comment
Pivot chart	yes	
Pivot grid		
Trend chart	yes	
Web report		

Enabling support for strategy maps

By default, the Report view strategy map is not enabled for exporting to PowerPoint. Strategy maps can only be exported to PowerPoint if the Monitoring Server computer is already set up to support strategy maps through Visio.

To enable support for strategy maps, you need to change the Web.config file for your SharePoint site.

The following is an excerpt from the Monitoring Server settings in the Web.config file:

```
<appSettings>
  <add key="FeedCacheTime" value="300" />
  <add key="FeedPageUrl" value="/_layouts/feed.aspx?" />
  <add key="FeedXsl1" value="/Style Library/Xsl Style Sheets/Rss.xsl" />
  <add key="ReportViewerMessages"
value="Microsoft.SharePoint.Portal.Analytics.UI.ReportViewerMessages,
Microsoft.SharePoint.Portal, Version=12.0.0.0, Culture=neutral,
PublicKeyToken=71e9bce111e9429c" />
  <add key="Bpm.ConnectionString" value="Data Source=localhost;Initial
Catalog=PPSMonitoring;Integrated Security=True" />
  <add key="Bpm.ConnectionPerUser" value="False" />
  <add key="Bpm.ElementMemoryCacheTime" value="5" />
  <add key="Bpm.EnableAnalyticQueryLogging" value="False" />
  <add key="Bpm.UseASCustomData" value="False" />
  <add key="Bpm.IndicatorImageCacheTime" value="10" />
  <add key="Bpm.DataSourceQueryTimeout" value="300" />
  <add key="ExportToExcelEnabledControls"
value="PivotChart,SqlReport,TrendAnalysisChart,Scorecard,OLAPGrid,OLAPChart"
<add key="ExportToPowerPointEnabledControls"
value="PivotChart,TrendAnalysisChart,Scorecard,OLAPGrid,OLAPChart" />
/>
```

The element that needs to be changed is `ExportToPowerPointEnabledControls`. To enable strategy maps, you need to add `StrategyMap` to the element value.

Example:

```
value="PivotChart,SqlReport,TrendAnalysisChart,Scorecard,OLAPGrid,OLAPChart,StrategyMap" />.
```

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Monitoring Server: planning data sources

You can use PerformancePoint Dashboard Designer to access different kinds of data stores and to combine data from different resources such as SQL Server 2005 tables, Office Excel 2007 worksheets, and multidimensional data from SQL Server 2005 Analysis Services (SSAS). Key Performance Indicators (KPIs) and scorecards can use data from any configured data source. You can also combine multidimensional and tabular data sources in a single scorecard. In contrast, analytic charts and grids must use data from SSAS. To learn how to create a data source in Dashboard Designer, see [Create a data source](http://office.microsoft.com/en-us/performancepoint/HA102408421033.aspx) (<http://office.microsoft.com/en-us/performancepoint/HA102408421033.aspx>) To learn more about managing data sources, see [Best practices for managing Dashboard metadata and data sources](http://technet.microsoft.com/library/b3644a61-08a4-42de-9147-a86677fa8525(Office.12).aspx) ([http://technet.microsoft.com/library/b3644a61-08a4-42de-9147-a86677fa8525\(Office.12\).aspx](http://technet.microsoft.com/library/b3644a61-08a4-42de-9147-a86677fa8525(Office.12).aspx)).

Data source elements

To access data from a supported data source, you must create a data source element in Dashboard Designer and then configure the element. The following are data source elements that Dashboard Designer supports. To see a more detailed description of supported data sources, see [Monitoring Server: supported data sources](#).

- Multidimensional data sources that access SSAS data.
- Tabular data sources that access SQL Server 2005 data tables, Excel 2007 worksheets, Office SharePoint Server 2007 lists, or worksheets in Excel Services. To learn how to configure Excel Services as a data source for Dashboard Designer, see [Configure Excel Services](#).
- Open Database Connectivity (ODBC) compliant data sources.
- Use the interfaces in the [PerformancePoint Server SDK](http://msdn.microsoft.com/en-us/library/bb836514.aspx) (<http://msdn.microsoft.com/en-us/library/bb836514.aspx>) to create a custom data source.



Note:

Make sure that you secure your data source connections. Otherwise, the confidentiality or integrity of the data that you access may be at risk.

Best practices for planning multidimensional data

Designing a database for OLAP is much different from designing for Online Transaction Processing (OLTP). Books and articles such as [OLAP Design Best Practices for Analysis Services 2005](http://go.microsoft.com/fwlink/?LinkId=129356&clcid=0x409) (<http://go.microsoft.com/fwlink/?LinkId=129356&clcid=0x409>), provide important guidelines.

