Installing SQL Server 2008 R2 Express

PI Server 2010

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Published: 2010-Jul-27

Contents

Introduction

This document provides installation instructions for 64bit SQL Server 2008 R2 Express on a machine that will also host PI Server 2010 and PI AF 2010. The instructions use the most common installation and configuration options for SQL Server 2008 R2 Express on Windows Server 2008. There are two installation examples provided: 1) Using the SQL Server 2008 R2 Express setup file; 2) Using the Command Prompt tool.

SQL Server 2008 R2 Express has a subset of the features included in SQL Server 2008 R2. For detailed information on the features available in both editions, see http://msdn.microsoft.com/en-us/library/ms165636.aspx.

PI AF 2010 supports multiple versions and editions of SQL Server. It is important to note that SQL Server 2008 R2 Express cannot be a Primary Server in an AF Collective. If you choose SQL Express as a Secondary Server, it can be promoted to a Primary Server *only* if the SQL Express is first upgraded to a SQL Server edition like Standard or Enterprise.

For a complete list of PI AF 2010's supported SQL Server Versions and Editions, as well as supported Operating Systems, refer to the *PI AF Release Notes*. For a complete list of PI Server 2010's supported Operating Systems, refer to the *PI Server 2010 Release Notes*.

When installing PI Server 2010, PI AF 2010 and SQL Server on the same machine, the order of installation is: 1) SQL Server; 2) PI AF 2010; then 3) PI Server 2010.

Note: The instructions provided in this document assume English is the language being used. If you are installing SQL Server 2008 R2 Express in a language other than English, you will need to make the appropriate adjustments for the language being used.

Installing SQL Server Express

The PI Server 2010 Installation CD and the OSIsoft Technical Support web site include the installation executable file required to install the **Database with Management Tools** installation option of SQL Server 2008 R2 Express. Alternatively, you can download SQL Server 2008 R2 Express from: http://www.microsoft.com/express/Database/.

Note: This document provides instructions for installing 64bit SQL Server 2008 R2 Express on 64bit Windows 2008 Server. However, both 32bit and 64bit versions of SQL Server 2008 R2 Express are included on the PI Server 2010 Installation CD. The installation process is the same for both 32bit and 64bit of SQL Server 2008 R2 Express.

SQL Server 2008 R2 Express Prerequisites

Prior to installing SQL Server 2008 R2 Express, you must first install its prerequisites. Refer to http://msdn.microsoft.com/en-us/library/ms143506(SQL.105).aspx for details on the SQL Server 2008 prerequisites. For the purpose of this document, we are installing SQL Server 2008 R2 Express, which has the following prerequisites.

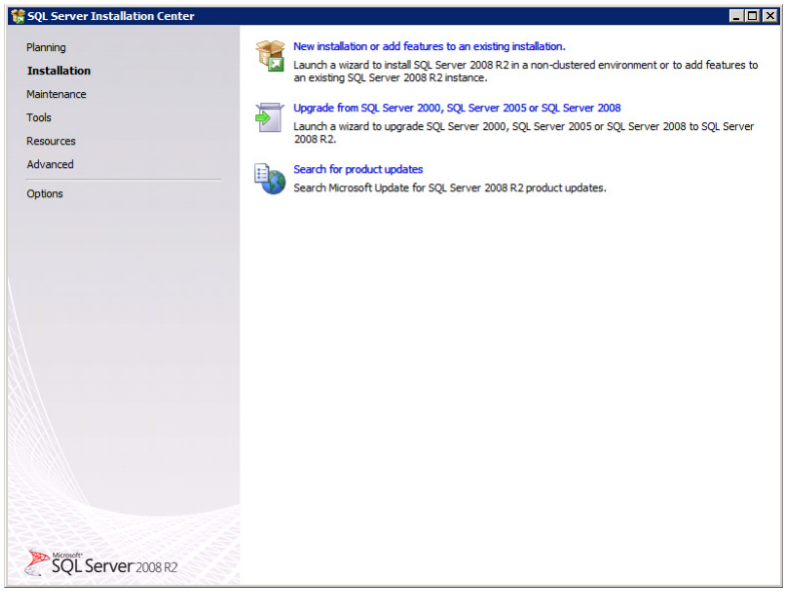
- Windows Installer 4.5
  http://www.microsoft.com/downloads/details.aspx?FamilyId=5A58B56F-60B6-4412-95B9-54D056D6F9F4&displaylang=en

- .Net Framework 3.5 SP1
  http://www.microsoft.com/downloads/details.aspx?familyid=AB99342F-5D1A-413D-8319-81DA479AB0D7&displaylang=en
  If you are installing on Windows 2008 Server R2, you can skip this install and enable the .Net Framework 3.5.1 server feature; this can be accomplished with the Server Manager (right-click **My Computer** and select **Manage**) in the Features node. If you are installing on Windows 2008 Server, you can skip this step IF the .Net Framework 3.5 SP1 was already installed as part of a Windows Update. You can verify this by viewing the Update History, which can be found in the Programs and Features in the Control Panel.
- Windows PowerShell 1.0
  http://www.microsoft.com/downloads/details.aspx?familyid=10EE29AF-7C3A-4057-8367-C9C1DAB6E2BF&displaylang=en
  If you are installing on Windows 2008 Server, you can skip this install and enable the PowerShell server feature; this can be accomplished with the Server Manager (right-click **My Computer** and select **Manage**) in the Features node.

