

**Power View Infrastructure Configuration and Installation: Step-by-Step and Scripts**

SQL Server Technical Article

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**Summary:** This document contains step-by-step instructions for installing and testing the Microsoft Business Intelligence infrastructure based on SQL Server 2012 and SharePoint 2010, focused on SQL Server 2012 Reporting Services with Power View. This document describes how to completely install the following scenarios: a standalone instance of SharePoint and Power View with all required components; a new SharePoint farm with the Power View infrastructure; a server with the Power View infrastructure joined to an existing SharePoint farm; installation on a separate computer of client tools; installation of a tabular instance of Analysis Services on a separate instance; and configuration of single sign-on access for double-hop scenarios with and without Kerberos. Scripts are provided for all/most scenarios.

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# Introduction

Power View is an interactive data exploration and presentation experience that was introduced in SQL Server 2012. To make it easier to correctly install and configure the components required for use of Power View, this paper provides detailed steps and scripts for setting up multiple scenarios, including the following tasks:

* Understanding the hardware and software requirements
* Obtaining required software from download locations
* Installing and configuring the required infrastructure when Power View and its data models are on the same computer
* Installing and configuring the required infrastructure when Power View is on a different computer than its Analysis Services data model
* Installing and configuring a computer used for client access to Power View reports and models
* Installing SharePoint 2010 and Power View in a workgroup
* Configuring single sign-on access for double-hop scenarios with and without Kerberos

Additionally, this paper walks you through a sample scenario that validates the connectivity of the Power View reports to both PowerPivot workbooks and tabular models. (All sample workbooks are available as downloads.) The validation phase tests different combinations of remote and local servers to demonstrate how to configure data access appropriately.

Note: This paper does not discussion migration or upgrade of SharePoint or SQL Server. For more information about upgrading, see these topics in SQL Server Books Online.

<http://msdn.microsoft.com/en-us/library/bb677622.aspx>

<http://msdn.microsoft.com/en-us/library/ms143747.aspx>

# Summary of Scenarios

This paper describes how to set up the infrastructure for using Power View, in the targeted set of scenarios listed below. Click the link for each section to view detailed requirements and set up instructions.

#### Scenario 1: Install the Power View and PowerPivot Infrastructure on New Single Windows Server 2008 R2 Computer that is a Domain Member

The instructions for this scenario walk you through installing SharePoint 2010, SQL Server 2012 PowerPivot for SharePoint, SQL Server 2012 Reporting Services, SQL Server 2012 Database Engine on a single, domain-joined Windows Server 2008 R2 computer, using either the user interface or a combination of unattended setup scripts and PowerShell configuration cmdlets.

This scenario includes the option to install SQL Server 2012 Analysis Services (tabular), SQL Server Data Tools, and SQL Server Management Tools on the same server or on another computer. For instructions on installing client tools on a Windows 7 computer, see [Scenario 5](#_Scenario_5:_Scripted).

You can validate this environment by using the Power View and PowerPivot HelloWorldPicnic Samples for SQL Server 2012. [Instructions for validation](#_Validate_the_Installation) are provided.

[Go to section for Scenario 1](#_Scenario_1:_Install)

#### Scenario 2: Join a New Windows Server 2008 R2 Computer to an Existing SharePoint 2010 Farm that Does Not Include SQL Server 2008 R2 Business Intelligence Components and Add the Power View and PowerPivot Infrastructure to the SharePoint Farm

The instructions for this scenario walk you through joining a new Windows Server 2008 R2 computer to an existing SharePoint 2010 farm that does not have either SQL Server 2008 R2 Reporting Services or SQL Server 2008 R2 PowerPivot for SharePoint. You then add SQL Server 2012 PowerPivot for SharePoint and SQL Server 2012 Reporting Services on this new SharePoint application server, using either the user interface or a combination of unattended setup scripts and PowerShell configuration cmdlets.

**Note**: This scenario assumes that all client components are installed on another computer. For instructions on installing client tools on a Windows 7 computer, see [Scenario 5](#_Scenario_5:_Scripted).

You can validate this environment by using the Power View and PowerPivot HelloWorldPicnic Samples for SQL Server 2012. [Instructions for validation](#_Validate_the_Installation) are provided.

[Go to section for Scenario 2](#_Scenario_2:_Add)

#### Scenario 3: Install a Tabular Instance of Analysis Services on a New Single Windows Server 2008 R2 Computer that is a Domain Member

The instructions for this scenario walk you through installing SQL Server 2012 Analysis Services (tabular) on a single, domain-joined Windows Server 2008 R2 computer, using either the user interface or a combination of unattended setup scripts.

You can validate this environment by using the Power View and PowerPivot HelloWorldPicnic Samples for SQL Server 2012. [Instructions for validation](#_Validate_the_Installation) are provided.

[Go to section for Scenario 3](#_Scenario_3:_Add)

#### Scenario 4: Install the Power View Infrastructure without PowerPivot on a Single Windows Server 2008 R2 Computer that is a Workgroup Member

In this scenario, a short set of high-level instructions walk you through the installation of SharePoint 2010, SQL Server 2010 Reporting Services, SQL Server Data Tools, SQL Server Management Tools, Office 2010, and PowerPivot for Excel on a single Windows Server 2008 R2 computer that is a member of a workgroup.

Although typically you will use Power View in SharePoint within a domain, the utility of this scenario is that you can set up an environment for trying out Power View without the complexity of working with domain accounts. For example, you could set up SharePoint and Power View on a non-domain-joined laptop for use in demos, or for prototyping new models away from the network. The chief limitation of this scenario is that you cannot use PowerPivot for SharePoint; however, you can create Power View reports using a model hosted in Analysis Services as the data source.

For this scenario, only [high-level instructions for validation](#_Validate_the_Installation) are provided. We recommend that you follow the steps to test scenarios 1 and 2. Just skip the section that creates reports from the PowerPivot model, and instead import the model from PowerPivot for Excel into Analysis Services, and then create reports using Power View against the models in Analysis Services.

[Go to section for Scenario 4](#_Scenario_4:_Install)

#### Scenario 5: Installation of Client Tools on a Windows 7 Computer

In this scenario, a short set of high-level instructions walk you through the installation of Office 2010, PowerPivot for Excel, Report Builder 3.0, SharePoint Designer, SQL Server Data Tools, and SQL Server Management Tools on a Windows 7 computer. This is the sort of client computer that you would typically use to connect to SharePoint and create reports.

Thereafter, a complete set of instructions walk you through testing the Power View and PowerPivot infrastructure using both a local tabular instance and a remote tabular instance, with and without Kerberos.

[Go to section for Scenario 5](#_Scenario_5:_Scripted)

#### Validation Walkthrough

In this walkthrough, you will use sample PowerPivot workbooks, as well as Analysis Services tabular models based on those workbooks, to test that the infrastructure for Power View has been configured successfully. The scenarios tested are 1 and 3 (in which the client connects to a single computer hosting both Power View and the AS instance), and scenarios 2 and 3 (the client connects to SharePoint farm with a remote instance of Analysis Services).

The scenarios used in this walkthrough demonstrate how to accomplish single sign-on in a multiple hop scenario, with and without Kerberos. The walkthrough also demonstrates the differences when opening Power View reports against data models on the same server, and on a different server, and compares the use of Report Data Source (RSDS) vs. a BISM connection.

[Go to section for Validation](#_Validate_the_Installation)

#### Appendix: Configure Kerberos

This section provides technical information on how to configure Kerberos for the described scenarios.

[Go to Appendix](#_Scenario_6:_Configuring)

# References

This section lists the required software and provides links to the recommended documentation and download sites. For some scenarios, we offer an abbreviated and consolidated list of requirements for specific scenarios (such as basic hardware requirements for a multi-machine farm in Scenario 2), but please refer to the official hardware and software requirements listed below before deploying your solution in a production environment.

## Hardware and Software Requirements

* Hardware and software requirements (SharePoint Server 2010): <http://technet.microsoft.com/en-us/library/cc262485.aspx>
* Hardware and Software Requirements for Installing SQL Server 2012: <http://technet.microsoft.com/en-us/library/ms143506.aspx>
* Hardware and Software Requirements (PowerPivot for SharePoint and Reporting Services in SharePoint Mode): <http://technet.microsoft.com/en-us/library/ee210640.aspx>
* Guidance for Using SQL Server BI Features in a SharePoint Farm: <http://msdn.microsoft.com/en-us/library/hh231680.aspx>
* Features Supported by the Editions of SQL Server 2012: <http://technet.microsoft.com/en-us/library/cc645993.aspx>

## Software Required and Download Locations

* SharePoint 2010, Enterprise or Evaluation Edition
  + Download the Evaluation Edition: <http://technet.microsoft.com/en-us/evalcenter/ee388573.aspx>
  + Get an evaluation product key: <http://technet.microsoft.com/en-us/evalcenter/ee391660>
  + Download the appropriate edition of SharePoint 2010 Service Pack 1: <http://support.microsoft.com/kb/2510766>
* SQL Server 2012, Enterprise Edition, Developer Edition, Standard Edition, or Evaluation Edition
  + Download the Evaluation Edition: <http://www.microsoft.com/en-us/download/details.aspx?id=29066>
* Microsoft® SQL Server® 2012 Reporting Services Add-in for Microsoft® SharePoint® Technologies 2010: <http://www.microsoft.com/en-us/download/details.aspx?id=29068&WT.mc_id=rss_alldownloads_all>
* Office 2010, Evaluation Edition
  + Download a 60-day free trial version: <http://office.microsoft.com/en-us/try>
* Visual Studio 2010 Tool for Office Runtime: <http://www.microsoft.com/en-us/download/details.aspx?displaylang=en&id=20479>
* Microsoft .NET Framework 4
  + Download using the standalone Installer: <http://www.microsoft.com/en-us/download/details.aspx?displaylang=en&id=17718>
* PowerPivot for Excel: <http://www.microsoft.com/en-us/download/details.aspx?id=29074>

## Sample Files for Validation

* Power View and PowerPivot HelloWorldPicnic Samples for SQL Server 2012: <http://www.microsoft.com/en-us/download/details.aspx?id=26718>
* Image Files for HelloWorldPicnic Sample Model in PowerPivot and Power View: <http://www.microsoft.com/en-us/download/details.aspx?id=26719>
* AdventureWorks samples: [http://msftdbprodsamples.codeplex.com/releases/view/55330#](http://msftdbprodsamples.codeplex.com/releases/view/55330)
  + AdventureWorksDW2012 Data File: <http://msftdbprodsamples.codeplex.com/releases/view/55330#DownloadId=165405>
  + AdventureWorks Tabular Model SQL Server 2012: <http://msftdbprodsamples.codeplex.com/releases/view/55330#DownloadId=353143>
  + AdventureWorks Internet Sales Tabular Model SQL Server 2012: <http://msftdbprodsamples.codeplex.com/releases/view/55330#DownloadId=353144>

# Scenario 1: Install a SharePoint 2010 Farm, Add the Power View and PowerPivot Infrastructure, and an Analysis Services Tabular Instance

The instructions for this scenario walk you through installing SharePoint 2010, SQL Server 2012 PowerPivot for SharePoint, SQL Server 2012 Reporting Services, and SQL Server 2012 Database Engine on a single, domain-joined Windows Server 2008 R2 computer, using either the user interface or a combination of unattended setup scripts and PowerShell configuration cmdlets.

This scenario includes the option to install SQL Server 2012 Analysis Services (tabular), SQL Server Data Tools, and SQL Server Management Tools on the same computer or on another server. If you install Analysis Services (tabular) on another computer, this scenario includes configuring connectivity from the client computer, through Power View to a remote Analysis Services tabular instance with and without Kerberos.

## Environment, Hardware, and Software Requirements

This scenario uses the following computers and user or service accounts. The names shown in **bold italic** are used throughout the scripts and examples in these instructions. If you use different domain names, computer names or account names, be sure to edit the scripts that are provided.

### Existing Environment

***DC***: An existing domain controller running Windows Server 2008 R2. The domain controller must be configured with the following service and user accounts.

* ***BI\BIService*** - Use this domain account for all SQL Server services and all SharePoint services.

**Note**: You need to expressly give the account BIService (the account for the PowerPivot service) **read** permissions on the tables in the PowerPivot content database in order for the PowerPivot Management Dashboard to process data into its tabular model – otherwise, you will get an error complaining about the lack of Select permissions.

* ***BI\BIAdmin*** - Use this account to manage the SharePoint farm and the SQL Server databases. Add this account to the local administrators group on ***SP1***.
* ***BI\PwrPvtUnattend*** – Use this account for refreshing PowerPivot data from data sources.

**Note**: Although this account is not used specifically in these scenarios, it is part of the PowerPivot configuration process, and so you should have the account created and ready to use during setup.

**Note:** You will note that these scenarios do not include a non-admin user. This is by design. In general, we recommend that you use a limited number of accounts to perform the initial setup. After you have verified that all services work, you can modify your environment with additional identities for various services, as desired. However, using multiple service accounts for various services and using a different service account for SharePoint 2010 services and for SQL Server services substantially complicates your environment – you will need to ensure each new identity has sufficient rights / permissions to accomplish its tasks. Documenting the required steps for multiple service accounts is beyond the scope of this document.

***SP1***: An existing server running with Windows 2008 R2 Service Pack 1 , which has been joined to the domain. Windows Server 2008 R2, Enterprise Edition Service Pack 1 and all applicable updates for Windows and other products from Microsoft Update must have already been installed. The server should meet the following minimum hardware specifications:

* 64-bit operating system,
* 4-core processor
* 8 GB memory
* 100 GB storage

### Required Server Software

* **SQL Server Software**:
  + SQL Server 2012—Enterprise Edition, Developer Edition, Standard Edition, or Evaluation Edition
  + Reporting Services Add-in For Microsoft SharePoint Technologies 2010
* **SharePoint Software**:
  + SharePoint 2010—Enterprise Edition or Evaluation Edition
  + SharePoint 2010 Service Pack 1 (or more recent)

### Optional Server Software

* **SQL Server Software**
  + SQL Server 2012 Cumulative Update 2 (or more recent)

**Important**: After applying a SQL Server 2012 cumulative update to the Microsoft SharePoint 2010 SQL Server 2012 business intelligence infrastructure containing PowerPivot for SharePoint, you must rerun the PowerPivot Configuration Tool.

* **SharePoint Software**
  + SharePoint 2010 Cumulative Update 1 (or more recent)

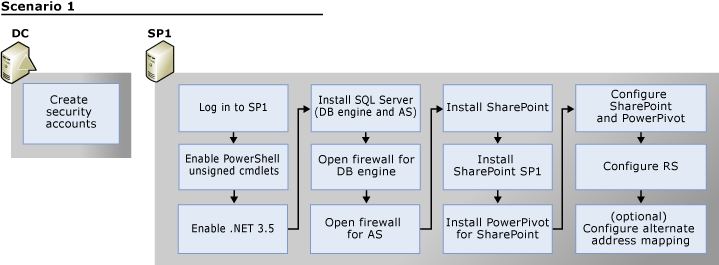
## Scenario 1 Detailed Steps

In this section, you will ensure that the server is configured with the following prerequisites:

* Enable PowerShell cmdlets, which are required for successive scripts.
* Enable the required version of the .NET framework.

You will then install all required software, and register and configure the services.

The diagram provides an overview of the steps, which are described in detail in the following procedures.



### Log in to SP1

* Log in to the SharePoint server named ***SP1*** using the account ***BI/BIAdmin***. (Substitute a different account here if needed.)

### Enable Execution of PowerShell Unsigned cmdlets

1. Open a PowerShell command prompt as Administrator.
2. At the command prompt, type the following command and press **Enter**.