The TechNet article, [Analysis Services Query Performance Top 10 Best Practices](http://go.microsoft.com/fwlink/?LinkId=129358&clcid=0x409) (<http://go.microsoft.com/fwlink/?LinkId=129358&clcid=0x409>), offers guidance on proper cube design, writing efficient multidimensional expressions (MDX), and ensuring sufficient hardware resources. These guidelines are very useful in achieving optimal performance against a SQL Server Analysis Services instance.

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See Also

[Monitoring Server: supported data sources](#)

[Best practices for OLAP cube design and MDX querying](#)

[Configure Excel Services](#)

Monitoring Server: supported data sources

Monitoring Server supports two kinds of data sources: multidimensional and tabular.

Multidimensional data sources

A multidimensional data source (often referred to as a cube) is a set of data that is organized and summarized into a multidimensional structure, which is defined by a set of dimensions and measures. A cube usually corresponds to a functional area of an organization, and cubes are designed to meet the business analysis needs of that functional area.

Monitoring Server supports Microsoft SQL Server Analysis Services (SQL Server 2000 Analysis Services and SQL Server 2005 Analysis Services) as a multidimensional data source.



Note:

A SQL Server 2000 Analysis Services data source is not supported with the 64-bit version of Monitoring Server.

For analytical grids and charts, only SQL Server 2005 Analysis Services is supported.

Tabular data sources

A tabular data source allows the user to connect to a table of data with one or more columns and then define the columns in the table structure as either dimensional or factual data. Defining the data in this way allows users to consider the tabular data source as they would a multidimensional cube for the Scorecard Report view.

Monitoring Server supports the following tabular data sources:

- Excel 2007 (workbook)
- SharePoint list (Windows SharePoint Services 3.0 or Office SharePoint Server 2007)
- Excel Services (Excel Services is only supported on installations of Office SharePoint Server 2007 Enterprise Edition)
- Microsoft SQL Server 2000 or SQL Server 2005 (tables or views) and ODBC

Analytical grids and charts are not supported on tabular data sources.

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Best practices for SQL Server 2005/2008 OLAP cube design and MDX querying

When you are enabling Microsoft SQL Server 2005 and 2008 Analysis Services (SSAS) as a data source for Microsoft Office PerformancePoint Server 2007, proper cube design, efficient multidimensional expressions, and sufficient hardware resources are critical to optimal performance.

This article highlights best practices that help improve the performance of SSAS as a data source for PerformancePoint Server. The first section lists articles that highlight Microsoft SQL Server 2008 enhancements that are specifically designed for business intelligence (BI) solutions, while the second section gives best practices that apply to SSAS 2005/2008 cube design, MDX query optimization, and more.

SQL Server 2008 enhancements for business intelligence

The following articles describe enhancements to SQL Server 2008 that relate to business intelligence.

[Top 10 Performance and Productivity Reasons to Use SQL Server 2008 for Your Business Intelligence Solutions](http://sqlcat.com/top10lists/archive/2009/02/24/top-10-performance-and-productivity-reasons-to-use-sql-server-2008-for-your-business-intelligence-solutions.aspx) (<http://sqlcat.com/top10lists/archive/2009/02/24/top-10-performance-and-productivity-reasons-to-use-sql-server-2008-for-your-business-intelligence-solutions.aspx>) Provides a list, with some details, of the top performance reasons to use SQL Server 2008 for your new business intelligence solutions and to upgrade to SQL Server 2008 for your existing business intelligence solutions.

[SQL Server 2008 Upgrade Technical Reference Guide](http://www.microsoft.com/downloads/details.aspx?FamilyID=66d3e6f5-6902-4fdd-af75-9975aea5bea7&displaylang=en) (<http://www.microsoft.com/downloads/details.aspx?FamilyID=66d3e6f5-6902-4fdd-af75-9975aea5bea7&displaylang=en>) Gives information about upgrading your existing Business Intelligence solutions to SQL Server 2008.

[Scaling Up Reporting Services 2008 vs. Reporting Services 2005: Lessons Learned](http://sqlcat.com/technicalnotes/archive/2008/07/09/scaling-up-reporting-services-2008-vs-reporting-services-2005-lessons-learned.aspx) (<http://sqlcat.com/technicalnotes/archive/2008/07/09/scaling-up-reporting-services-2008-vs-reporting-services-2005-lessons-learned.aspx>) Describes enhancements in performance and scalability to SQL Server Reporting Services 2008.

[Performance Improvements for MDX in SQL Server 2008 Analysis Services](http://msdn.microsoft.com/en-us/library/bb934106.aspx) (<http://msdn.microsoft.com/en-us/library/bb934106.aspx>) Explains where issues can occur in your existing MDX code that will prevent you from experiencing the performance improvements in SQL Server Analysis Services 2008.