Note: In this example installation, the User Account Control is disabled during the installation. Additionally, the Enhanced Internet Explorer security is disabled.

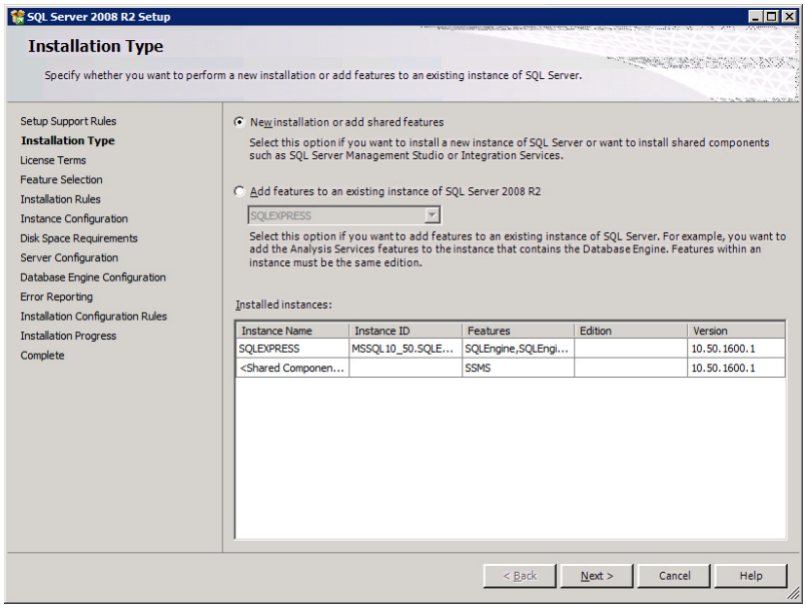
Installing SQL Server Express Using the Setup File

1. Right-click the SQL Server 2008 R2 Express setup file, `sqlexprwt_x64_enu.exe`, and select **Run as administrator** to launch the installation process. The SQL Server Installation Center displays.



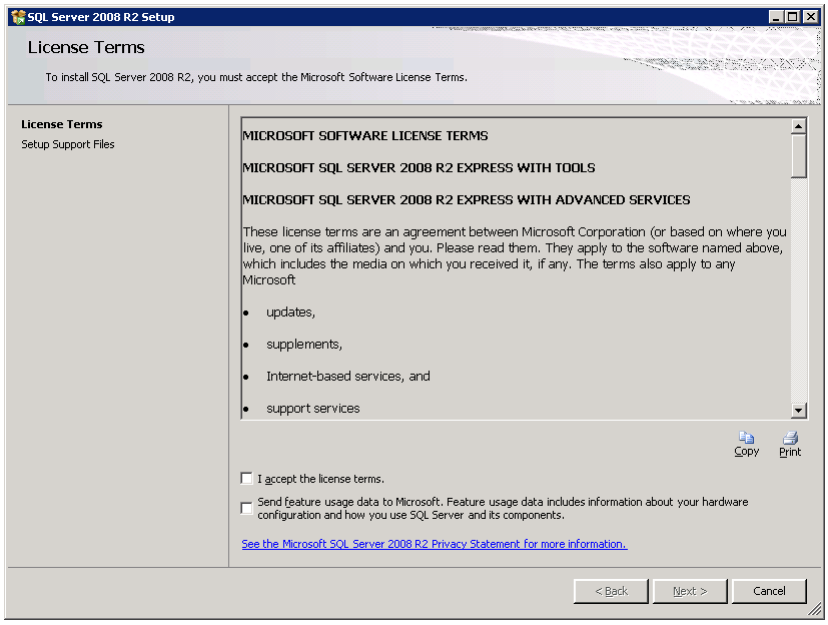
2. Select **Installation** in the left pane, then select **New installation or add features to an existing installation**.