Set-ExecutionPolicy Unrestricted

1. Press **Enter** to accept the default of *Yes*.
2. Leave open this PowerShell command prompt.

### Enable the .NET 3.5 SP1 Framework

The .NET Framework 3.5 Framework with Service Pack 1 must be installed to use the SharePoint server as an application server. You can install the framework using the scripts provided, or by using the user interface in Server Manager.

#### Using scripts

* At the administrative PowerShell prompt, execute the following cmdlet:

Import-Module Servermanager

Add-WindowsFeature Application-Server -restart

#### Using the user interface

1. In Windows Server 2008 R2, click **Start**, point to **Administrative Tools**, and then click **Server Manager**.
2. Right-click **Roles** and then click **Add Roles**.
3. Click **Next**, and then click **Application Server**.
4. Click **Add Required Features**, click **Next**, click **Next** again, click **Next** again, and then click **Install**.
5. When complete, click **Close** and then close **Server Manager**.

### Install SQL Server 2012

You can install the Enterprise, Business Intelligence, Developer or Evaluation Edition of SQL Server 2012. Instructions are provided for installation using the provided scripts, or by using the user interface.

#### Using scripts

1. At the administrative command prompt, change to the folder containing your SQL Server 2012 binaries.
2. Execute the following command. Be sure to replace the arguments in boldface with the appropriate values for your environment.

SETUP.EXE /Q /IACCEPTSQLSERVERLICENSETERMS /ACTION=install /Features=SQLENGINE,AS,RS\_SHP,RS\_SHPWFE,BIDS,CONN,SSMS,ADV\_SSMS /INSTANCENAME=MSSQLSERVER /AGTSVCACCOUNT="**BI\BISERVICE**" /SQLSVCACCOUNT="**BI\BISERVICE**" /ASSVCACCOUNT="**BI\BISERVICE**" /ASSERVERMODE=TABULAR /AGTSVCPASSWORD="**pass@word1**" /SQLSVCPASSWORD="**pass@word1**" /ASSVCPASSWORD="**pass@word1**" /SQLSYSADMINACCOUNTS="**BI\BIAdmin**" /ASSYSADMINACCOUNTS="**BI\BIAdmin**" /PID **xxx-xxxx-xxxx**

**Note**: The parameter */PID* is not required if you are installing the Evaluation edition. Also, it will not be required if it is contained in the DefaultSetup.ini file in the x86 or x64 folder. Otherwise, replace x's with your license key.

**Optional**: If you do not wish to install Analysis Services (tabular) on this computer, use the command-line syntax above, but remove the following arguments:

AS

/ASSVCACCOUNT="BI\BISERVICE"

/ASSERVERMODE=TABULAR

/ASSVCPASSWORD="pass@word1"

/ASSYSADMINACCOUNTS="BI\BIAdmin"

See [Scenario 3](#_Scenario_3:_Install) for the steps to install Analysis Services (tabular) on a dedicated Analysis Services server.

**Tip**: If you do not want to install SQL Server client tools, remove the following arguments:

BIDS

SSMS

ADV\_SSMS

#### Using the user interface

1. Start the installation of SQL Server 2012 from your installation media.
2. On the **SQL Server Installation Center** page, click **Installation** in the navigation pane and then click **New SQL Server stand-alone installation or add features to an existing installation**.
3. On the **Setup Support Rules** page, click **Show Details** (optional step), and then click **OK**.
4. On the **Product Key** page, specify **Evaluation** edition or enter the product key for appropriate edition and then click **Next**.
5. On the **License Terms** page, select the checkbox, **I accept the license terms** , and then click **Next**.
6. On the **Install Setup Files** page, the setup files are installed and the *Setup Support Rules* page opens.
7. On the **Setup Support Rules** page, review the output after the setup rules have run, and then click **Next**.

Ignore the firewall warning for now; the warning does not apply in this scenario, and we will discuss this in [Scenario 2](#_Open_Firewall_Port).

1. On the**Setup Role** page, verify that **SQL Server Feature Installation** is selected and then click **Next**.
2. On the **Feature Selection** page, select the following services and then click **Next**:
   * Database Engine Services
   * Analysis Services
   * Reporting Services - SharePoint
   * Reporting Services Add-in for SharePoint Products
   * Client Tools Connectivity
   * SQL Server Data Tools
   * Management Tools - Basic
   * Management Tools - Complete)
3. On the **Installation Rules** page, click **Next**.
4. On the **Instance Configuration** page, verify that **Default instance** is selected and then click **Next**.
5. On the **Disk Space Requirements** page, click **Next**.
6. On the**Server Configuration** page, set the account name for these services as follows:
   * SQL Server Agent — BI\BIService
   * SQL Server Database Engine — BI \BIService
   * SQL Server Analysis Services — BI\BIService
7. Type the appropriate password for the account and then click **Next**.
8. On the **Database Engine Configuration** page, click **Add Current User** to specify the current user as a SQL Server administrator, and then click **Next**.
9. On the **Analysis Services Configuration** page, select **Tabular Mode**.
10. On the **Analysis Services Configuration** page, click **Add Current User** to specify the current user as an Analysis Services administrator, and then click **Next**.
11. On the **Reporting Services Configuration** page, notice that **Install only** is the only choice, and then click **Next**.
12. On the **Error Reporting** page, click **Next**.
13. On the**Installation Configuration Rules** page, click **Next**.
14. On the **Ready to Install** page, click **Install**.
15. When setup completes, verify that each feature installed successfully and then click **Close**.
16. Close the **SQL Server Installation Center** page.

**Note**: Restart your computer if prompted to do so.

### Open Firewall Port for Connectivity to SQL Server Relational Engine

You need to open the firewall to enable you to connect to the SQL Server relational engine using SQL Server Management Studio on the Windows 7 client computer. For more information about setting up client tools, see Scenario 5.

#### Using scripts

• At an administrative command prompt, execute the following command.

netsh advfirewall firewall add rule name="SQL-1433" dir=in action=allow protocol=TCP localport=1433

#### Using the user interface

1. In the **Administrative Tools** group, click **Windows Firewall with Advanced Security**.
2. In the navigation pane on the left, click **Inbound Rules**.
3. In the **Actions** pane on the right, click **New Rule**.
4. On the **Rule Type** page, click Port and click **Next**.
5. On the **Protocols and Ports** page, type *1433* in the text box for **Specific local ports**, and then click **Next**.
6. On the **Action** page, verify that **Allow the connection** is selected, and then click **Next**.
7. On the **Profile** page, verify that all checkboxes are selected and then click **Next**.
8. On the **Name** page, type *SQL-1433* in the **Name** box and then click **Finish**.
9. Close the **Windows Firewall with Advanced Security** dialog box.

### Open Firewall Port for Connectivity to SQL Server Analysis Services

You need to open the firewall to enable you to connect to the Analysis Services tabular models either by using SQL Server Management Studio or SQL Server Data Tools on the Windows 7 client computer. For more information about setting up client tools, see Scenario 5.

#### Using scripts

• At an administrative command prompt, execute the following command.

netsh advfirewall firewall add rule name="SQL-2383" dir=in action=allow protocol=TCP localport=2383

#### Using the user interface

1. In the **Administrative Tools** group, click **Windows Firewall with Advanced Security**.
2. In the navigation pane on the left, click **Inbound Rules**.
3. In the **Actions** pane on the right, click **New Rule**.
4. On the **Rule Type** page, click Port and click **Next**.
5. On the **Protocols and Ports** page, type *2383* in the text box for **Specific local ports**, and then click **Next**.
6. On the **Action** page, verify that **Allow the connection** is selected, and then click **Next**.
7. On the **Profile** page, verify that all checkboxes are selected and then click **Next**.
8. On the **Name** page, type *SQL-2383* in the **Name** box and then click **Finish**.
9. Close the **Windows Firewall with Advanced Security** dialog box.

### Install SharePoint 2010

This section describes how to install SharePoint 2010. You can install either the Enterprise or Evaluation Edition.

If needed, extract the binaries from the SharePointServer.exe (or OfficeServer.exe)file by executing the following command from a command prompt:

SharePointServer.exe /extract:c:\SharePoint2010

Be sure to change the destination folder as appropriate for your environment.

#### Using scripts

1. At the administrative command prompt, change to the folder containing your SharePoint 2010 binaries and execute the following command.

PrerequisiteInstaller.exe /unattended

**Important:** When the prerequisites have been installed, run this command a second time. When installing the prerequisite files using the unattended switch, often you might need to run this script twice to completely install all of the prerequisite files. There is no harm in running it twice.

1. Copy the config.xml file from the .\Files\SetupFarmSilent folder within the SharePoint 2010 binaries to a folder called InstallScripts.
2. Modify the xml file by adding your PID where indicated in the file or use the config.xml in the InstallScripts folder.

**Tip**: The PID for the Enterprise Edition trial is VK7BD-VBKWR-6FHD9-Q3HM9-6PKMX

1. At the administrative command prompt, change to the folder containing your SharePoint 2010 binaries and execute the following command:

cmd /c setup.exe /config c:\installscripts\config.xml

**Note**: If PrerequisiteInstaller.exe did not install all prerequisites on the first pass, the unattended execution of setup will simply fail. Rerun PrerequisiteInstaller.exe if this occurs.

#### Using the user interface

1. To install the SharePoint prerequisites, double-click *SharePointServer.exe* (or OfficeServer.exe) and then click **Install software prerequisites** in the Microsoft SharePoint Server 2010 wizard after extraction completes. For extracted binaries, double-click *PrerequisiteInstaller.exe* in the SharePoint binary files, and click **Yes**.
2. On the **Welcome to the Microsoft SharePoint 2010 Products Preparation Tool** page, click **Next**.
3. On the **License Terms for Software Products** page, select the checkbox, **I accept the terms of License Agreement(s)**, and then click **Next**.
4. On the **Installation Complete** page, click **Finish** when the installation of the prerequisites is complete.
5. Click **Install SharePoint Server** in the Microsoft SharePoint Server 2010 wizard. If you are using extracted binaries, double-click *Setup.exe* in the SharePoint binary files, and click **Yes**.

**Note**: Occasionally, you will have to run the PrerequisiteInstaller.exe a second time, if not all prerequisites are installed on the first pass.

1. On the **Enter your Product Key** page, enter your product key and click **Continue**.
2. On the **Read the Microsoft Software License Terms** page, select the checkbox, **I accept the terms of this agreement**, and then click **Continue**.
3. On the **Choose the installation you want** page, click **Server Farm**.
4. On the **Server Type** page, verify that the installation type is **Complete** is selected and then click **Install Now**.
5. After the binaries are installed (10-15 minutes), the **Run Configuration Wizard** page appears.
6. Clear the **Run the SharePoint Products Configuration Wizard now** checkbox and click **Close**.

**Note**: For this installation, we are going to let Power Pivot configure SharePoint.

### Install SharePoint 2010 Service Pack 1 and cumulative updates

SharePoint Service Pack 1 is required for PowerPivot and Power View because it enables SharePoint to create a database in a SQL Server 2012 instance without using the system stored procedure, sp\_dboption. This functionality was discontinued in SQL Server 2012 – for more information, see <http://msdn.microsoft.com/en-us/library/ms144262.aspx>.

After you install Service Pack1, we recommend that you install the most recent cumulative update (CU). CU releases include fixes and optimizations to late-breaking problems. After installing any CU, it might be necessary to re-run the Power Pivot configuration tool, to ensure that no service names or settings have been changed. For more information, see <http://technet.microsoft.com/en-US/office/ee748587.aspx>.

This section provides an installation script, as well as instructions for installing the service pack using the installer.

#### Using scripts

1. Open an administrative command prompt, and change to the folder containing the SharePoint 2010 Service Pack 1 files.
2. Execute the following command (the name of your file for SharePoint 2010 SP1 may vary).

cmd /c officeserver2010sp1-kb2460045-x64-fullfile-en-us.exe /quiet

#### Using the user interface

1. Double-click the compressed SharePoint 2010 Service Pack 1 installation file to install Service Pack 1.
2. Click **Yes** when prompted.
3. Select the **Click here to accept the Microsoft Software License Terms** checkbox and then click **Continue**.
4. When complete, click **OK**.

**Note**: Restart your computer if prompted to do so.

### Install SQL Server 2012 PowerPivot for SharePoint

In this section, you will install PowerPivot into the SharePoint server that you just created, but not configure it. You can use either the script that is provided, or the user interface in the SQL Server installer.

#### Using scripts

1. Open an administrative command prompt, and change to the folder containing the SQL Server 2012 binaries.
2. Execute the following command, replacing the arguments in boldface with the appropriate values for your environment:

SETUP.EXE /Q /IACCEPTSQLSERVERLICENSETERMS /ACTION=install /ROLE=SPI\_AS\_ExistingFarm /INSTANCENAME=POWERPIVOT /ASSVCACCOUNT="**BI\BISERVICE**" /ASSVCPASSWORD="**pass@word1**" /ASSYSADMINACCOUNTS="**BI\BIAdmin**" /PID **xxx-xxxx-xxxx**

**Note**: The parameter */PID* is not required if you are installing the evaluation edition. Also, it will not be required if it is contained in the DefaultSetup.ini file in the x86 or x64 folder. Otherwise, replace the x's with your license key. Also, note that the value for INSTANCENAME, POWERPIVOT, is hard-coded and should not be changed.

#### Using the user interface

1. Start the installation of SQL Server 2012 from your installation media.
2. On the **SQL Server Installation Center** page, click **Installation** in the navigation pane on the left and then click **New SQL Server stand-alone installation or add features to an existing installation**.
3. On the **Setup Support Rules** page, click **OK**.
4. On the **Product Updates** page, install any updates found online, and then click **Next**.
5. On the **Install Setup Files** page, the setup files are installed and the *Setup Support Rules* page opens.
6. On the **Setup Support Rules** page, review the output after the setup rules have run, and then click **Next**.
7. On the **Installation Type** page, verify that **Perform a new installation of SQL Server 2012** is selected, and then click **Next**.
8. On the **Product Key** page, specify **Evaluation** edition or enter the product key for the appropriate edition, and then click **Next**.
9. On the **License Terms** page, select the checkbox, **I accept the license terms**, and then click **Next**.
10. On the**Setup Role** page, select **SQL Server PowerPivot for SharePoint**.
11. On the**Setup Role** page, clear the **Add SQL Server Database Relational Engine Services to this installation** checkbox and then click **Next**.
12. On the **Feature Selection** page, click **Next**.
13. On the**Installation Rules** page, click **Next**.
14. On the**Instance Configuration** page, click **Next**.
15. On the **Disk Requirements** page, click **Next**.
16. On the **Server Configuration** page, for **SQL Server Analysis Services** service, enter the account, *BI\BIService*, and type the appropriate password, and then click **Next**.
17. On the **Analysis Services Configuration** page, click **Add Current User** to specify the current user as an Analysis Services administrator, and then click **Next**.
18. On the **Error Reporting** page, click **Next**.
19. On the **Installation Configuration Rules** page, click **Next**.
20. On the **Ready to Install** page, click **Install**.
21. When setup completes, verify that each feature installed successfully and then click **Close**.
22. Close the **SQL Server Installation Center** page.

### Configure SharePoint and PowerPivot

This section describes how to configure the SharePoint server and the PowerPivot services that you just installed.

#### Using scripts

1. Open a PowerShell administrative command prompt.
2. Execute the following command to create the SharePoint farm. Note that the block of code represents a single command.