[SQL Server 2008 White Paper: Analysis Services Performance Guide](http://www.microsoft.com/downloads/details.aspx?FamilyID=3be0488d-e7aa-4078-a050-ae39912d2e43&DisplayLang=en) (<http://www.microsoft.com/downloads/details.aspx?FamilyID=3be0488d-e7aa-4078-a050-ae39912d2e43&DisplayLang=en>) Describes how application developers can apply query and processing performance-tuning techniques to their SQL Server 2008 Analysis Services OLAP solutions.

Best practices for Analysis Services

- [Analysis Services Query Performance Top 10 Best Practices](http://go.microsoft.com/fwlink/?LinkId=134598) (<http://go.microsoft.com/fwlink/?LinkId=134598>) Covers ten best practices for optimizing Analysis Services query performance.
- [SQL Server Best Practices Article: Identifying and Resolving MDX Query Performance Bottlenecks in SQL Server 2005 Analysis Services](http://go.microsoft.com/fwlink/?LinkId=134599) (<http://go.microsoft.com/fwlink/?LinkId=134599>) Provides information about available MDX query troubleshooting tools. The article also demonstrates how to use the most common of these tools to identify and resolve MDX query performance bottlenecks with individual MDX queries.
- [Analysis Services Processing Best Practices](#) Provides best practices for processing in SQL Server 2005 Analysis Services.
- [OLAP Design Best Practices for Analysis Services 2005](http://go.microsoft.com/fwlink/?LinkId=134600) (<http://go.microsoft.com/fwlink/?LinkId=134600>) Outlines recommended best practices for designing OLAP databases in SQL Server 2005 Analysis Services to better meet the functional and performance needs of users.
- [Microsoft SQL Server 2005 Analysis Services Performance Guide](http://go.microsoft.com/fwlink/?LinkId=134602) (<http://go.microsoft.com/fwlink/?LinkId=134602>) Describes how application developers can apply performance-tuning techniques to their Microsoft SQL Server 2005 Analysis Services Online Analytical Processing (OLAP) solutions.
- [Scale-Out Querying with Analysis Services](http://go.microsoft.com/fwlink/?LinkId=134603) (<http://go.microsoft.com/fwlink/?LinkId=134603>) Describes how to set up a load-balanced scalable querying environment for Microsoft SQL Server 2005 Analysis Services so that you can handle a large number of concurrent queries to your Analysis Services servers. Load-balanced querying ensures that readers of OLAP cubes can consistently query for the latest aggregations throughout the day and distribute the load of all queries among the available servers. This scale-out querying architecture optimizes cube processing time, increases the frequency of cube update, and makes processing more robust because you can afford more frequent processing and transparent error recovery.

Configure Excel Services (Monitoring Server)

In Microsoft Office, you can publish an Excel workbook to Excel Services, which enables the workbook to be a data source for a PerformancePoint Dashboard Designer. This section explains how Excel Services must be configured in Microsoft Office SharePoint Server 2007. To learn more about planning Excel Services security, see [Plan Excel Services security](#) (<http://go.microsoft.com/fwlink/?LinkId=108752&clcid=0x409>). To learn more about how to create an Excel Services report in Dashboard Designer, see [Create an Excel Services report by using PerformancePoint Dashboard Designer](#) (<http://office.microsoft.com/en-us/performancepoint/HA102524991033.aspx>).



Note:

Excel 2007 will not work as a data source if PerformancePoint Dashboard Designer is installed on a 64-bit operating system.

Three settings must be configured for Excel Services to enable your users to publish a workbook.

Setting	Description
Excel Services unattended service account	<p>A low-permissions account that Excel Calculation Services can impersonate when establishing a data connection. The account uses single sign-on (SSO) credentials from an environment that is not Windows-based, or None, as the authentication method. None is another authentication method for Excel Services deployment.</p> <p> Note: This setting is a requirement only for servers that do not have Kerberos enabled. If you have Kerberos enabled, you can skip this setting and proceed to "Excel Services Trusted File Locations."</p>
Excel Services Trusted File Locations	<p>Determines who can act as an author for workbooks that are available under Excel Services. The trusted locations can be designated as SharePoint locations, UNC paths, or HTTP paths. Excel Services loads workbooks only from directory paths that the administrator designates.</p>
Excel Services Trusted Data Connection Libraries	<p>SharePoint document libraries that contain Office data connection (.odc) files. The .odc files are</p>

Setting	Description
	used to centrally manage connections to external data sources.

This article gives procedures for configuring Excel Services.