3. If SQL Server is already installed, the **Installation Type** window displays.

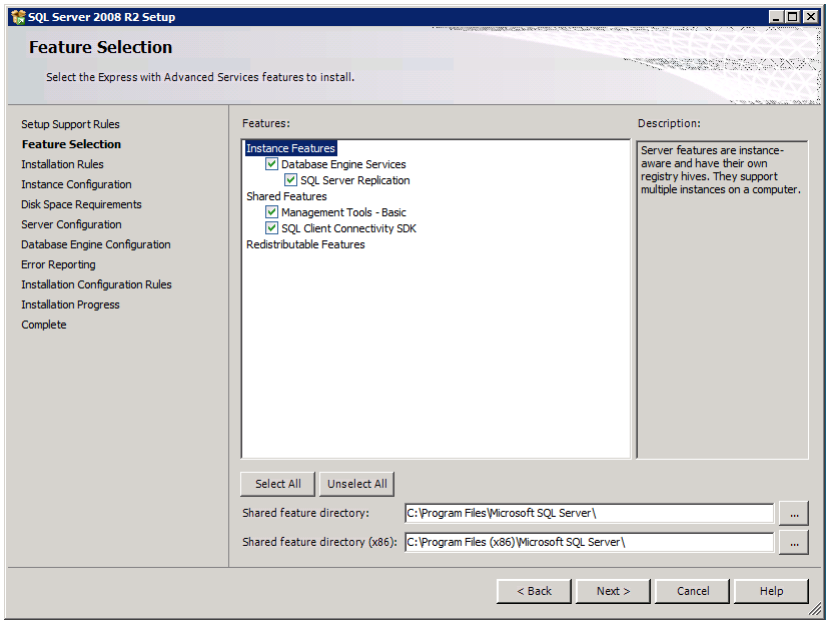


   a. With the **New installation or add shared features** option selection, click **Next**.

4. If all of the required prerequisites are installed, the SQL Server 2008 R2 Express Setup window displays with the **License Terms** page. Otherwise, a window displays that provides details on the prerequisites that need to be installed.



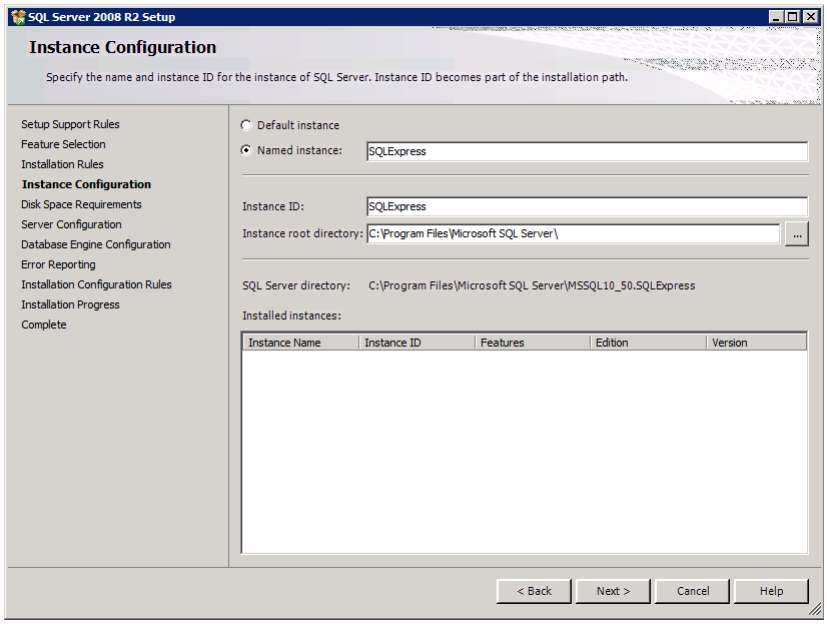
5. Review the License Terms. If you accept the terms, select **I accept the license terms** and click **Next**. The **Feature Selection** page displays.



6. In the **Features** area, select the following features:
   - Database Engine Services
     - SQL Server Replication
       SQL Express can be the subscriber to SQL Server replication. This is useful for an AF Collective.
   - Management Tools – Basic
   - SQL Client Connectivity SDK is automatically selected

Note: You may see other options if you have chosen the install kit for SQL Express with Advanced Tools. PI AF 2010 does not need any other SQL Server 2008 R2 Express features.