**Note**: Be sure to replace the parameters in bold with values that are appropriate for your environment.

& "**C:\Program Files\Common Files\Microsoft Shared\Web Server Extensions\14\BIN**\psconfig.exe" -cmd **configdb** -create -server '**SP1**' -database '**SharePoint\_Config\_DB**' -user '**BI\BIService**' -password 'pass@word1' -passphrase '**pass@word1**' -admincontentdatabase '**SharePoint\_Admin\_DB**' -cmd helpcollections -installall -cmd secureresources -cmd services -install -cmd installfeatures -cmd adminvs -provision -port **11111** -windowsauthprovider onlyusentlm -cmd applicationcontent -install -cmd quiet

1. Open a new SharePoint 2010 Management Shell administrative command prompt.

**Tip**: Doing so forces PowerShell to query the state of the farm, detecting the changes you just made.)

1. Execute the following commands, in order, to add PowerPivot solution packages to SharePoint, import the PowerPivot for SharePoint cmdlets, and then deploy the PowerPivot solution to the SharePoint farm for PowerPivot. Be sure to replace the arguments in bold with values appropriate for your environment.

Import-Module **'C:\Program Files\Microsoft SQL Server\110\Tools\PowerPivotTools\ConfigurationTool\Resources**\ConfigurePowerPivot.ps1'

Add-SPSolution -LiteralPath **'C:\Program Files\Microsoft SQL Server\110\Tools\PowerPivotTools\ConfigurationTool\Resources**\PowerPivotFarm.wsp'

Add-SPSolution -LiteralPath **'C:\Program Files\Microsoft SQL Server\110\Tools\PowerPivotTools\ConfigurationTool\Resources**\PowerPivotWebApp.wsp'

DeployFarmSolution

DeployWebAppSolutionToCentralAdmin

Install-SPFeature -path PowerPivot

Install-SPFeature -path PowerPivotAdmin

Install-SPFeature -path PowerPivotSite

1. Open a **new** SharePoint 2010 Management Shell administrative command prompt, to register the newly installed components.
2. Execute the following commands (in order) to import the PowerPivot for SharePoint cmdlets and configure the PowerPivot solution in the SharePoint farm. Be sure to change the arguments in bold as needed for your environment.

Import-Module **'C:\Program Files\Microsoft SQL Server\110\Tools\PowerPivotTools\ConfigurationTool\Resources**\ConfigurePowerPivot.ps1'

$password = convertto-securestring "**pass@word1**" -asplaintext -force

SetEngineServiceCredentials **'BI\BIService**' $password; New-PowerPivotEngineServiceInstance -Provision:$true

New-PowerPivotSystemServiceInstance -Provision:$true

New-PowerPivotServiceApplication -ServiceApplicationName **'Default PowerPivot Service Application**' -DatabaseServerName '**SP1**' -DatabaseName '**DefaultPowerPivotServiceApplicationDB**' -AddToDefaultProxyGroup:$true;Set-PowerPivotSystemService -WorkbookUpgradeOnDataRefresh:$**True** -Confirm:$false

CreateWebApplication '**SharePoint - 80**' 'http://**SP1**' 'Default Application Pool' '**BI\BIService**' $password '**SP1**' '**DefaultWebApplicationDB**'

DeployWebAppSolution 'http://**SP1**' **2047**

New-SPSite -Url 'http://**SP1**' -OwnerEmail **'biadmin@yourdomain.com**' -OwnerAlias '**BI\BIService**' -SecondaryOwnerAlias '**BI\BIAdmin**' -Template 'PowerPivot#0' -Name '**PowerPivot Site**'

EnableSiteFeatures 'http://**SP1**' $true

StartService "Microsoft.SharePoint.Administration.Claims.SPWindowsTokenServiceInstance"

StartSecureStoreService

CreateSecureStoreApplicationService '**SP1**' '**Secure Store Service**'

CreateSecureStoreApplicationServiceProxy '**Secure Store Service**' '**Secure Store Proxy**'

UpdateSecureStoreMasterKey '**Secure Store Proxy**' '**pass@word1**'

CreateUnattendedAccountForDataRefresh 'http://**SP1**' 'PowerPivotUnattendedAccount' **'PowerPivot Unattended Account for Data Refresh**' '**BI\PwrPvtUnattend**' $password

StartService "Microsoft.Office.Excel.Server.MossHost.ExcelServerWebServiceInstance"

New-SPExcelServiceApplication -name '**Excel Services Application**' -Default -ApplicationPool '**SharePoint Web Services System**' | Get-SPExcelServiceApplication | Set-SPExcelServiceApplication | iisreset

Set-SPExcelFileLocation -ExternalDataAllowed 2 -WorkbookSizeMax 200 -WarnOnDataRefresh:$false -ExcelServiceApplication '**Excel Services Application**' -identity 'http://'

AddMSOLAP5AsECSTrustedProvider '**Excel Services Application**'

**Note**: These steps are the same as those run by the configuration utility; however, if you save those steps to a script using the Script option, you will find that the saved script omits the saving of the password to a variable (even though the script uses the variable) which must be strongly typed. Moreover, a line return is omitted that is needed. In this script we have added that line return.

#### Using the user interface

1. Click **Start** and then launch the **PowerPivot Configuration Tool** from the *Microsoft SQL Server 2012*, *Configuration Tool* group.
2. Click **Yes** when prompted.
3. In the **PowerPivot Configuration Tool**, click **OK** to configure or repair PowerPivot for SharePoint.
4. The PowerPivot for SharePoint Configuration Tool queries the state of your SharePoint environment.
5. Review the steps identified by the configuration tool to configure or repair PowerPivot for SharePoint.
6. Enter the following information on the default **Parameters** tab, if necessary replacing the arguments with values appropriate to your environment:
   * **Default Account Username:** BI\BIService
   * **Default Account Password**: pass@word1
   * **Database Server**: SP1 (or other SharePoint server name)***.***
   * **Passphrase**: pass@word1
   * **Confirm Passphrase**: pass@word1
   * **SharePoint Central Administration Port**: 11111
7. Click **Create PowerPivot Service Application** and on the **Parameters** tab, select the checkbox, **Upgrade workbooks to enable data refresh**.
8. Click **Create Unattended Account for Data Refresh** and on the **Parameters** tab, enter the following information:
   * **Unattended Account User Name**: BI\PwrPvtUnattend
   * **Unattended Account Password**: pass@word1
9. Click **Validate** and then verify that all of the hazard icons disappear and are replaced by information icons. Review each of the tasks with an information icon, but do not make any changes.
10. After validation succeeds, click **OK**.
11. Click **Run** and then click **Yes** to continue.
12. When the PowerPivot Configuration Tool completes, verify its success, and then click **OK**.
13. Click **Exit** to close the PowerPivot for Configuration Tool.

**Note**: If you get an error complaining about the lack of Select permissions, you might need to expressly give the account BIService (the account for the PowerPivot service) **read** permissions on the tables in the PowerPivot content database. The account needs these permissions in order for the PowerPivot Management Dashboard to process data into its tabular model.

### Register and Configure Reporting Services

This section describes how to configure the Reporting Services service that you installed previously, using either PowerShell scripts or the user interface in SharePoint.

**Note**: In SQL Server 2012, Reporting Services in SharePoint is no longer a Windows Service, but rather is a SharePoint shared service.

#### Using scripts

1. Open a **new** SharePoint 2010 Management Shell administrative command prompt, to ensure that the components you just installed are registered.
2. Execute the following commands, in order, to register into SharePoint the Reporting Services files that were installed as part of the SQL Server installation. Be sure to replace the arguments in bold as needed with values appropriate to your environment.

Install-SPRSService

Install-SPRSServiceProxy

$appPoolName = "**SharePoint Web Services System**"

$serviceAppName = "**Reporting Web Service**"

$serviceAppProxyName = $serviceAppName + " **Proxy**"

$appPool = get-spserviceapplicationpool $appPoolName

$serviceApp = New-SPRSServiceApplication $serviceAppName -applicationpool $appPool

$serviceAppProxy = New-SPRSServiceApplicationProxy -name $serviceAppProxyName -serviceapplication $serviceApp

get-spserviceapplicationproxygroup -default | Add-SPServiceApplicationProxyGroupMember -Member $serviceAppProxy

$serviceApp.ServiceInstances | Start-SPServiceInstance

#### Using the user interface

1. Click **Start**, point to **All Programs**, expand **SharePoint 2010 Products**, and then open the **SharePoint 2010 Management Shell** as Administrator.
2. At the command prompt, type the following command and press Enter to start Reporting Services:

get-spserviceinstance -all |where {$\_.TypeName -like "SQL Server Reporting\*"} | Start-SPServiceInstance

1. Click **Start**, point to **All Programs**, expand **Microsoft SharePoint 2010 Products**, and then click **SharePoint 2010 Central Administration**.
2. Click **Yes** when prompted.
3. Click **Application Management** and then click **Manage Service Applications**.
4. In the SharePoint ribbon, click the **New** button.
5. In the **New** menu, click **SQL Server Reporting Services Service Application**, and then enter the following information. Be sure to replace the highlighted text with the appropriate values for your environment.
   * **Name**: Reporting Services Application 1
   * **Application pool name**: SharePoint Web Services System
   * **Database server** : SP2
   * **Database name**: Reporting Service DB

**Note**: Using descriptive names for service application databases can help you simplify management as SharePoint sites increase in size. Adding a descriptive name is also useful because in SQL Server 2012 you can now have multiple Reporting Services service applications and content databases.

1. In the **Web Application Association** text box, select the checkbox, **SharePoint - 80 (http://sp1)**, to associate the default SharePoint web application with the SQL Server Reporting Services service application you are about to create.
2. Click **OK**.
3. After the SQL Server Reporting Services service application has been created, click OK to close the page, **Create SQL Server Reporting Services Service Application**.

### (Optional) Configure Alternative Address Mapping

Although this step is optional, if you intend to connect to the SharePoint site using fully qualified names, you will find it more convenient to configure alternate address mapping. For an explanation of alternate address mapping, see <http://msdn.microsoft.com/en-us/library/ms771995.aspx>.

1. In SharePoint Central Administration, under **System Settings**, click **Configure alternate access mappings**.
2. On the **Alternate Access Mappings** page, click the link **Edit Public URLs**.
3. Review the **Edit Public Zone URLs** page. Notice that no Alternate Access Mapping Collections have been selected.
4. In the **Alternate Access Mapping Collection** section, click the drop-down option to change from **No Selection** to **Change Alternate Access Mapping Collection**.
5. On the **Select an Alternate Access Mapping Collection** page, select the **Central Administration** link.
6. In the **Public URLs** section, enter the appropriate information for your environment for the Intranet URL (for example, [*http://sp1.bi.thebiguru.com:11111*](http://sp1.bi.thebiguru.com:11111)) and then click **Save**.
7. In the **Alternate Access Mapping Collection** section, click the drop-down option to change from **Central Administrator** to **Change Alternate Access Mapping Collection**.
8. On the Select an **Alternate Access Mapping Collection** page, select the link **SharePoint - 80**.
9. On the **Alternate Access Mappings** page, click the link **Edit Public URLs**.
10. In the **Public URLs** section, enter the appropriate information for your environment for the Intranet URL ([for example, http://sp1.bi.thebiguru.com](file:///C:\Users\Carl\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\BJY41EBB\for%20example,%20http:\sp1.bi.thebiguru.com)) and then click **Save**.

# Scenario 2: Add the Power View and PowerPivot Infrastructure to the SharePoint 2010 Farm

The instructions for this scenario walk you through joining a new Windows Server 2008 R2 computer to an existing SharePoint 2010 Farm that does not have either SQL Server 2008 R2 Reporting Services or SQL Server 2008 R2 PowerPivot for SharePoint installed. You then add SQL Server 2012 PowerPivot for SharePoint and SQL Server 2012 Reporting Services on this new SharePoint application server, using either the user interface or a combination of unattended setup scripts and PowerShell configuration cmdlets.

## Environment, Hardware, and Software Requirements

This scenario uses the following computers and user or service accounts. The names shown in bold italic are used throughout the scripts and examples in these instructions. If you use different domain names, computer names or account names, be sure to edit the scripts that are provided.

### Existing Environment

***DC***: An existing Domain Controller running Windows Server 2008 R2, with the following service and user accounts.

* + **BI\BIService** - Use this domain account for all SQL Server services and all SharePoint services.

**Note**: You need to expressly give the account BIService (the account for the PowerPivot service) **read** permissions on the tables in the PowerPivot content database in order for the PowerPivot Management Dashboard to process data into its tabular model – otherwise, you will get an error complaining about the lack of SELECT permissions.

* + **BI\BIAdmin** - Use this account to manage the SharePoint farm and the SQL Server databases. Add this account to the local administrators group on ***SP1***.
  + **BI\PwrPvtUnattend** – Use this account for refreshing PowerPivot data from data sources.

**Note**: Although this account is not used specifically in these scenarios, it is part of the PowerPivot configuration process, and so you should have the account created and ready to use during setup.

In general, we recommend that you use this limited number of accounts to perform the initial setup. After you have verified that all services work, you can modify your environment with additional identities for various services, as desired. However, using multiple service accounts for various services and using a different service account for SharePoint 2010 services and for SQL Server services substantially complicates your environment – you will need to ensure each new identity has sufficient rights and permissions to accomplish its tasks. Documenting the required steps for multiple service accounts is beyond the scope of this document.

***SP2***: An existing server, already joined to the domain, that is running Windows Server 2008 R2, Enterprise Edition. Service Pack 1 and all applicable updates for Windows and other products from Microsoft Update must have already been installed. This computer will host the SharePoint farm and requires the following hardware, at minimum:

* 64-bit operating system
* 4 core processor
* 4 GB memory
* 100 GB storage

***PWRTPVT2***: An existing server, already joined to the domain, that is running Windows Server 2008 R2, Enterprise Edition. Service Pack 1 and all applicable updates for Windows and other products from Microsoft Update must have already been installed. The server must meet the following minimum hardware specifications.

* 64-bit operating system
* 4 core processor
* 4 GB memory
* 100 GB storage

### Required Server Software

* **SQL Server**:
  + SQL Server 2012—Enterprise Edition, Developer Edition, Standard Edition, or Evaluation Edition
  + Reporting Services Add-in For Microsoft SharePoint Technologies 2010
* **SharePoint**:
  + SharePoint 2010—Enterprise Edition or Evaluation Edition
  + SharePoint 2010 Service Pack 1

### Optional Server Software

* **SQL Server Software**
  + SQL Server 2012 Cumulative Update 2 (or more recent)

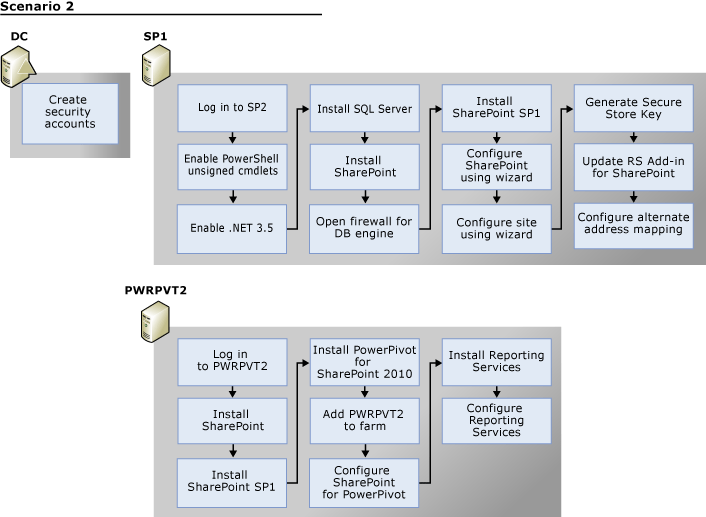
**Important**: After applying a SQL Server 2012 cumulative update to the Microsoft SharePoint 2010 SQL Server 2012 business intelligence infrastructure containing PowerPivot for SharePoint, you must rerun the PowerPivot Configuration Tool

* **SharePoint Software**
  + SharePoint 2010 Cumulative Update 1 (or more recent)

## Scenario 2 Detailed Steps

The diagram provides an overview of the steps, which are described in detail in the following procedures.