Procedures

▶ Configure the settings for the Excel Services unattended service account

1. Click **Start**, point to **Administrative Tools**, and then click **SharePoint 3.0 Central Administration**.
2. On the Central Administration home page, click **Shared Services Administration**.
3. On the Manage this Farm's Shared Services page, click **SharedServices1 (Default)**. This is the Shared Services Provider (SSP) that you will configure.
4. On the Shared Services Administration page, click **Edit Excel Services Settings** under Excel Services Settings.
5. Next to **External Data**, enter the Unattended Service account information. Type the same domain and user name that you used to configure the Single Sign-On service. Make sure that you use an account that has limited Write permissions.

▶ Add a trusted file location

1. Click **Start**, point to **Administrative Tools**, and then click **SharePoint 3.0 Central Administration**.
2. On the Central Administration home page, click **Application Management**.
3. On the Application Management page, in the **Office SharePoint Server 2007 Shared Services section**, click **Create or Configure this Farm's Shared Services**.
4. On the Manage this Farm's Shared Services page, click **SharedServices1 (Default)**. This is the Shared Services Provider (SSP) that you will configure.
5. On the Shared Services home page, in the **Excel Services Settings** section, click **Trusted file locations**.
6. On the Excel Services Trusted File Locations page, click **Add Trusted File Location**.
7. In the **Address** section, type the location and name of the SharePoint Office SharePoint Server 2007 document library that you want to add as a trusted file location in Excel Services. If the document library is stored in the Microsoft Windows SharePoint Services 3.0 content database, ensure that Windows SharePoint Services 3.0 is selected as the **Location Type**.
8. In the **External Data** section, select the type of data connections that you will allow workbooks in this trusted file location to contain and click **OK**.

▶ **Add a trusted data connection library**

1. Click **Start**, point to **Administrative Tools**, and then click **SharePoint 3.0 Central Administration**.
2. From the **Administrative Tools**, open the SharePoint Central Administration Web application.
3. On the Central Administration home page, click **Application Management**.
4. On the Application Management page, in the **Office SharePoint Server 2007 Shared Services** section, click **Create or Configure this Farm's Shared Services**.
5. On the Manage this Farm's Shared Services page, click **SharedServices1 (Default)**. This is the Shared Services Provider (SSP) that you will configure.
6. On the Shared Services home page, in the **Excel Services Settings** section, click **Trusted data connection libraries**.
7. On the Excel Services Trusted Data Connection Libraries page, click **Add Trusted Data Connection Library**.
8. Type the address of the data connection library that you want to configure as a trusted data connection library and click **OK**.

See Also

[Create an Excel Services report by using PerformancePoint Dashboard Designer](http://office.microsoft.com/en-us/performancepoint/HA102524991033.aspx)
(<http://office.microsoft.com/en-us/performancepoint/HA102524991033.aspx>)

Strategy maps through Microsoft Office Visio

Dashboard Designer allows you to use strategy maps generated by Microsoft Office Visio to graphically visualize a measured strategy as a flow chart or a diagram. Along with a scorecard, a strategy map makes it easy to see and understand relationships and dependencies between key performance indicators (KPIs), goals, and objectives.

System requirements

Monitoring Server supports two methods for rendering the Visio file, and each method has different requirements on the Monitoring Server computer and client computers.

The first method involves rendering the Visio file as an image. This method requires Visio to be running on the Monitoring Server computer, and the application pool identity account the Web server is running has to have rights to launch Visio 2007. In addition, the application pool account must have write access to create the file. You need to configure the Monitoring Server account so that it is running as a domain user, and you need to register that user with the Microsoft Office system. On the computer that hosts the PerformancePoint Monitoring Server database, you can use the PerformancePoint Monitoring Server Configuration Manager to make these settings.

For Office SharePoint Portal Server, it is more complicated. The first step is to change the actual identity. Note that this changes the identity for all of the SharePoint sites in the application pool, not just for Monitoring Server. You can change the identity by using the SharePoint Central Administration Web site. In addition, you must add the identity account to the appropriate roles in Microsoft SQL Server and to the IIS_WPG group on the Monitoring Server computer.

Once the identity is set up, all you should need to do is load Visio at least once as that same domain user on the Monitoring Server computer. This step should add the appropriate rights and registry entries.

The second method for rendering the Visio file is to show the Visio file in a dashboard. This method has no server requirements, but the client computers must have Visio 2007 or Visio Viewer 2007 installed. Visio Viewer is installed by default when installing Office 2007, or you can download it from the Microsoft Download Center.

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Developer and test environments

The development, test, and production process is a consideration in the Monitoring Server topology design.

Dashboard Viewer for SharePoint Services, for example, is the production dashboard viewing environment. The preproduction environment is Dashboard Web Preview. This preview site allows dashboard designers to export dashboards to ASP.NET to preview the dashboards before publishing them to Office SharePoint Server for production use.

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