7. Click **Next**. The **Instance Configuration** page displays.



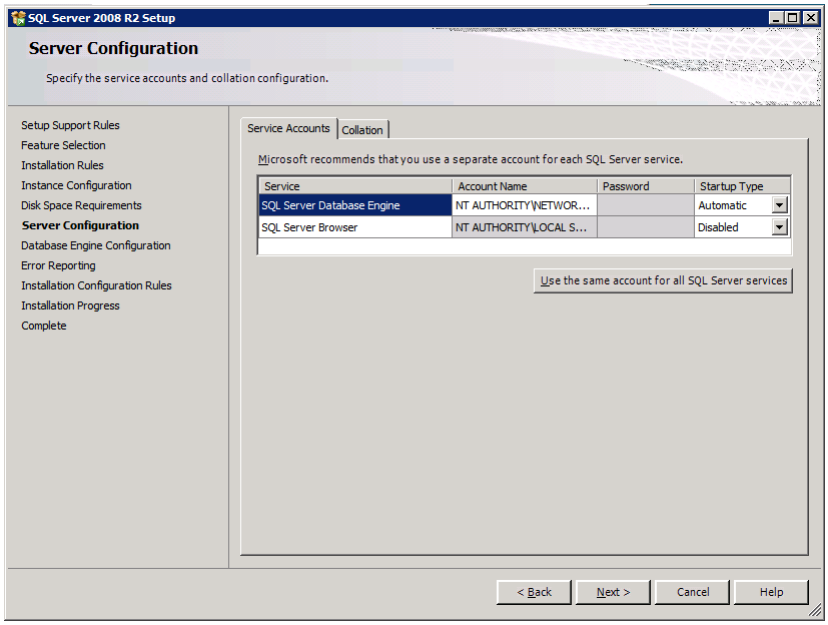
8. SQL Server allows for the installation of multiple copies of SQL Server on one machine. The **Installed instances** area displays a list of all instances currently installed.

   The **Default instance** option does not assign an instance name.

   The **Named instance** option requires an instance name and has the default name of SQLExpress. You can use a different name if you choose, however, it is recommended that you keep the default name of SQLExpress. You may want to make a note of the instance name, as you will need to provide this name when you install the AF Server 2010.

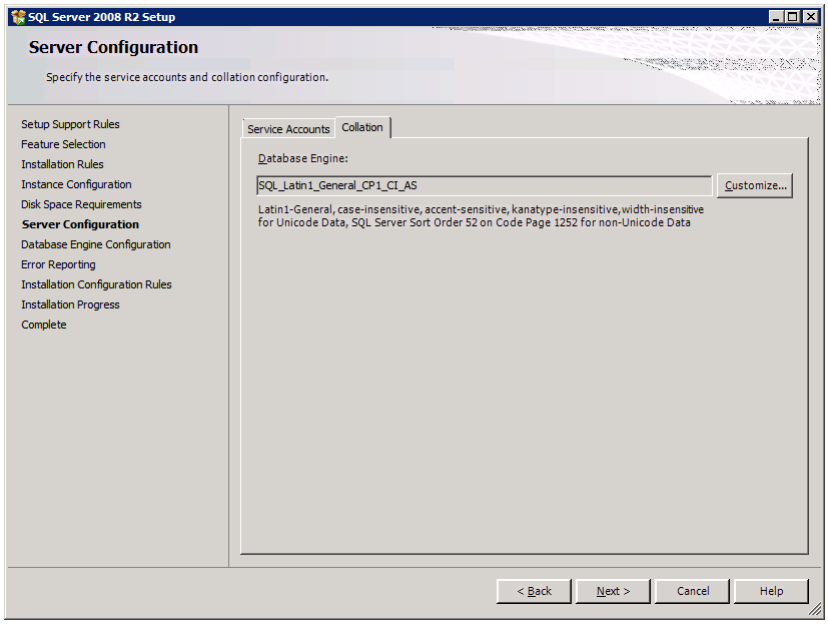
   You can change the **Instance root directory** if you want to install the SQL Server instance to a non-default location.

9. Click **Next** to continue. The **Server Configuration** page displays.



10. It is very important to configure the SQL Server services to run under accounts that do not have more security access than is needed. You should never run the SQL Server database engine under the local administrator, domain administrator, or local system account, or any other account with local or domain administrative rights as this leaves the system open to a security attack.
11. The SQL Server Database Engine should be configured with a **Startup Type** of **Automatic**.
12. Configure the SQL Server Browser with a **Startup Type** of **Disabled**.

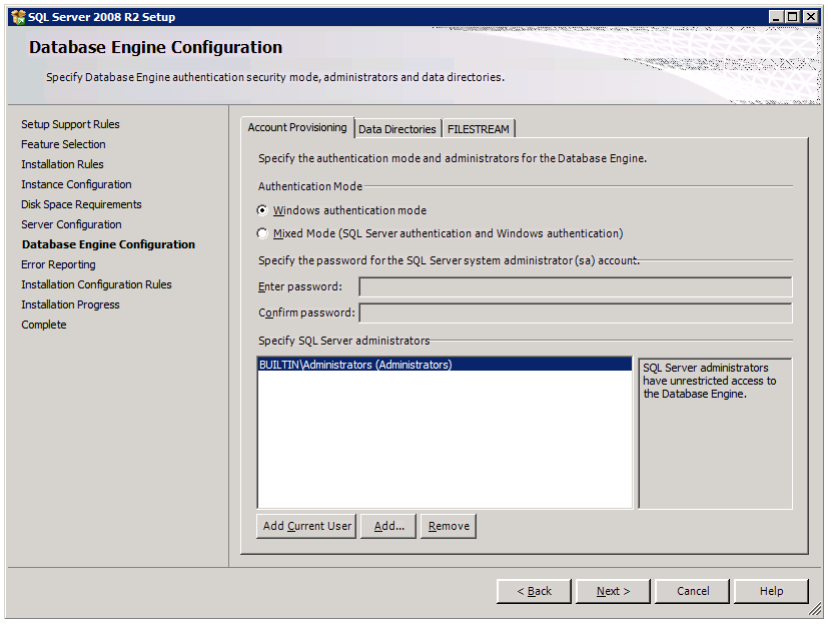
    The best security practice is to keep the SQL Server Browser service disabled. Only if remote access to this SQL Server named instance is needed by an AF Server or SQL Server Management System would you want to enable this service. For additional information on the SQL Server Browser setting, refer to *Enabling Network Communications* (page 17).
13. Select the **Collation** tab, if you know that you need to use a specific Collation setting.