This scenario assumes that you will use the data in an Analysis Services tabular instance, which can be either on ***SP1*** or in the standalone instance that you install as part of Scenario 3. Both servers will have SharePoint Service Pack 1 installed. Excel Services will be installed with SharePoint by default on both computers, but it is run from ***SP1***.



### Log in to SP2

* Log in to the SharePoint server (for this scenario, ***SP2***) using the account ***BIAdmin***.

### Enable Execution of PowerShell Unsigned cmdlets

1. Open a PowerShell command prompt as Administrator.
2. At the command prompt, type the following command and press **Enter**.

Set-ExecutionPolicy Unrestricted

1. Press **Enter** to accept the default of *Yes*.
2. Leave open this PowerShell command prompt.

### Enable the .NET 3.5 SP1 Framework

The .NET Framework 3.5 is required for the SharePoint server to act as an application server. You can install this version of the framework by using the standalone installer, or you can use **Server Manager** to add the Application Server role.

#### Using scripts

1. Open a PowerShell command prompt as administrator.
2. Execute the following cmdlet.

Import-Module Servermanager

Add-WindowsFeature Application-Server -restart

#### Using the user interface

1. In Windows Server 2008 R2, click **Start**, point to **Administrative Tools**, and then click **Server Manager**.
2. Right-click **Roles** and then click **Add Roles**.
3. Click **Next**, and then click **Application Server**.
4. Click **Add Required Features**, click **Next**, click **Next** again, click **Next** again, and then click **Install**.
5. When complete, click **Close** and then close **Server Manager**.

### Install SQL Server 2012

In this section, you will install SQL Server 20120, using either a script, or the installer tool. You can install any of the following editions: Enterprise, Business Intelligence, Developer or Evaluation Edition.

For this scenario, you will install the SQL Server database engine locally, for convenience and simplicity. However, you can also install the SQL Server database engine on another server and use that instance to host the SharePoint databases. If you do so, when you run the **SharePoint Products Configuration Wizard**, specify the remote server as the location for the database engine. You also need to open the appropriate port on the firewall on the remote server for the database engine (port 1433 for the default instance) and ensure that the setup user has at least dbcreator or securityadmin permissions in the SQL Server database engine instance. For more information, see Plan administrative tasks in a least-privilege environment (SharePoint Server 2010): <http://technet.microsoft.com/en-us/library/hh377944>.

#### Using scripts

1. At the administrative command prompt, change to the folder containing your SQL Server 2012 binaries.
2. Execute the following command, replacing the text in bold with the appropriate values for your environment.

SETUP.EXE /Q /IACCEPTSQLSERVERLICENSETERMS /ACTION=install /Features=SQL /INSTANCENAME=MSSQLSERVER /AGTSVCACCOUNT="**BI\BISERVICE**" /SQLSVCACCOUNT="**BI\BISERVICE**" /AGTSVCPASSWORD="**pass@word1**" /SQLSVCPASSWORD="**pass@word1**" /SQLSYSADMINACCOUNTS="**BI\BIAdmin**" /PID **xxx-xxxx-xxxx**

**Note**: The PID parameter is not required if you are installing the evaluation edition. Also, it will not be required if it is contained in the DefaultSetup.ini file in the x86 or x64 folder. Otherwise, replace the x's with your license key.

#### Using the user interface

1. Start the installation of SQL Server 2012 from your installation media.
2. On the **SQL Server Installation Center** page, click **Installation** in the navigation pane and then click **New SQL Server stand-alone installation or add features to an existing installation**.
3. On the **Setup Support Rules** page, click **Show Details** (optional step), and then click **OK**.
4. On the **Product Key** page, specify **Evaluation** edition or enter the product key for appropriate edition and then click **Next**.
5. On the **License Terms** page, select the checkbox, **I accept the license terms**, and then click **Next**.
6. On the **Install Setup Files** page, the setup files are installed and the ***Setup Support Rules*** page opens.
7. On the **Setup Support Rules** page, review the output after the setup rules have run, and then click **Next**.

**Note**: You will see a firewall warning bit ignore it for now; we will address it later in this scenario. The default firewall settings will prevent connectivity between the SharePoint computer and the location for its databases as well as to the Analysis Services tabular model.

1. On the**Setup Role** page, verify that **SQL Server Feature Installation** is selected and then click **Next**.
2. On the **Feature Selection** page, select **Database Engine Services** and then click **Next**.
3. On the **Installation Rules** page, click **Next**.
4. On the **Instance Configuration** page, verify that **Default instance** is selected and then click **Next**.
5. On the **Disk Space Requirements** page, click **Next**.
6. On the**Server Configuration** page, change the account used for the following services:
   * **SQL Server Agent:** BI\BIService
   * **SQL Server Database Engine** BI\BIService
7. Enter the appropriate password for each account (in this scenario, p@ssword1), and then click **Next**.
8. On the **Database Engine Configuration** page, click **Add Current User** to specify the current user as a SQL Server administrator.
9. On the **Error Reporting** page, click **Next**.
10. On the**Installation Configuration Rules** page, click **Next**.
11. On the **Ready to Install** page, click **Install**.
12. When setup completes, verify that each feature installed successfully, and then click **Close**.
13. Close the **SQL Server Installation Center** page.

**Note**: If you are prompted to restart your computer, do so.

### Install SharePoint 2010

In this section, you will install either the Enterprise or Evaluation Edition of SharePoint, using either the script provided, or the user interface for installation.

If needed, you can extract the binaries from the SharePointServer.exe (or OfficeServer.exe)file by opening a command prompt, and executing the following command:

SharePointServer.exe /extract:c:\SharePoint2010

Be sure to change the destination location as appropriate for your environment.

#### Using scripts

1. At an administrative command prompt, change to the folder containing your SharePoint 2010 binaries.
2. Execute the following command.

PrerequisiteInstaller.exe /unattended

**Important:** When the prerequisites have been installed, run this command a second time. When installing the prerequisite files using the unattended switch, many times you will need to run this script twice to completely install all of the prerequisite files. Running the script twice does no harm, so you can run it twice just to be sure all components are installed.

1. Copy the config.xml file from the .\Files\SetupFarmSilent folder within the SharePoint 2010 binaries to a folder called InstallScripts.
2. Modify the xml file by adding your PID where indicated in the file, or use the config.xml in the InstallScripts folder.

**Tip**: The PID for the Enterprise Edition trial is VK7BD-VBKWR-6FHD9-Q3HM9-6PKMX

1. In the administrative command prompt, change to the folder containing your SharePoint 2010 binaries and execute the following command.

cmd /c setup.exe /config **c:\installscripts**\config.xml

**Note**: If the PrerequisiteInstaller.exe did not install all prerequisites on the first pass, the unattended execution of setup will fail. If this occurs, rerun PrerequisiteInstaller.exe.

#### Using the user interface

1. To install the SharePoint prerequisites, double-click **SharePointServer.exe** (or OfficeServer.exe)and then click **Install software prerequisites** in the *Microsoft SharePoint Server 2010* wizard after extraction completes or for extracted binaries, double-click **PrerequisiteInstaller.exe** in the SharePoint binary files, and click **Yes**.
2. On the **Welcome to the Microsoft SharePoint 2010 Products Preparation Tool** page, click **Next**.
3. On the **License Terms for Software Products** page, select **the I accept the terms of License Agreement(s)** checkbox, and then click **Next**.
4. On the **Installation Complete** page, click **Finish** when the installation of the prerequisites is complete.
5. Click **Install SharePoint Server** in the *Microsoft SharePoint Server 2010* wizard or for extracted binaries, double-click **Setup.exe** in the SharePoint binary files, and click **Yes**.

**Note**: Occasionally, you will have to run the PrerequisiteInstaller.exe a second time as not all prerequisites are installed on the first pass.

1. On the **Enter your Product Key** page, enter your product key and click **Continue**.
2. On the **Read the Microsoft Software License Terms** page, select the checkbox, **I accept the terms of this agreement**, and then click **Continue**.
3. On the **Choose the installation you want** page, click **Server Farm**.
4. On the **Server****Type** page, verify that **Complete** is selected and then click **Install Now**.
5. After the binaries are installed (10-15 minutes), the **Run Configuration Wizard** page appears.
6. Clear the **Run the SharePoint Products Configuration Wizard now** checkbox and click **Close**.

**Note**: For this installation, we are going to let Power Pivot configure SharePoint.

### Open Firewall Port for Connectivity to SQL Server Database Engine

You need to open the firewall to enable you to connect to the SQL Server relational engine using SQL Server Management Studio on the Windows 7 client computer. For more information about setting up client tools, see Scenario 5.

You can use either the script that is provided or the administration tool for Windows Firewall.

#### Using scripts

* At an administrative command prompt, execute the following command.

netsh advfirewall firewall add rule name="SQL-1433" dir=in action=allow protocol=TCP localport=1433

#### Using the user interface

1. In the **Administrative Tools*****Group***, click **Windows Firewall with Advanced Security**.
2. In the navigation pane on the left, click **Inbound Rules**.
3. In the **Actions** pane on the right, click **New Rule**.
4. On the **Rule Type** page, click **Port** and click **Next**.
5. On the **Protocols and Ports** page, type **1433** in the text box for *Specific local ports*, and then click **Next**.
6. On the **Action** page, verify that **Allow the connection** is selected, and then click **Next**.
7. On the **Profile** page, verify that all checkboxes are selected and then click **Next**.
8. On the **Name** page, type **SQL-1433** in the ***Name*** box and then click **Finish**.
9. Close the **Windows Firewall with Advanced Security** dialog box.

### Install SharePoint 2010 Service Pack 1

SharePoint Service Pack 1 is required for PowerPivot and Power View because it enables SharePoint to create a database in a SQL Server 2012 instance without using the system stored procedure, sp\_dboption. This functionality was discontinued in SQL Server 2012 – for more information, see <http://msdn.microsoft.com/en-us/library/ms144262.aspx>. This section provides an installation script, as well as instructions for installing the service pack using the installer.

#### Using scripts

1. Open an administrative command prompt, and change to the folder containing the SharePoint 2010 Service Pack 1 files.
2. Execute the following command, changing the name of the file for SharePoint 2010 SP1 as required for your environment.

cmd /c officeserver2010sp1-kb2460045-x64-fullfile-en-us.exe /quiet

#### Using the user interface

1. Double-click the compressed SharePoint 2010 Service Pack 1 installation file to install Service Pack 1.
2. Click **Yes** when prompted.
3. Select the checkbox, **Click here to accept the Microsoft Software License Terms**, and then click **Continue**.
4. When complete, click **OK**.

**Note**: If prompted to restart your computer, do so.

### Configure SharePoint using SharePoint Products Configuration Wizard

1. Click **Start**, and then in the *Microsoft SharePoint 2010 Products* group, click **SharePoint 2010 Products Configuration Wizard**.
2. Click **Yes** when prompted.
3. On the **Welcome to SharePoint Products** page, click **Next**.
4. Click **Yes** when notified that certain services may have to be restarted.
5. On the **Connect to a server farm** page, click **Create a new server farm** and then click **Next**.
6. On the **Specify Configuration Database Settings** page, enter the following information (or replace with other values, as appropriate for your environment) and then click **Next**:
   * **Database server**: SP2
   * **Database name**: Accept the default value
   * **Username**: BI\BIService
   * **Password**: pass@word1
7. On the **Specify Farm Security Settings** page, enter a passphrase and click **Next**.

**Important**: You will need this passphrase to add the ***PWRPVT2*** server to this farm.

1. On the **Configure SharePoint Central Administration Web Application** page, accept the dynamic port or specify a specific port number.

**Tip**: Specifying a port number that you can easily remember is useful for remembering the URL to connect to Central Administration, because the default URL is http:// <servername>:port number.

1. On the **Configure SharePoint Central Administration Web Application** page, choose the authentication protocol. For this scenario, accept the default of **NTLM**, and then click **Next**.

**Important**: If you select **Negotiate** (Kerberos), you must configure Kerberos. If you choose **NTLM**, you can change it later and you can use Kerberos for connections from SharePoint to your backend database sources without changing your choice here.

1. On the **Completing the SharePoint Products Configuration Wizard** page, click **Next**.
2. On the **Configuration Successful** page, after SharePoint is configured (10-15 minutes), click **Finish**.

### Configure the SharePoint Site using the Wizard

1. On the **Help Make SharePoint Better** page, make a selection and then click **OK**.
2. On the page, **How do you want to configure your SharePoint farm?**, click **Start the Wizard**.
3. On the **Configure your SharePoint Farm** page, enter the following information and then click Next:

* **Service Account**: Use **Existing account** and select ***BI\BIService***.
* **Services**: Accept the default selections.

1. • On the **Use this page to create a new top-level Web site** page, enter the following information and then click **OK**:

* **Title**: *Scenario 2* (or another title of your choice)
* **URL** : Accept the default setting.
* **Template Selection**: *Team Site*

1. • On the page, **This completes the Farm Configuration Wizard**, click **Finish**.

### Generate the Secure Store Master Key

1. In SharePoint 2010 Central Administration, click **Application Management** and then click **Manage Service Applications**.
2. Click **Secure Store Service** and then click **Generate New Key**.
3. When prompted, enter the value of “**pass@word1**” as the pass phrase for the secure store service and then click **OK**.

### Update the Reporting Services Add-in For Microsoft SharePoint Technologies 2010

In this section, you install the Reporting Services components for SharePoint.

#### Using scripts

1. At the administrative command prompt, change to the folder containing the rsSharePoint.msi file that you downloaded.
2. Execute the following command.

cmd /c rsSharePoint.msi /q

#### Using the user interface

1. Execute the rsSharePoint.msi file that you downloaded.
2. Click **Run** when prompted.
3. Click **Yes** to upgrade.
4. On the page, **Welcome to the Installation Wizard for SQL Server 2012 RS Add-in for SharePoint**, click **Next**.
5. On the **License Agreement** page, select **I accept the terms in the license agreement**, and click **Next**.
6. On the **Ready to Install the Program** page, click **Install**.
7. When prompted to install software on the computer, click **Yes**.
8. When the **User Account Control** dialog box appears, click **Yes**.
9. On the page, **Completing the SQL Server 2012 RS Add-in for SharePoint Installation**, click **Finish**.

### (Optional) Configure Alternative Address Mapping

1. In SharePoint Central Administration, click **Configure alternate access mappings** under **System Settings**.
2. On the **Alternate Access Mappings** page, click on the **Edit Public URLs** link.
3. Review the **Edit Public Zone URLs** page. Notice that no Alternate Access Mapping Collections have been selected.
4. In the **Alternate Access Mapping Collection** section, click the drop-down option to change from **No Selection** to **Change Alternate Access Mapping Collection**.
5. On the page, **Select an Alternate Access Mapping Collection**, select the **Central Administration** link.
6. In the **Public URLs** section, enter the appropriate information for your environment for the Intranet URL (<http://sp2.bi.thebiguru.com:11111>) and then click **Save**.
7. In the **Alternate Access Mapping Collection** section, click the drop-down option to change from **Central Administrator** to **Change Alternate Access Mapping Collection**.
8. On the page, **Select an Alternate Access Mapping Collection**, select the **SharePoint - 80** link.
9. On the **Alternate Access Mappings** page, click on the **Edit Public URLs** link.
10. In the **Public URLs** section, enter the appropriate information for your environment for the Intranet URL (<http://sp2.bi.thebiguru.com>) and then click **Save**.

### Log in to PWRPVT2

* Log in to PWRPVT2 using the account ***BI\BIAdmin***.

### Install SharePoint 2010

In this section, you will install SharePoint 2010 Enterprise or Evaluation Edition.

If needed, extract the binaries from the SharePointServer.exe (or OfficeServer.exe) file by executing the following command from a command prompt. Be sure to change the destination location as appropriate for your environment.

SharePointServer.exe /extract:c:\SharePoint2010

#### Using scripts

1. Open an administrative command prompt, and change to the folder containing your SharePoint 2010 binaries.
2. Execute the following command.

PrerequisiteInstaller.exe /unattended

**Important**: When the prerequisites have been installed, run this command a second time. When installing the prerequisite files using the unattended switch, many times you will need to run this script twice to completely install all of the prerequisite files. Because running the command twice does no harm, you can run it twice just to be sure all components have been installed.

1. Copy the config.xml file from the .\Files\SetupFarmSilent folder within the SharePoint 2010 binaries to a folder called InstallScripts.
2. Modify the xml file by adding your PID where indicated in the file, and make sure you uncomment the PIDKEY Value xml tag before saving the file.

**Tip**: The PID for the Enterprise Edition trial is VK7BD-VBKWR-6FHD9-Q3HM9-6PKMX

1. Open the administrative command prompt, change to the folder containing your SharePoint 2010 binaries and execute the following command.

cmd /c setup.exe /config c:\installscripts\config.xml

**Note**: If the PrerequisiteInstaller.exe did not install all prerequisites are installed on the first pass, the unattended execution of setup will simply fail. Rerun PrerequisiteInstaller.exe if this occurs.

#### Using the user interface

To install the SharePoint prerequisites, double-click SharePointServer.exe (or OfficeServer.exe) and then click Install software prerequisites in the Microsoft SharePoint Server 2010 wizard after extraction completes or for extracted binaries, double-click PrerequisiteInstaller.exe in the SharePoint binary files, and click **Yes**.

1. On the page, **Welcome to the Microsoft SharePoint 2010 Products Preparation Tool**, click **Next**.
2. On the page, **License Terms for Software Products**, select the checkbox, **I accept the terms of License Agreement(s)**, and then click **Next**.
3. On the **Installation Complete** page, click **Finish** when the installation of the prerequisites is complete.
4. Click **Install SharePoint Server in the Microsoft SharePoint Server 2010** wizard. Or, for extracted binaries, double-click Setup.exe in the SharePoint binary files, and click **Yes**.

**Note**: Occasionally, you will have to run the PrerequisiteInstaller.exe a second time if not all prerequisites are installed on the first pass.

1. On the **Enter your Product Key** page, enter your product key and click **Continue**.
2. On the Read the Microsoft Software License Terms page, select the checkbox, **I accept the terms of this agreement**, and then click **Continue**.
3. On the page, **Choose the installation you want**, click **Server Farm**.
4. On the **Server Type** page, verify that **Complete** is selected, and then click **Install Now**.
5. After the binaries are installed (10-15 minutes), the **Run Configuration Wizard** page appears.
6. Clear the checkbox for **Run the SharePoint Products Configuration Wizard now** and click **Close**. For this installation, we are going to let Power Pivot configure SharePoint.

### Install SharePoint 2010 Service Pack 1

SharePoint Service Pack 1 is required for PowerPivot and Power View because it enables SharePoint to create a database in a SQL Server 2012 instance without using the system stored procedure, sp\_dboption. This functionality was discontinued in SQL Server 2012 – for more information, see http://msdn.microsoft.com/en-us/library/ms144262.aspx . This section provides an installation script, as well as instructions for installing the service pack using the installer.

#### Using scripts

1. At the administrative command prompt, change to the folder containing the SharePoint 2010 Service Pack 1 files,
2. Execute the following command (the name of your file for SharePoint 2010 SP1 may vary).

cmd /c officeserver2010sp1-kb2460045-x64-fullfile-en-us.exe /quiet

#### Using the user interface

1. Double-click the compressed SharePoint 2010 Service Pack 1 installation file to install Service Pack 1.
2. Click **Yes** when prompted.
3. Select the checkbox, **Click here to accept the Microsoft Software License Terms**, and then click **Continue**.
4. When complete, click **OK**.

**Note**: If prompted to restart your computer, do so.

### Install SQL Server 2012 PowerPivot for SharePoint

In this section, you will install (but not configure) the PowerPivot components required for SharePoint. You can install these either by using a script, or by using the SQL Server installer.

#### Using scripts

1. At the administrative command prompt, change to the folder containing your SQL Server 2012 binaries
2. Execute the following command (replacing the arguments in bold with the appropriate values for your environment:

SETUP.EXE /Q /IACCEPTSQLSERVERLICENSETERMS /ACTION=install /ROLE=SPI\_AS\_ExistingFarm /INSTANCENAME=POWERPIVOT /ASSVCACCOUNT="**BI\BISERVICE**" /ASSVCPASSWORD="**pass@word1**" /ASSYSADMINACCOUNTS="**BI\BIAdmin**" /PID **xxx-xxxx-xxxx**

**Note**: The PID parameter is not required if you are installing the evaluation edition. Also, it will not be required if it is contained in the DefaultSetup.ini file in the x86 or x64 folder. Otherwise, replace the x's with your license key.

#### Using the user interface

1. Start the installation of SQL Server 2012 from your installation media.
2. On the SQL Server Installation Center page, click **Installation** in the navigation pane and then click **New SQL Server stand-alone installation or add features to an existing installation**.
3. On the **Setup Support Rules** page, click **Show Details** (optional step), and then click **OK**.
4. On the **Product Key** page, specify **Evaluation** edition or enter the product key for appropriate edition and then click **Next**.
5. On the **License Terms** page, select the checkbox, **I accept the license terms** checkbox, and then click **Next**.
6. On the **Install Setup Files** page, the setup files are installed and the **Setup Support Rules** page opens.
7. On the **Setup Support Rules** page, review the output after the setup rules have run, and then click **Next**.

**Note**: Note the firewall warning, which we will address later in this scenario. The default firewall settings will prevent connectivity between the SharePoint computer and the location for its databases.

1. On the **Installation Type** page, verify that **Perform a new installation of SQL Server 2012** is selected, and then click **Next**.
2. On the**Setup Role** page, select **SQL Server PowerPivot for SharePoint**.
3. On the**Setup Role** page, clear the checkbox, **Add SQL Server Database Relational Engine Services to this installation** and then click **Next**.
4. On the **Feature Selection** page, click **Next**. Analysis Services is selected by default.
5. On the **Installation Rules** page, click **Next**.
6. On the **Instance Configuration** page, click **Next**.
7. On the **Disk Space Requirements** page, click **Next**.
8. On the**Server Configuration** page, enter the account,**BIService**, and type the appropriate password for SQL Server Analysis Services service, and then click **Next**.
9. On the **Analysis Services Configuration page**, select **Tabular Mode**.
10. On the **Analysis Services Configuration** page, click **Add Current User** to specify the current user as an Analysis Services administrator, and then click **Next**.
11. On the **Error Reporting** page, click **Next**.
12. On the**Installation Configuration Rules** page, click **Next**.
13. On the **Ready to Install** page, click **Install**.
14. When setup completes, verify that each feature installed successfully and then click **Close**.
15. Close the **SQL Server Installation Center**.

**Note**: If you are prompted to restart your computer, do so.

### Add PWRPVT2 to the SharePoint Farm

In this section, you will use either scripts or the management interface of SharePojnt to add the server ***PWRPVT2*** to the SharePoint farm as a new application server.

#### Using scripts

1. Open an administrative SharePoint 2010 Management Shell PowerShell command prompt.
2. Execute the following commands in order, changing the arguments in bold as appropriate for your environment:

Connect-SPConfigurationDatabase -DatabaseServer "**SP2**" -DatabaseName "SharePoint\_Config" -Passphrase (ConvertTo-SecureString "**pass@word1**" -AsPlainText -Force)

Install-SPHelpCollection -All

Initialize-SPResourceSecurity

Install-SPService

Install-SPFeature -AllExistingFeatures

Install-SPApplicationContent

Get-SPFarm | select Servers

1. Close and reopen the SharePoint 2010 Management Shell PowerShell command prompt to verify that you can now connect to the SharePoint farm.

#### Using the user interface

1. Click **Start** and then, from the **Microsoft SharePoint 2010 Products** group, click **SharePoint 2010 Products Configuration Wizard**.
2. On the **Welcome the SharePoint Products** page, click **Next**.
3. Click **Yes** when notified that certain services may have to be restarted.
4. On the **Connect to a server farm** page, verify that **Connect to an existing server farm** is selected and then click **Next**.
5. On the **Specify Configuration Database Settings** page, enter the Database server name (in this scenario, it would be ***SP2***) in the Database server text box and click **Retrieve Database Names**.
6. After the Database name for the SharePoint\_config database is retrieved successfully, click **Next**.
7. On the **Specify Farm Security Settings** page, enter the passphrase for the SharePoint farm in the passphrase text box, and then click **Next**.
8. On the **Completing the SharePoint Products Configuration Wizard** page, review the configuration settings and then click **Advanced Settings**.
9. On the **Advanced Settings** page, verify that this new SharePoint farm application server will not host the web site and then click **OK**.
10. On the **Completing the SharePoint Products Configuration Wizard** page, click **Next**.
11. On the **Configuration Successful** page, after the SharePoint products are configured, click **Finish**.
12. On the page, **How do you want to configure this SharePoint server?**, click **Cancel**. We will use the PowerPivot Configuration Tool to configure this application server.

### Configure SharePoint and PowerPivot

In this section, you will use scripts or the SharePoint management interface to add PowerPivot solution packages to SharePoint, import the PowerPivot for SharePoint cmdlets and then deploy the PowerPivot solution to the SharePoint farm for PowerPivot.

#### Using scripts

1. Open a SharePoint 2010 Management Shell administrative command prompt.
2. Execute the following commands, in order, replacing the arguments in bold with values appropriate to your environment:

Net Start SPTimerV4

Add-SPSolution -LiteralPath **'C:\Program Files\Microsoft SQL Server\110\Tools\PowerPivotTools\ConfigurationTool\Resources**\PowerPivotFarm.wsp'

Add-SPSolution -LiteralPath **'C:\Program Files\Microsoft SQL Server\110\Tools\PowerPivotTools\ConfigurationTool\Resources**\PowerPivotWebApp.wsp'

Import-Module **'C:\Program Files\Microsoft SQL Server\110\Tools\PowerPivotTools\ConfigurationTool\Resources**\ConfigurePowerPivot.ps1'

DeployFarmSolution

DeployWebAppSolutionToCentralAdmin

Install-SPFeature -path PowerPivot

Install-SPFeature -path PowerPivotAdmin

Install-SPFeature -path PowerPivotSite

1. Open a **new** SharePoint 2010 Management Shell administrative command prompt, to ensure that the components you installed are registered.
2. Execute the following commands, in order, replacing the argument sin bold with values appropriate for your environment:

Import-Module **'C:\Program Files\Microsoft SQL Server\110\Tools\PowerPivotTools\ConfigurationTool\Resources**\ConfigurePowerPivot.ps1'

$password = convertto-securestring "**pass@word1**" -asplaintext -force

SetEngineServiceCredentials **'BI\BIService**' $password; New-PowerPivotEngineServiceInstance -Provision:$true

New-PowerPivotSystemServiceInstance -Provision:$true

New-PowerPivotServiceApplication -ServiceApplicationName **'Default PowerPivot Service Application**' -DatabaseServerName '**SP2**' -DatabaseName '**DefaultPowerPivotServiceApplicationDB**' -AddToDefaultProxyGroup:$true;Set-PowerPivotSystemService -WorkbookUpgradeOnDataRefresh:$**True** -Confirm:$false

DeployWebAppSolution 'http://**SP2**' **2047**

EnableSiteFeatures 'http://**SP2**' $true

StartService "Microsoft.SharePoint.Administration.Claims.SPWindowsTokenServiceInstance"

CreateUnattendedAccountForDataRefresh 'http://**SP2**' 'PowerPivotUnattendedAccount' '**PowerPivot Unattended Account for Data Refresh**' '**BI\PwrPvtUnattend**' $password

AddMSOLAP5AsECSTrustedProvider 'Excel Services Application'

#### Using the user interface

1. Click **Start** and then launch the PowerPivot Configuration Tool from the Microsoft SQL Server 2012, Configuration Tool group.
2. Click **Yes** when prompted.
3. In the PowerPivot Configuration Tool, click **OK** to configure or repair PowerPivot for SharePoint.
4. The PowerPivot for SharePoint Configuration Tool queries the state of your SharePoint environment. It detects the existing farm and determines which of the SharePoint components required by PowerPivot for SharePoint are already installed.
5. Review the steps identified by the configuration tool to configure or repair PowerPivot for SharePoint.
6. Enter the following information on the default **Parameters** tab, replacing the arguments with the appropriate values for your environment:

* **Default Account Username**: BI\BIService
* **Default Account Password**: pass@word1
* **Database Server**: SP2Passphrase: pass@word1
* **Confirm Passphrase**: pass@word1

1. Click **Create PowerPivot Service Application** and on the **Parameters** tab, select the checkbox, **Upgrade workbooks to enable data refresh**.
2. Click **Create Unattended Account for Data Refresh** and on the **Parameters** tab, enter the following information, replacing the arguments with values appropriate for your environment:

* **Unattended Account User Name**: BI\PwrPvtUnattend
* **Unattended Account Password**: pass@word1

1. Click **Validate** and then verify that all of the hazard icons disappear and are replaced by information icons. Review each of the tasks with an information icon, but do not make any changes.
2. After validation succeeds, click **OK**.
3. Click **Run** and then click **Yes** to continue.
4. When the PowerPivot Configuration Tool completes, verify its success, and then click **OK**.
5. Click **Exit** to close the PowerPivot Configuration Tool.

**Note**: The account ***BIService*** (the account for the PowerPivot service) requires **read** permissions on the tables in the PowerPivot content database in order for the PowerPivot Management Dashboard to process data into its tabular model. If you get an error complaining about the lack of SELECT permissions, you need to expressly give these permissions.

### Install SQL Server 2012 Reporting Services

In this section, you will install components of Reporting Services that are needed for SharePoint.

Technically, all that isrequired is the Reporting Services Add-In for SharePoint Products on the server hosted the SharePoint web site. However, the SQL Server 2008 R2 Add-in is installed as part of the SharePoint 2010 prerequisites, and we recommend that you upgrade this component as well, in case you choose to use this server as a Web front end server in the future.

#### Using scripts

1. At the administrative command prompt, change to the folder containing the SQL Server 2012 binaries
2. Execute the following command, replacing the arguments in bold with the appropriate values for your environment:

SETUP.EXE /Q /IACCEPTSQLSERVERLICENSETERMS /ACTION=install /Features= RS\_SHP,RS\_SHPWFE /INSTANCENAME=MSSQLSERVER /RSSHPINSTALLMODE=SharePointFilesOnlyMode /PID **xxx-xxxx-xxxx text**

**Note**: The parameter */PID* is not required if you are installing the evaluation edition. Also, it will not be required if it is contained in the DefaultSetup.ini file in the x86 or x64 folder. Otherwise, replace the x's with your license key.