For SQL Server, the Collation setting specifies the desired character set and sort properties. PI AF 2010 testing was done mostly with a Collation of **SQL_Latin1_General_CP1_CI_AS**. However, basic testing was performed with the default collation for each of the languages supported by PI AF 2010.

Note: There are known issues with Case Sensitive collations and certain Scandinavian collations.

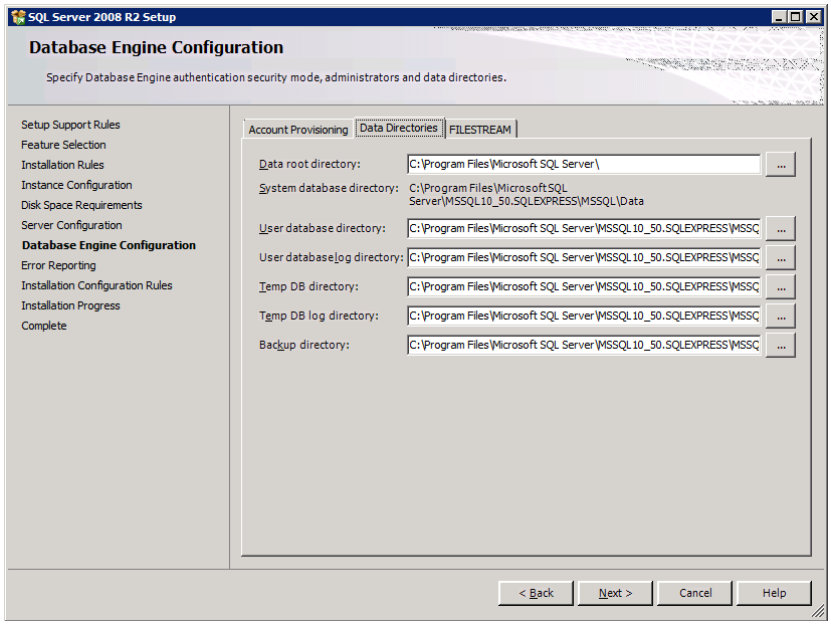
14. Click **Next**. The **Database Engine Configuration** page displays.



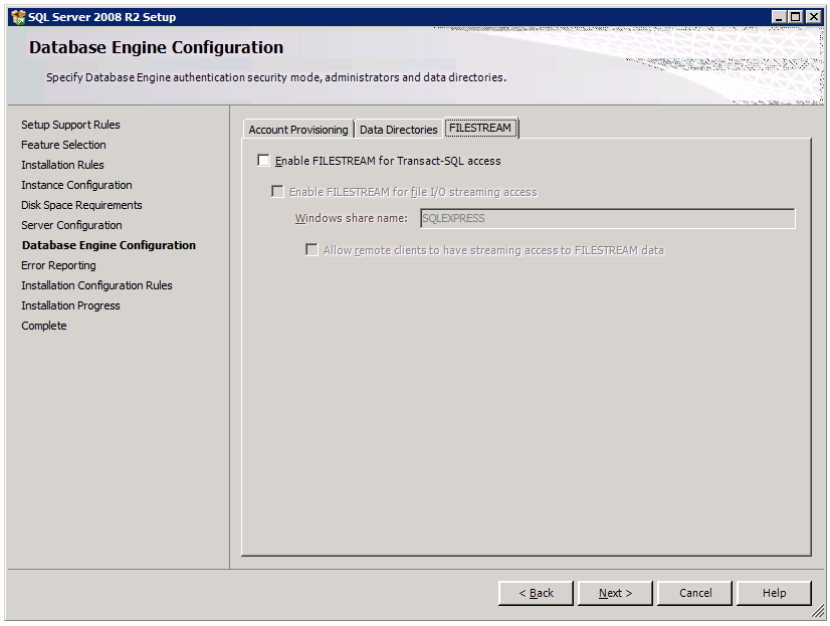
15. Choose the **Windows authentication mode** option.