#### Using the user interface

1. Start the installation of SQL Server 2012 from your installation media.
2. On the **SQL Server Installation Center** page, click **Installation** in the navigation pane and then click **New SQL Server stand-alone installation or add features to an existing installation**.
3. On the **Setup Support Rules** page, click **OK**.
4. On the **Product Updates** page, install any updates found online, and then click **Next**.
5. On the **Install Setup Files** page, the setup files are installed and the **Setup Support Rules** page opens.
6. On the **Setup Support Rules** page, review the output after the setup rules have run, and then click **Next**.
7. On the **Installation Type** page, verify that **Perform a new installation of SQL Server 2012** is selected, and then click **Next**.
8. On the **Product Key** page, specify **Evaluation edition** or enter the product key for the appropriate edition and then click **Next**.
9. On the **License Terms** page, select the checkbox, **I accept the license terms**, and then click **Next**.
10. On the **Setup Role** page, verify that **SQL Server Feature Installation** is selected and then click **Next**.
11. On the **Feature Selection** page, select **Reporting Services - SharePoint and Reporting Services Add-In for SharePoint Products**, and then click **Next**.
12. On the **Disk Space Requirements** page, click **Next**.
13. On the **Reporting Services Configuration** page, notice that **Install only** is the only choice, and then click **Next**.
14. On the **Error Reporting** page, click Next.
15. On the **Installation Configuration Rules** page, click **Next**.
16. On the **Ready to Install** page, click **Install**.
17. When setup completes, verify that each feature installed successfully and then click Close.
18. Close the **SQL Server Installation Center** page.

**Note**: If you are prompted to restart your computer, do so.

### Configure Reporting Services

In this section, you will use either scripts or the SharePoint management interface to register into SharePoint the Reporting Services files that were installed as part of the SQL Server installation.

#### Using scripts

1. Open a new SharePoint 2010 Management Shell administrative command prompt, to ensure that the components you just installed are registered.
2. Execute the following commands, in order, replacing the arguments in bold with the appropriate values for your environment.

$appPoolName = "**SharePoint Web Services System**"

$serviceAppName = "**Reporting Web Service**"

$serviceAppProxyName = $serviceAppName + " **Proxy**"

$appPool = get-spserviceapplicationpool $appPoolName

$serviceApp = New-SPRSServiceApplication $serviceAppName -applicationpool $appPool

$serviceAppProxy = New-SPRSServiceApplicationProxy -name $serviceAppProxyName -serviceapplication $serviceApp

get-spserviceapplicationproxygroup -default | Add-SPServiceApplicationProxyGroupMember -Member $serviceAppProxy

$serviceApp.ServiceInstances | Start-SPServiceInstance

#### Using the user interface

1. Click **Start**, point to **All Programs**, expand **Microsoft SharePoint 2010 Products**, and then click **SharePoint 2010 Central Administration**.
2. Click **Yes** when prompted.
3. Click **Application Management** and then click **Manage Service Applications**.
4. In the SharePoint ribbon, click the **New** button.
5. In the **New** menu, click **SQL Server Reporting Services Service Application** and then enter the following information, replacing the arguments with appropriate values for your environment:

* **Name**: Reporting Web Service
* **Application pool name**: SharePoint Web Services System
* **Database server**: SP2
* **Database name**: Reporting Service DB

**Note**: Using descriptive names for service application databases is a good idea because it simplifies management, as SharePoint sites increase in size. Also, in SharePoint 2010 you can have multiple Reporting Services service applications and content databases.

1. In the **Web Application Association** text box, select the **SharePoint - 80 (http://sp2)** checkbox to associate the default SharePoint web application with the SQL Server Reporting Services service application that you are about to create.
2. Click **OK**.
3. After the SQL Server Reporting Services service application is created, click **OK** to close the **Create SQL Server Reporting Services Service Application** page.

# Scenario 3: Install an Analysis Services Tabular Instance

The instructions for this scenario walk you through installing SQL Server 2012 Analysis Services (tabular) on a single, domain-joined Windows Server 2008 R2 computer, using either the user interface or a combination of unattended setup scripts.

This scenario moves you closer towards a real-world solution in which a dedicated server hosts your analytical models, which users can access by using the Power View reports and data connections provided in the SharePoint farm.

[Scenario 5](#_Validate_and_Test) provides instructions for how you can verify the Power View and PowerPivot environment using client tools that connect to this tabular instance.

## Environment, Hardware, and Software Requirements

This scenario uses the following computers and user or service accounts. If you use different computer names or different accounts, be sure to edit the scripts that are provided.

### Existing Environment

***DC***: An existing domain controller running Windows Server 2008 R2 (called DC in this scenario) with the following service and user accounts (replacing the highlighted text with the appropriate values for your environment):

* + **BI\BIService -** Use this domain account for all SQL Server services and all SharePoint services.

**Note**: You need to expressly give the account BIService (the account for the PowerPivot service) read permissions on the tables in the PowerPivot content database in order for the PowerPivot Management Dashboard to process data into its tabular model – otherwise, you will get an error complaining about the lack of Select permissions.

* + **BI\BIAdmin -** Use this account to manage the SharePoint farm and the SQL Server databases. Add this account to the local administrators group on ***DS3***.
  + **BI\PwrPvtUnattend –** Use this account for refreshing PowerPivot data from data sources.

**Note**: Although this account is not used specifically in these scenarios, it is part of the PowerPivot configuration process, and so you should have the account created and ready to use during setup.

***DS3***: An existing member server running Windows Server 2008 R2, Enterprise Edition with Service Pack 1 and all applicable updates for Windows and other products from Microsoft Update and meeting the following minimum hardware specifications

* + 64-bit operating systems
  + 4 core processor
  + 4 GB memory
  + 100 GB storage

### Required Server Software

* **SQL Server Software**:
  + SQL Server 2012—Enterprise Edition, Developer Edition, Standard Edition, or Evaluation Edition
  + Reporting Services Add-in For Microsoft SharePoint Technologies 2010
* **SharePoint Software**:
  + SharePoint 2010—Enterprise Edition or Evaluation Edition
  + SharePoint 2010 Service Pack 1

### Optional Server Software

* **SQL Server Software**
  + SQL Server 2012 Cumulative Update 2 (or more recent)

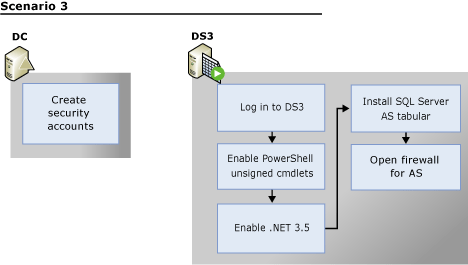
**Important**: After applying a SQL Server 2012 cumulative update to the Microsoft SharePoint 2010 SQL Server 2012 business intelligence infrastructure containing PowerPivot for SharePoint, you must rerun the PowerPivot Configuration Tool.

* **SharePoint Software**
  + SharePoint 2010 Cumulative Update 1 (or more recent)

**Note**: This scenario does not require updates that are intended to support the Office 2013 release, and you should not install them. For more information about updates specifically for the next version of office, see http://msdn.microsoft.com/en-us/library/jj219067.aspx.

## Scenario 3 Detailed Steps

The diagram provides an overview of the steps, which are described in detail in the following procedures.



### Log in to DS3

* Log on to DS3 using the account ***BIAdmin***.

### Enable Execution of PowerShell Unsigned cmdlets

1. Open a PowerShell command prompt as Administrator.
2. At the command prompt, type the following command and press Enter.

Set-ExecutionPolicy Unrestricted

1. Press Enter to accept the default of **Yes**.
2. Leave open this PowerShell command prompt.

### Enable the .NET 3.5 SP1 Framework

The .NET Framework 3.5 is required for the SharePoint server to act as an application server. You can install this version of the framework by using the standalone installer, or you can use **Server Manager** to add the Application Server role.

#### Using scripts

* At an Administrative PowerShell prompt, execute the following cmdlets.

Import-Module Servermanager

Add-WindowsFeature Application-Server -restart

#### Using the user interface

1. In Windows Server 2008 R2, click **Start**, point to **Administrative Tools**, and then click **Server Manager**.
2. Right-click **Roles** and then click **Add Roles**.
3. Click **Next**, and then click **Application Server**.
4. Click **Add Required Features**, click **Next**, click **Next** again, click **Next** again, and then click **Install**.
5. When complete, click **Close** and then close Server Manager.

### Install SQL Server 2012

In this section you will install an instance of Analysis Services in tabular mode, using either scripts or the SQL Server Installer. You can install any of the following editions: Enterprise, Business Intelligence, Developer or Evaluation Edition.

Note that you will not install the database engine or any of the client tools; for information on setting up a client with these tools, see [Scenario 5](#_Scenario_5:_Scripted).

#### Using scripts

1. Open an administrative command prompt, and change to the folder containing your SQL Server 2012 binaries.
2. Execute the following command, replacing the text in bold with the appropriate values for your environment.

SETUP.EXE /Q /IACCEPTSQLSERVERLICENSETERMS /ACTION=install /Features=AS /INSTANCENAME=MSSQLSERVER /ASSVCACCOUNT="**BI\BISERVICE**" /ASSVCPASSWORD="**pass@word1**" /ASSERVERMODE=TABULAR /ASSYSADMINACCOUNTS="**BI\BIAdmin**" /**PID xxx-xxxx-xxxx**

**Note**: The PID parameter is not required if you are installing the evaluation edition. Also, it will not be required if it is contained in the DefaultSetup.ini file in the x86 or x64 folder. Otherwise, replace the x's with your license key.

#### Using the user interface

1. Start the installation of SQL Server 2012 from your installation media.
2. On the SQL Server Installation Center page, click **Installation** in the navigation pane and then click **New SQL Server stand-alone installation or add features to an existing installation**.
3. On the **Setup Support Rules** page, click **Show Details** (optional step), and then click **OK**.
4. On the **Product Key** page, specify **Evaluation edition** or enter the product key for appropriate edition and then click **Next**.
5. On the **License Terms** page, select the checkbox, **I accept the license terms** , and then click **Next**.
6. On the **Install Setup Files** page, the setup files are installed and the **Setup Support Rules** page opens.
7. On the **Setup Support Rules** page, review the output after the setup rules have run, and then click **Next**.

**Note**: Note the firewall warning. The default firewall settings will prevent connectivity to the SharePoint computer, and will also prevent connections to the Analysis Services tabular model. We will address this warning in this scenario by opening a firewall port.

1. On the **Setup Role** page, verify that **SQL Server Feature Installation** is selected and then click **Next**.
2. On the **Feature Selection** page, select **Analysis Services** and then click **Next**.
3. On the **Installation Rules** page, click **Next**.
4. On the **Instance Configuration** page, verify that **Default instance** is selected and then click **Next**.
5. On the **Disk Space Requirements** page, click **Next**.
6. On the **Server Configuration** page, change the account name for SQL Server Analysis Services to **BI\BIService**, enter the appropriate password, and then click **Next**.
7. On the **Analysis Services Configuration** page, select **Tabular Mode**.
8. On the **Analysis Services Configuration** page, click **Add Current User** to specify the current user as an Analysis Services administrator.
9. On the **Error Reporting** page, click **Next**.
10. On the **Installation Configuration Rules** page, click **Next**.
11. On the **Ready to Install** page, click **Install**.
12. When setup completes, verify that each feature installed successfully and then click **Close**.
13. Close the SQL Server Installation Center page.

**Note**: If you are prompted to restart your computer, do so.

### Open Firewall Port for Connectivity to SQL Server Analysis Services

You need to open the firewall to enable you to connect to the Analysis Services tabular models either by using SQL Server Management Studio or SQL Server Data Tools on the Windows 7 client computer. You also need to open the firewall to enable SQL Server 2012 Reporting Services for SharePoint (Power View) to connect to this remote tabular instance. For more information about setting up client tools, see Scenario 5.

#### Using scripts

* At an administrative command prompt, execute the following command.

netsh advfirewall firewall add rule name="SQL-2383" dir=in action=allow protocol=TCP localport=2383

#### Using the user interface

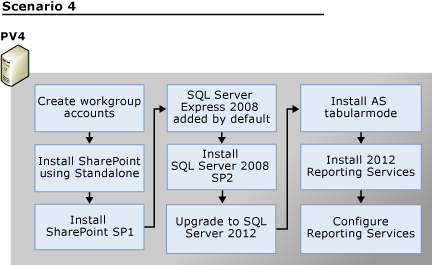
1. In the **Administrative Tools** group, click **Windows Firewall with Advanced Security**.
2. In the navigation pane on the left, click **Inbound Rules**.
3. In the **Actions** pane on the right, click **New Rule**.
4. On the **Rule Type** page, click **Port** and click **Next**.
5. On the **Protocols and Ports** page, type *2383* in the text box for **Specific local ports**, and then click **Next**.
6. On the **Action** page, verify that **Allow the connection** is selected, and then click **Next**.
7. On the **Profile** page, verify that all checkboxes are selected and then click **Next**.
8. On the **Name** page, type *SQL-2383* in the **Name** box and then click **Finish**.
9. Close the **Windows Firewall with Advanced Security** dialog box.

# Scenario 4: Install the Power View Infrastructure (without PowerPivot) on a Single Windows Server 2008 R2 Computer that is a Workgroup Member

The instructions for this scenario provide a high-level checklist for installation of the Power View infrastructure—SharePoint 2010, SQL Server 2012 Analysis Services (tabular), SQL Server 2010 Reporting Services (with Power View), SQL Server Data Tools, SQL Server Management Tools, Office 2010, and PowerPivot for Excel—on a single Windows Server 2008 R2 computer that is a member of a workgroup.

While this is not the typical environment for use of Power View, it is a useful configuration for demo environments on a standalone computer, or for creating a test and prototyping environment on a single computer.

**Important**: PowerPivot for SharePoint is not supported in a non-domain environment. However, you can use Power View on a non-domain-connected computer, if you use an instance of Analysis Services as the model data source.



### Create accounts in the workgroup

* Create the same accounts on the workgroup computer that you did in other scenarios:
  + BIService
  + BIAdmin

### Install SharePoint 2010

* Install SharePoint 2010 prerequisites.
* Install SharePoint 2010. Select **Standalone** rather than **Complete Farm** to enable you to use local user accounts rather than domain accounts. When you choose this option, an instance of SQL Server 2008 Express Edition is automatically installed as well.
* Install SharePoint 2010 Service Pack 1.

### Install SharePoint SP1

* Install SharePoint 2010 Service Pack 1. As usual, it is assumed that the workgroup computer has been fully patched, and Windows Update is turned on.

### Install SQL Server 2008 SP2

* Install SQL Server 2008, Service Pack 2 (or greater).

**Note**: This step is necessary because Power View is not supported on Express Edition and you cannot upgrade from a SQL Server Express Edition to either an Evaluation Edition or a Developer Edition.

**Note**: You can also choose to upgrade the SQL Server 2008 R2 Express Edition to SQL Server 2008 R2 Data Center, Enterprise or Standard Edition.

### Upgrade to SQL Server 2012

* Upgrade to SQL Server 2012, Enterprise, Standard, or Business Intelligence Edition.

**Note**: Power View is not supported on Express Edition or an Evaluation Edition; therefore, you must use one of the listed editions.

### Install Analysis Services

* Install an instance of SQL Server 2012 Analysis Services in tabular mode. You must use one of these editions: Enterprise, Standard, or Business Intelligence Edition.

### Install Reporting Services

* Install SQL Server 2012 Reporting Services using Enterprise, Standard, or Business Intelligence Edition.

**Note**: You cannot use an Evaluation Edition for Power View.

### Configure Reporting Services

* Configure SQL Server 2012 Reporting Services as described [previously](#_Configure_Reporting_Services).

# Scenario 5: Install Client Tools on a Windows 7 Computer and Verify the Power View and PowerPivot Installations

This section provides a short set of high-level instructions that walk you through the installation of Office 2010, PowerPivot for Excel, Report Builder 3.0, SharePoint Designer, SQL Server Data Tools, and SQL Server Management Tools on a Windows 7 computer.

When installation is complete, you can follow another set of instructions to test the Power View and PowerPivot Infrastructure using both a local tabular instance as well as a remote tabular instance, with and without Kerberos.

## Environment, Hardware, and Software Requirements

This scenario uses the following computers and user or service accounts. If you use different computer names or different accounts, be sure to edit the scripts that are provided.

### Existing Environment

***DC***: An existing domain controller running Windows Server 2008 R2 with the following service and user accounts:

* + **BI\BIService -** Use this domain account for all SQL Server services and all SharePoint services.

**Note**: You need to expressly give the account **BIService** (the account for the PowerPivot service) read permissions on the tables in the PowerPivot content database in order for the PowerPivot Management Dashboard to process data into its tabular model – otherwise, you will get an error complaining about the lack of Select permissions.

* + **BI\BIAdmin -** Use this account to manage the SharePoint farm and the SQL Server databases. Add this account to the local administrators group on ***DS3***.
  + **BI\PwrPvtUnattend –** Use this account for refreshing PowerPivot data from data sources.

**Note**: Although this account is not used specifically in these scenarios, it is part of the PowerPivot configuration process, and so you should have the account created and ready to use during setup.

***WIN7CLIENT***: An existing computer running Windows 7, already joined to the domain, and with Service Pack 1 and all applicable updates for Windows and other products from Microsoft Update installed. The client must meet the following minimum hardware specifications:

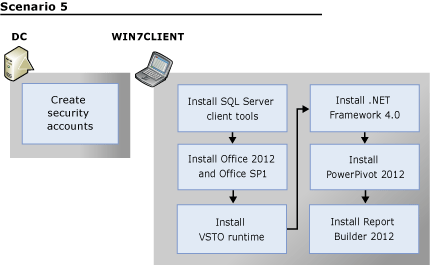
* + 32-bit operating system; 64-bit recommended
  + 2 GB memory
  + 50 GB storage

### Required Software

* **SQL Server Software:** 
  + SQL Server 2012—Enterprise Edition, Developer Edition, Standard Edition, or Evaluation Edition
  + SQL Server 2012 PowerPivot for Excel
    - If you use SQL Server 2012 Cumulative Update 2 or later, use the Cumulative Update 2 or later version of PowerPivot for Excel
  + SQL Server 2012 Report Builder. Note that while Report Builder is not explicitly used in this scenario, it is a valuable tool for this configuration, and should be included as part of setup.
* **Office Software:** 
  + Office 2010—32-bit or 64-bit
  + Office 2010 Service Pack 1
* **Other Software:**
  + Visual Studio 2010 Tool for Office Runtime
  + Microsoft .NET Framework 4 (Standalone Installer)
* **Samples**
  + Power View and PowerPivot HelloWorld Picnic Samples for SQL Server 2012
  + Image Files for HelloWorldPicnic Sample Model in PowerPivot and Power View

## Scenario 5 Detailed Steps

The diagram provides an overview of the steps, which are described in detail in the following procedures.



### Log in to Client Computer

* Log in to the computer, ***WIN7CLIENT***, using the account ***BIAdmin***.

**Note**: You will use this account, rather than a user account with lesser permissions, because the aim of validation is to make sure that all services are installed correctly and components have the necessary connectivity with this minimal level of permissions, You can add other accounts and test more complex security scenarios later.

### Install Client Tools

* Install the following software:
  + SQL Server 2012 Data Tools and SQL Server Management Tools, Basic and Complete
  + Office 2010 (64-bit recommended if you are using the 64-bit edition of Windows 7)
  + Office 2010 Service Pack 1
  + Visual Studio 2010 Tool for Office Runtime
  + Microsoft .NET Framework 4 (Standalone Installer)
  + SQL Server 2012 PowerPivot for Excel 2010
  + SQL Server 2012 Report Builder

# Validate and Test the Scenarios

In this section, you will use the provided sample models to verify that Power View and PowerPivot are both working on the SharePoint sites you created.

You will then verify whether the client computer can connect to SharePoint and create Power View reports, by using the models hosted in PowerPivot.

You will also import these models to the Analysis Services tabular mode instances on ***SP1*** and ***DS3*** and test whether you can create reports based on the tabular models using either of the SharePoint servers, ***SP1*** and ***SP2***.

**Note**: To test the standalone installation created in a workgroup for Scenario 4, you can import the PowerPivot model into the tabular instance on DS3 and create the Power View report in SharePoint. In other words, skip the steps for adding the PowerPivot model to SharePoint and for testing Power View against the PowerPivot model in SharePoint.

## Validate and Test Scenario 1 (all services on one host)

### Connect to SharePoint Web Site for Scenario 1

* Open a browser and type the address of the SharePoint site that you set up in Scenario 1; for example: <http://SP1>

### Add SQL Server 2012 Business Intelligence Content Types to SharePoint Site

1. In the navigation pane, click **Shared Documents**.
2. On the SharePoint ribbon, click **Library** and then click **Library Settings. (**This option might be found under **Settings** if your screen is too narrow).
3. Click **Advanced Settings**.
4. In the **Content Types** section, click **Yes** to allow management of content types and then click **OK** at the bottom of the page.
5. In the **Content Types** section in the middle of the page, click **Add from existing site content types**.
6. Add all of the Business Intelligence and SQL Server Reporting Services Content Types and then click **OK**.

These content types will now appear as new document options in **Shared Documents**.

### Grant Users Permissions to Site

1. Click **Site Actions** and then click **Site Permissions**.
2. Create desired groups (if they do not already exist).
3. Add users to appropriate groups and click **OK**.

**Note**: You can also grant permissions to users directly (which is fine for initial testing), but we recommend that you use groups instead in a production environment, because managing individual user accounts becomes very difficult as the number of users increases.

### Add PowerPivot Model to PowerPivot Gallery

1. In the navigation pane, click **PowerPivot Gallery**. If prompted to install a newer version of Silverlight, do so and then restart your browser to continue.
2. On the SharePoint ribbon, click **Documents**.
3. On the SharePoint ribbon, click **Upload Document**.
4. Browse to the location to which you extracted the *PowerViewPowerPivotHelloWorldPicnicSamples* folder.
5. In this folder, double-click *HelloWorldPicnicPowerViewRTM.Xlsx* and click **OK** to upload these files into SharePoint.

After a few minutes, the images of the pivot tables and the pivot charts in the deployed PowerPivot model are generated.

1. Click the Pivot Chart report for the *HelloWorldPicnicPowerViewRTM* PowerPivot model to open this chart in Excel Services and validate the installation of Excel Services.
2. Switch to the PivotChart sheet and remove the filter for **Color** to validate that PowerPivot is working as expected.
3. Click the **Back** button in Internet Explorer to return to the Gallery.

### Launch Power View Report to Verify that Power View is Working

1. Click **Create Power View Report** in the upper right hand section of the web page for this document.
2. If Power View is configured correctly, a blank report opens.
3. Expand **Items** and select **Type**.
4. Expand **Quantities** and select **Sum of Quantity Consumed**.
5. In the **Visualizations** toolbar, click **Column**.
6. Drag **Serve** from **Items** into **Series**.
7. Expand the bar chart.
8. Click the **Back** button in Internet Explorer and then click **Leave this Page.**

If you want to experiment more with Power View, you can return to the page later and run the full tutorial.

### Add Power View Report to Shared Documents and Update the Data Source Connection

1. In the navigation pane, click **Shared Documents**.
2. Click **Add document**.
3. Browse to the location to which you extracted the PowerViewPowerPivotHelloWorldPicnic samples.
4. Double-click *HelloWorldPicnicReport.rdlx* and click **OK** to upload this report into SharePoint.
5. When prompted, change the report name to *HelloWorldPicnicReport-PowerPivot* and then click **Save**.
6. On the SharePoint ribbon, click **Documents**, click the drop-down list for **New Document**, and then click **Report Data Source**.

**Tip**: This step is important because the report that you uploaded must be updated with a data source configured for your environment before it can work properly.

1. Enter the following information:
   * **Name**: *HelloWorldPowerPivotDataSource*
   * **Data Source Type**: Microsoft BI Semantic Model for Power View
   * **Connection String**: Data Source = Http://SP1/PowerPivot%20Gallery/HelloWorldPicnicPowerViewRTM.xlsx
2. Click **Test Connection**.
3. After the connection tests successfully, click **OK**.
4. Click the drop-down list for the *HelloWorldPicnicReport-PowerPivot* report, and then click **Manage Data Sources**.
5. Click **EntityDataSource**.
6. Click the ellipsis to the right of the text box for **Data Source Link**.
7. Double-click *HelloWorldPowerPivotDataSource*, click **OK**, and then click **Close**.
8. Click *HelloWorldPicnicReport-PowerPivot* to open the saved Power View report with a connection to the PowerPivot model.
9. Click the **Back** button in Internet Explorer.

Now you have verified that the Windows 7 client can connect to the Power View infrastructure with PowerPivot that you installed in the Scenario 1 environment.

## Validate and Test Scenario 2 (services on multiple hosts)

In this section, you will verify that the server you added to the SharePoint farm, ***SP2***, can also be accessed using the PowerPivot and Power View tools on the client, ***WIN7CLIENT***.

We recommend that you use a new tab because you will be returning to the Scenario 1 SharePoint Web site in a few moments.

### Connect to SharePoint Web Site for Scenario 2

* Open a new browser tab and type the address for the Scenario 2 server: for example http://SP2

### Verify that You Can Use Power View and PowerPivot

Repeat the previous procedures to validate that you can use Power View and PowerPivot from ***WIN7CLIENT*** to connect to the server, ***SP2***, you set up in [Scenario 2](#_Scenario_2:_Install).

* Add BI content types to the site.
* Grant users permission to the site.
* Add PowerPivot models to the Gallery.
* Create a Power View report based on the uploaded model.
* Save the Power View report to Shared Documents.

## Create Tabular Models on SP1, SP2, and DS3

In this section, you will import models from PowerPivot into Analysis Services tabular instances, to verify that Power View reports can use these models.

**Note**: If you used different computer names or different accounts for setup, be sure to edit the procedures below as required for your environment.

### SP1: Import Sample Model to Analysis Services Tabular Instance

1. Copy the **HelloWorldPicnicPowerViewRTM.xlsx** PowerPivot model to the following location on **SP1**:

C:\Program Files\Microsoft SQL Server\MSAS11.MSSQLSERVER\OLAP\Backup

1. Open SQL Server Management Studio and connect to Analysis Services on ***SP1***.
2. In Object Explorer, right-click **Databases** and click **Restore from PowerPivot**.
3. In the **Restore from PowerPivot** dialog box, click **Browse** to locate the *HelloWorldPicnicPowerViewRTM PowerPivot* model.
4. In the **Locate Database Files** dialog box, expand C:\Program Files\Microsoft SQL Server\MSAS11.MSSQLSERVER\OLAP\Backup, select HelloWorldPicnicPowerViewRTM.xlsx, and then click **OK**.
5. In the **Restore database** text box, type *HelloWorldPicnicPowerViewRTM* and then click **OK** to import the model to Analysis Services.
6. After the restore completes, expand the **Databases** node to verify that the PowerPivot model has successfully been imported into Analysis Services.

### DS3: Import Sample Model to Dedicated Tabular Instance of Analysis Services

1. Copy the PowerPivot model *in HelloWorldPicnicPowerViewRTM.xlsx*to the following location on ***DS3***:

C:\Program Files\Microsoft SQL Server\MSAS11.MSSQLSERVER\OLAP\Backup

1. Open SQL Server Management Studio and connect to Analysis Services on ***DS3***.
2. In Object Explorer, right-click **Databases** and click **Restore from PowerPivot**.
3. In the **Restore from PowerPivot** dialog box, click **Browse**.
4. In the **Locate Database Files** dialog box, expand C:\Program Files\Microsoft SQL Server\MSAS11.MSSQLSERVER\OLAP\Backup, select *HelloWorldPicnicPowerViewRTM.xlsx*, and then click **OK**.
5. In the **Restore database** text box, type HelloWorldPicnicPowerViewRTM and then click **OK** to import the model from PowerPivot to this tabular instance of Analysis Services.
6. After the restore completes, expand the **Databases** node to verify that the PowerPivot model has successfully been added to the dedicated tabular instance of Analysis Services that was set up on ***DS3***.

## Validate Same-Box Scenario

In this section, you will use Power View to create reports, using a tabular model that is hosted on the same server as Power View. You will compare two different connection types: a report data source (RDS), and a BI Semantic Model (BISM) connection.

### SP1-SP1: Use a Report Data Source Connection for the Power View Report on SP1 with the Analysis Services Tabular Model on SP1

1. Click the tab of your browser that is open to the SharePoint web site for ***SP1*** (http://SP1).
2. Open the **Shared Documents** library and then click **Documents** on the SharePoint ribbon.
3. On the SharePoint ribbon, click the drop-down list for **New Document** and click **Report Data Source**.
4. Enter the following information. Do not change any other settings–we will explore these settings more fully later.

* **Name**: HelloWorldSSASServerDataSource-SP1
* **Data Source Type**: Microsoft BI Semantic Model for Power View
* **Connection String**: Data Source = SP1; Initial Catalog = HelloWorldPicnicPowerViewRTM

1. Click **Test Connection**. After the connection has been established successfully, click **OK**.

**Result**: This test connection is expected to succeed because the SharePoint Reporting Services service application and the Analysis Services data source are on the same computer; that is, no double-hop is involved. We will explore the double-hop issue using ***DS3*** in a few moments.

1. Click **Add Document**.
2. Browse to the location to which you extracted the PowerViewPowerPivotHelloWorldPicnic samples.
3. Double-click *HelloWorldPicnicReport.rdlx* and click **OK** to upload these files into SharePoint.
4. When prompted, change the report name to *HelloWorldPicnicReport-SSASServer-RSDS-SP1* and then click **Save**.
5. Click the drop-down list for the HelloWorldPicnicReport-RSDS-SP1, and then click **Manage Data Sources**.
6. Click **EntityDataSource**.
7. Click the ellipsis to the right of the text box for **Data Source Link**.
8. Select *HelloWorldSSASServerDataSource-SP1*, click **OK**, and then click **Close**.
9. Click *HelloWorldPicnicReport-SSASServer-RSDS-SP1* to open the saved Power View report with a connection to the Analysis Services tabular model on ***SP1***.

**Result**: This report will fail if the user making the connection does not have permission to read the data in the Analysis Services tabular instance.

1. Click the **Back** button in Internet Explorer.

### SP1-SP1: Use a BI Semantic Model Connection on SP1 to Connect a Power View Report to Analysis Services Tabular on SP1

1. On the Scenario 1 SharePoint web site, click **Documents** on the SharePoint ribbon.
2. Click the drop-down list for **New Document** and click **BI Semantic Model Connection**.
3. Enter the following information and click **OK**:
   * **File Name**: HelloWorldSSASServerDataSource-SP1
   * **Workbook URL or Server Name**: SP1
   * **Database**: HelloWorldPicnicPowerViewRTM

**Result**: The Reporting Services application in SharePoint automatically tries to connect to the Analysis Services tabular mode instance when it saves the BI Semantic Model Connection. If a connection cannot be made, due to permissions or other issues, the BISM Connection file will not be saved. However, you will be given the option to save the file anyway or make changes (such as for typos). A valid connection file might fail if the user creating it did not have sufficient permissions in the tabular instance, in which case, you would want to save it anyhow.