Normally, you should not enable the **Mixed Mode** authentication option unless you are installing in an environment where the Windows account under which the AF Server service runs cannot be given the appropriate permissions to access AF data in SQL Server. This will be the situation if a trust has not been defined between the Active Directory domains of the SQL Server machine and the AF Server service account. This will not be a problem if the AF Server and the SQL Server are on the same box, which is the example installation being presented in this document.

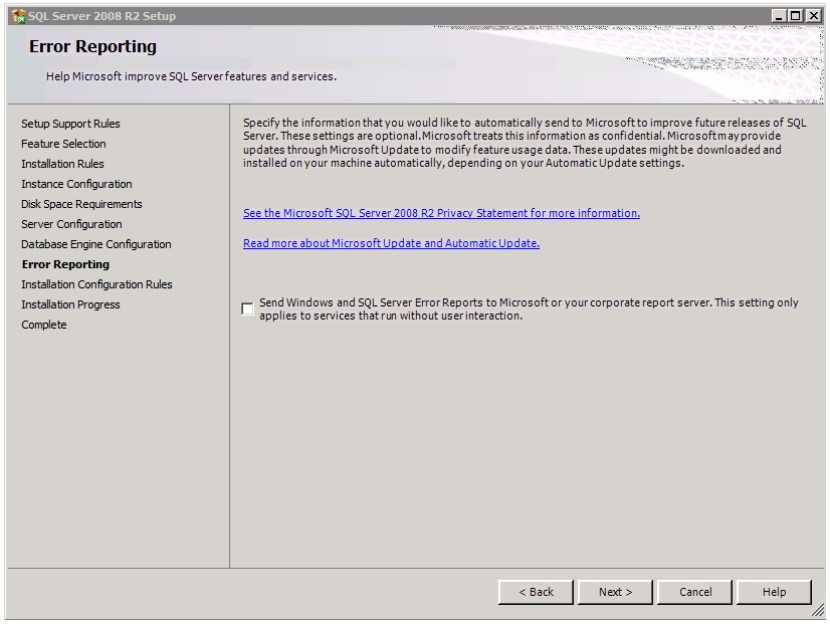
16. Add the BUILTIN\Administrators group as the **SQL Server administrators**.
    a. Click the **Add** button.
    b. In the **Select Users, Computers, or Groups** dialog, click the **Locations** button.
    c. Select the machine and click **OK**.
    d. In the **Enter the object names to select (examples)** list, enter **Administrators** and click **OK**. **BUILTIN\Administrators** is now in the **Specify SQL Server administrators** list.
    e. In general, you should remove the account of the person running the install, which is added to the list by default.
17. Click the **Data Directories** tab. You have the opportunity to change the directories in which SQL Server will write data, logs, backup, and temporary data. In a simple installation, accept these defaults. In a more complex installation, best practice is to store data, logs and backup on separate physical media.



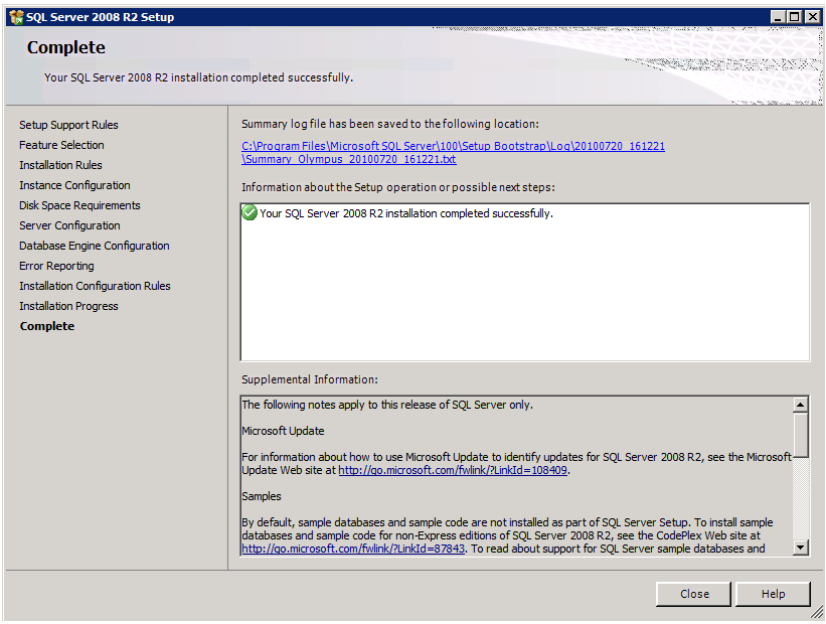
18. Click the **FILESTREAM** tab. FILESTREAM is a feature of SQL Server 2008 R2 that allows for storing large files "near" SQL Server and for backing up these files with the SQL Server backup. AF does not use this feature. You should leave this feature disabled.