1. Click the *HelloWorldSSASServerDataSource-SP1* connection file.

**Result:** If the connection is successful and the user has permissions to the data, a blank Power View report appears with an open connection to the Analysis Services tabular model for the Hello World Picnic database.

1. Click the **Back** button in Internet Explorer.

## Validate Single Sign-On in Double-Hop Scenarios

In this section, you will create two different types of data connections, using scenarios where the tabular data model is on a different computer than Power View, and compare the results when using the two connection types.

### SP1-DS3: Use a Report Data Source Connection on SP1 to Connect a Power View Report to Analysis Services Tabular on DS3

1. On the SharePoint ribbon for the SharePoint web site for ***SP1***, click **Documents**.
2. On the SharePoint ribbon, click the drop-down list for **New Document** and click **Report Data Source**.
3. Enter the following information:
4. **Name**: HelloWorldSSASServerDataSource-DS3
5. **Data Source Type**: Microsoft BI Semantic Model for Power View
6. **Connection String**: Data Source = DS3; Initial Catalog = HelloWorldPicnicPowerViewRTM
7. Click **Test Connection**.

**Result** This connection will fail because the SharePoint Reporting Services service application and the Analysis Services data source are on different computers; in other words, a double-hop is involved.

In this scenario, if you turned on SQL Server Profiler and profiled the Analysis Services instance onDS3, you would discover that the user attempting the connection appears as NT AUTHORITY\ANONYMOUS LOGON.

To verify this, create a trace on the Analysis Services instance on ***DS3*** and look at the **Audit Login** event and the **Discover Begin** event, and add the **Request Properties** column.

To resolve the problem, you have several options:

1. You can embed credentials and have all users connect to the Analysis Services tabular model with the same credentials.
   1. In the dialog box, click **Stored Credentials**.
   2. In the **User Name** text box, enter ***BI\BIService***.
   3. In the **Password** text box, enter the appropriate password (e.g. pass@word1)
   4. Select the **Use as Windows credentials** checkbox.
   5. Click **Test Connection**.

**Result**: The connection succeeds, and all users that connect using this data source would connect to the underlying tabular model with these credentials rather than their own credentials.

1. You can use the **Set Execution Context** option.
2. Select the checkbox, **Set execution context to this account**.
3. Click **Test Connection**.

**Result**: The connection succeeds, because the account ***BI\BIService*** connects on behalf of ***BI\BIAdmin*** using the **EffectiveUserName** property. You can verify this by looking at the **Server State Discover Begin** event in the PropertyList. The connection is successful because the account ***BI\BIService*** is an administrator in the ***DS3*** Analysis Services instance.

1. You can configure Kerberos.

See [Appendix A](#_Appendix:_Configuring_Kerberos) of this document for instructions on how to configure Kerberos for the environment in this document. If you choose to configure Kerberos, you should test with Windows authentication again.

**Important**: After you test without Kerberos, you will need to wait approximately 15 minutes for the Kerberos cache to clear. If you follow the steps in Appendix A to configure Kerberos, it should take you less than 15 minutes. As a result, if you connect immediately after completing Kerberos setup, you might experience another connection failure and see NT AUTHORITY\ANONYMOUS LOGON in your SQL Server Profiler trace. To avoid this, you can either wait, or reboot all servers involved. 

1. Prompt for credentials.

Power View does not support the option to prompt for credentials.

1. After the connection tests successfully, click **OK** to save a working connection.
2. Click **Add Document**.
3. Browse to the location to which you extracted the sample files for *PowerViewPowerPivotHelloWorldPicnicSamples*.
4. Double-click *HelloWorldPicnicReport.rdlx* and click **OK** to upload these files into SharePoint.
5. When prompted, change the report name to *HelloWorldPicnicReport-SSASServer-RSDS-DS3* and then click **Save**.
6. Click the drop-down list for the *HelloWorldPicnicReport-RSDS-DS3*, and then click **Manage Data Sources**.
7. Click **EntityDataSource**.
8. Click the ellipsis to the right of the text box for **Data Source Link**.
9. Select *HelloWorldSSASServerDataSource-DS3*, click **OK**, and then click **Close**.
10. Click *HelloWorldPicnicReport-SSASServer-RSDS-DS3* to open the saved Power View report with a connection to the Analysis Services tabular model on ***DS3***.

**Result**: This report will fail if the user making the connection does not have permission to read the data in the Analysis Services tabular instance.

1. Click the **Back** button in Internet Explorer.

### SP2-DS3: Use a Report Data Source Connection on SP2 to Connect a Power View Report to Analysis Services Tabular on DS3

* Repeat the steps in the previous procedures to validate Scenario 2, this time using the Power View infrastructure on ***SP2*** to connect to the tabular data model on ***DS3***.
  1. Open the ***SP2*** Web site.
  2. Add a new report data source.
  3. Configure the source to use the AS instance on ***DS3****.*
  4. Verify connections.
  5. Open report and verify that data is accessible.

### SP1-DS3: Use a BI Semantic Model Connection on SP1 to Connect a Power View Report to Analysis Services Tabular on DS3

1. Open the SharePoint web site for ***SP1*** (for example, http://SP1), and click **Documents** on the SharePoint ribbon.
2. Click the drop-down list for **New Document** and click **BI Semantic Model Connection**.
3. Enter the following information:
   * **File Name**: HelloWorldSSASServerDataSource-DS3
   * **Workbook URL or Server Name**: DS3
   * **Database**: HelloWorldPicnicPowerViewRTM
4. Click **OK**.

**Result**: If you have previously configured Kerberos, this connection will succeed with Reporting Services using Kerberos to impersonate BI\BIAdmin when querying data from the tabular model in the Analysis Services instance, ***DS3***.

If you have not configured Kerberos, the connect will also succeed – this time because Reporting Services sets the EffectiveUserName property to a value of BI\BIAdmin when it connects as BI\BIService, its identity. This tactic is used automatically, without any configuration, and it succeeds because BI\BIAdmin has permission on the cube. Moreover, the account BI\BIService is the service account for the tabular instance of Analysis Services on ***DS3*** and therefore has sufficient permissions to honor the <EffectiveUserName>. The user making the connection to Analysis Services must be a member of the Server Administrator role in Analysis Services for the <EffectiveUserName> connection string property to be used.

If the service accounts for the tabular models and Reporting Services did not match, you would have to add the identity of the Reporting Services service application to the Server Administrator role in the tabular instance of Analysis Services on ***DS3***.

1. Click the *HelloWorldSSASServerDataSource-DS3* connection file.

**Result**: A blank Power View report appears with an open connection to the Analysis Services tabular model for the Hello World Picnic database. The connection is made by BI\BIService on behalf of the logged in user.

### SP2-DS3: Use a BI Semantic Model Connection on SP2 to Connect a Power View Report to Analysis Services Tabular on DS3

Repeat the steps in the previous procedures to validate Scenario 2, this time using the Power View infrastructure on ***SP2*** to connect to the tabular data model on ***DS3***.

* 1. Open the ***SP2*** Web site.
  2. Add a new BISM connection source.
  3. Configure the BISM connection to use the AS instance on ***DS3****.*
  4. Verify connections.
  5. Open report and verify that data is accessible.

**Result**: A blank Power View report appears with an open connection to the remote Analysis Services tabular model for the Hello World Picnic database. The connection is made by BI\BIService on behalf of the logged in user.

**Important**: Using the <EffectiveUserName> will also work in a multiple domain environment provided domain trusts are in place. Kerberos with constrained delegation, however, will not work across domain boundaries – regardless of trusts.

## Validation Summary

To recap, this section compares the options you tested in this validation walkthrough.

#### Single-Hop Scenarios

The following matrix summarizes the results when the Analysis Services instance hosting the tabular model is on the same computer as the SharePoint document library and Power View.

|  |  |  |  |
| --- | --- | --- | --- |
| **Client computer** | **Tabular data source** | **Data Source Connection Type** | **Results** |
| Power View on SP1 | ***SP1*** | Report Data source | **Test connection**  Works  **Report**  This report will fail if the user making the connection does not have permission to read the data in the Analysis Services database. |
| Power View on SP1 | ***SP1*** | BISM (Microsoft BI Semantic Model for Power View) | **Test connection:**  RS tries to connect to the AS instance when it saves the BISM file. If a connection cannot be made, you will have the option to save the file anyway or make changes.  **Report**  If the connection is successful and the user has permissions to the data, a blank Power View report appears with an open connection to the Analysis Services model. |

In short, when Power View and the Analysis Services model are on the SharePoint server, you can use either RSDS or BISM connections, but you must make sure that users have permissions on the tabular instance.

#### Double-Hop Scenarios

The following matrix summarizes the results in scenarios where the Analysis Services instance hosting the tabular models is on a different computer than SharePoint and Power View.

Recall that SP1 represents the computer hosting the SharePoint farm, whereas SP2 represents a computer that has the Power View infrastructure and was joined to an existing SharePoint farm. The client WIN7CLIENT is used to access Power View, while the data and models used in the Power View reports reside on an independent Analysis Services server, necessitating a double-hop between the client computer to the farm and then from the Power View infrastructure to the external AS server.

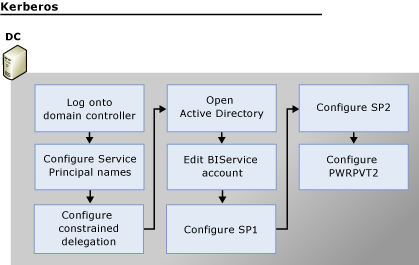
|  |  |  |  |
| --- | --- | --- | --- |
| **Client computer** | **Tabular data source** | **Connection** | **Results** |
| Power View on SP1 | ***DS3*** | Report Data source | **Test connection**  Fails because a double-hop is involved. Trace reveals that user attempting the connection appears as NT AUTHORITY\ANONYMOUS LOGON. To resolve:   * Use stored credentials * Use **Set Execution Context** option * Configure Kerberos   **Report**  Fails if user connecting with one of the three options listed does not have permission to read the data in the Analysis Services tabular instance. |
| Power View on SP2 | ***DS3*** | Report Data source | **Test connection**  same as above  **Report**  same as above |
| Power View on SP1 | ***DS3*** | BISM | **Test connection**  If you set up Kerberos, succeeds when RS impersonates BI\BIAdmin and queries data from DS3.  If you have not set up Kerberos, succeeds because RS sets the EffectiveUserName property to a value of BI\BIAdmin when it connects as BI\BIService, its identity.  This tactic succeeds because BI\BIAdmin has permission on the cube.  Note: To make the <EffectiveUserName> connection string property work, the user making the connection to Analysis Services must be a member of the Server Administrator role in Analysis Services.  If the service accounts for AS and RS did not match, you would have to add the identity of the RS service application to the Server Administrator role on DS3.  **Report**  A blank Power View report appears with an open connection to DS3. The connection is made by BI\BIService on behalf of the logged in user. |
| Power View on SP2 | ***DS3*** | BISM | **Test connection**  same as above  **Report**  same as above |

In short, if a double-hop is involved, you can use stored credentials or use the EffectiveUserName property, assuming the accounts on the Reporting Services and Analysis services are configured as shown in the setup section of the this paper. Otherwise, you can configure Kerberos as described in the [Appendix](#_Appendix:_Configuring_Kerberos) of this paper.

# Appendix: Configuring Kerberos

The instructions in this section describe how you can set up Kerberos to support the double-hop from the SharePoint server that hosts the Power View reports, to the server that hosts the tabular models.

The diagram shows the overall series of tasks; detailed scripts are provided.



### Log in to Domain Controller

Log in to the domain controller (named ***DC*** in this paper) as administrator.

### Configure Service Principal Names

• Open an Administrative command prompt, and execute the following commands:

setspn -S http/SP1 bi\biservice

setspn -S http/SP1.bi.contoso.com bi\biservice

setspn -S http/SP2 bi\biservice

setspn -S http/SP2.bi.contoso.com bi\biservice

setspn -S msolapsvc.3/DS3 bi\biservice

setspn -S msolapsvc.3/DS3.bi.contoso.com bi\biservice

**Important**: These commands assume that no SPNs have previously been configured for this service account and these services. If you need to verify whether SPNS already exist for the BI\BIService account, execute the following command to list existing SPNs:

SetSPN -L BI\BIService

### Prepare to Configure Constrained Delegation

* Open **Active Directory Users and Computers**.

### Configure BIService

1. In the **Managed Service Accounts** node, double-click **BIService** to open the properties of this service account.
2. On the **Delegation** tab, select **Trust this user for delegation** **to specified services only** and then select **Use any authentication protocol**.
3. Click **Add**.
4. Click **Users or Computers**.
5. In the **Select Users or Computers** dialog box, for the **Enter the Object names to select** text box, type *BI\BIService*, and then click **OK**.
6. Click **Select All** to select the http service type for SP1 and SP2 and the msolapsvc.3 service type for DS3 and then click **OK**.
7. Select **Expanded** to view the netbios as well as the fully qualified domain name for each of the service type and computer pairings, and then click **OK**.

#### Configure SP1

1. In the **Computers** node, double-click ***SP1*** to open the properties of this computer. Note that the computer account is used, because the Claims to Windows Token Service is running under Local System.
2. On the **Delegation** tab, select **Trust this user for delegation to specified services only** and then select **Use any authentication protocol**.
3. Click **Add**.
4. Click **Users or Computers**.
5. In the **Select Users or Computers** dialog box, for the **Enter the Object names to select** text box, type *BI\BIService* and then click **OK**.
6. Click **MSOLAPSVC.3** for the ***DS3*** computer and then click **OK**.

#### Configure SP2

1. In the **Computers** node, double-click ***SP2*** to open the properties of this computer. Again, note that the computer account is used because the Claims to Windows Token Service is running under Local System.
2. On the **Delegation** tab, select **Trust this user for delegation to specified services only** and then select **Use any authentication protocol**.
3. Click **Add**.
4. Click **Users or Computers**.
5. In the **Select Users or Computers** dialog box, for the **Enter the Object names to select** text box, type *BI\BIService* and click **OK**.
6. Click MSOLAPSVC.3 for the ***DS3*** computer and then click **OK**.

#### Configure PWRPVT2

1. In the **Computers** node, double-click ***PWRPVT2*** to open the properties of this computer. The computer account is used because the Claims to Windows Token Service is running under Local System.
2. On the **Delegation** tab, select **Trust this user for delegation to specified services only** and then select **Use any authentication protocol**.
3. Click **Add**.
4. Click **Users or Computers**.
5. In the **Select Users or Computers** dialog box, for the **Enter the Object names to select** text box, type *BI\BIService* and click **OK**.
6. Click MSOLAPSVC.3 for the ***DS3*** computer and then click **OK**.

# Conclusion

Installing the Microsoft SharePoint 2010 SQL Server 2012 business intelligence environment in a single box or a multiple box environment is simple if you follow the steps above in a controlled environment. Indeed, even Kerberos is simple, if you get it right the first time – but debugging a broken environment is truly for experts. Furthermore, as this document shows, connecting to Analysis Services in multiple machine environments does not require Kerberos.

**For more information:**

<http://www.microsoft.com/sqlserver/>: SQL Server Web site

<http://technet.microsoft.com/en-us/sqlserver/>: SQL Server TechCenter

<http://msdn.microsoft.com/en-us/sqlserver/>: SQL Server DevCenter

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