19. Click **Next**. The **Error Reporting** page displays. If you want to enable error reporting, select the box, otherwise leave it unselected.



20. Click **Next** to start the installation. It may take up to 20 minutes to complete. When the installation is complete, the **Complete** page displays with a message indicating status of the installation. You should see a message indicating the installation was successful.



21. Click **Close** to complete the installation process. SQL Server is now ready to be configured.

Installing SQL Server Express Using the Command Line

SQL Server 2008 R2 Express can also be installed via the Command Prompt.

Note: The instructions provided in this document assume English is the language being used. If you are installing SQL Server 2008 R2 Express in a language other than English, you will need to make the appropriate adjustments for the language being used. For the Command Line installation, you will need to change the .exe file name, the Group name and the Account name.

The following is an example command that installs 64bit SQL Server 2008 R2 Express with Management Tools:

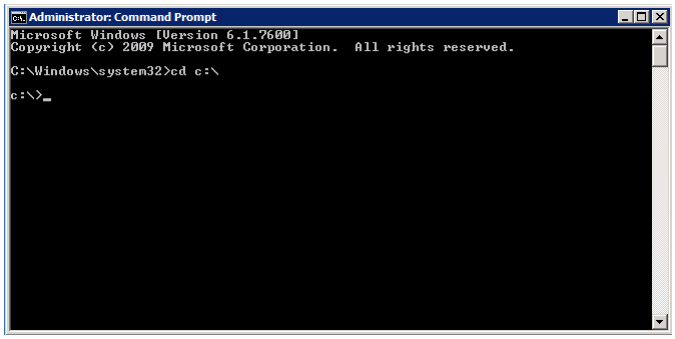
```
sqlexprwt_x64_enu.exe /QS /IACCEPTSQLSERVERLICENSETERMS /Action=install
/Features=SQL,Tools /InstanceName=SQLExpress
/SQLSYSADMINACCOUNTS="Builtin\Administrators" /TCPENABLED=0
/SQLSVCSTARTUPTYPE=Automatic /SQLSVCACCOUNT="NT Authority\Network Service"
/AddCurrentUserAsSQLAdmin=0
```

For detailed information on the command line parameters, see: http://msdn.microsoft.com/en-us/library/ms144259.aspx#Install. Details are included for both SQL Server 2008 R2 and SQL Server 2008 R2 Express.

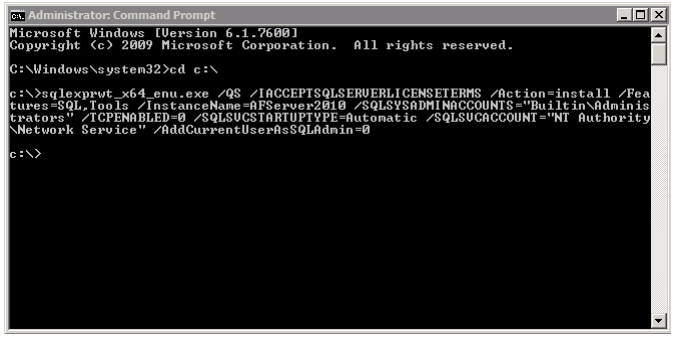
By using the command line installation option, you will not need to interact with the installation process; the command line includes the data required for the example installation being presented in this document. You will not see any messages indicating the installation is complete.

1. From the **Start** menu, right click the **Command Prompt** and select **Run as administrator**. The **Command Prompt** window displays.

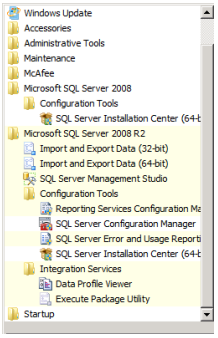
2. Change the directory to the location of the SQL Server setup file by entering the `CD` command followed by the complete path to the setup file and then pressing **Enter**. Example: `cd C:\`.



3. Select and copy the command line above. In the **Command Prompt** window, right-click and select **Paste**. The complete command is copied into the window.



4. Press **Enter** to start the SQL Server installation process. It may take up to 20 minutes to complete.
5. When there are no more SQL Server installation windows being displayed, the installation is complete. You can verify the install is complete by checking the contents of your **Start** menu.



6. Your SQL Server is now ready to be configured.

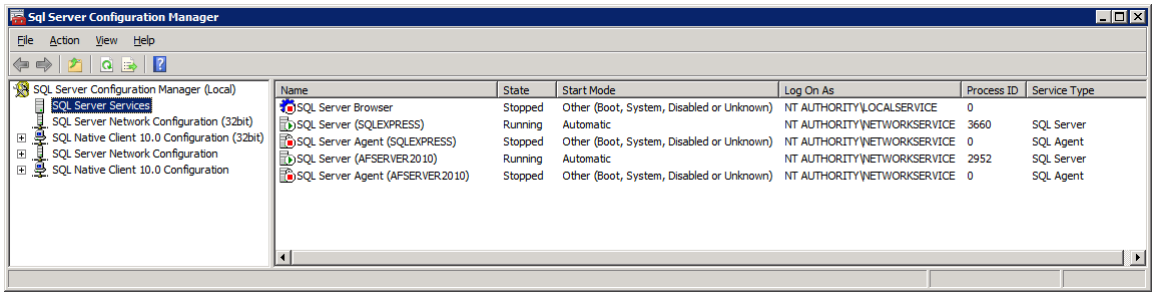
Configuring SQL Server 2008 R2 Express

After completing the SQL Server 2008 R2 Express installation, configuration tasks maybe required. You should verify the SQL Server Database engine service is configured correctly. Additionally, if your SQL

Server installation is different than the example presented in this document, you may need to enable network communications.

Configuring the SQL Server Database Engine Service

1. From the **Start Menu**, click **All Programs**, then click **Microsoft SQL Server 2008 R2**, then click, **Configuration Tools** and then select **SQL Server Configuration Manager**. The contents of the SQL Server Configuration Manager window can be different depending on the version of SQL Server installed and the number of SQL Server instances installed.



2. Select the **SQL Server Services** node in the left pane to display the SQL Server services for the local machine. The SQL Server database engine Name contains the SQL Server instance name in parentheses. In this installation example, **SQL Server (SQLEXPRESS)** is the database engine service for the installed instance.

   Had a differently named instance been installed, it would be displayed as **SQL Server (InstanceName)**. Had the **Default instance** option been selected during the install (*see page 9*), it would be displayed as **SQL Server (MSSQLSERVER)**.

   Note: You should never run the SQL Server database engine under the local administrator, domain administrator, local system account, or any other account with local or domain administrative rights as this leaves the system open to a security attack.

3. The SQL Server database engine service for your SQL Server instance should be configured for **Automatic Start Mode**. If the SQL Server database engine's **Start Mode** is NOT **Automatic**, double-click the newly installed SQL Server database engine in the SQL Server Services list.

   a. In the **Properties** dialog, select the Service page.

   b. Change the Start M**ode** to **Automatic**.

4. If you want to change the account under which the SQL Server database engine runs, select the **Log On** page in the **Properties** dialog.

   a. You can select a different Built-in account, or select the This account option to define a domain account and password.

5. Click **OK** to save the changes. The SQL Server database engine service will be restarted.

Enabling Network Communications

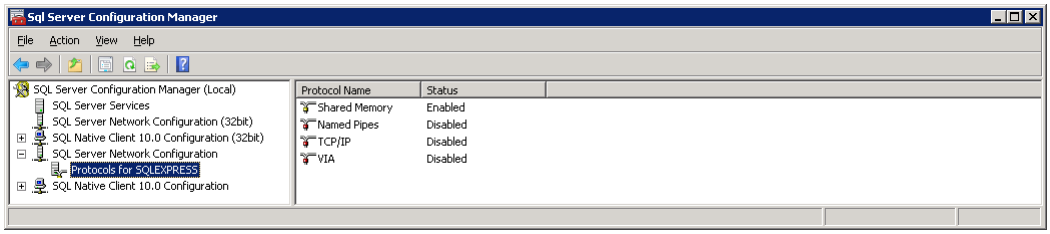
The recommended best security practice for an installation of SQL Server 2008 R2 Express, PI Server 2010, and PI AF 2010 on a single machine, is to disable both TCP/IP and Named Pipes protocols and to disable the SQL Server Browser service.

If your installation is different than the example presented in this document, you may need to enable network communications (by default, SQL Server 2008 R2 Express disables network communications). To enable network communications you need to enable a network protocol. You may need to configure the SQL Server Browser service for automatic startup (only if the installed SQL Server instance is Named).

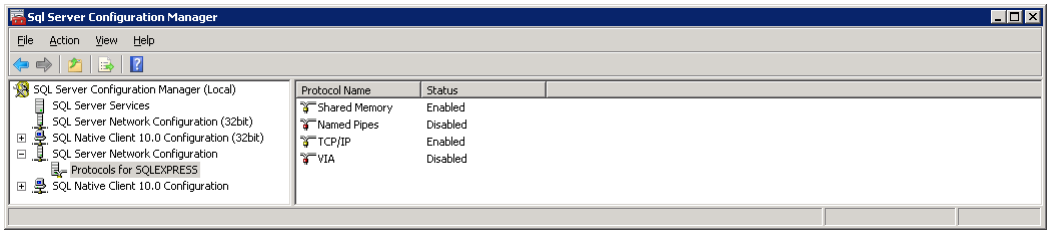
Note: You should enable network communications ONLY if the AF Server is going to be run on a different machine, OR if you want to connect to the newly installed SQL Server instance using the SQL Server Management Tools and/or SQL Server Profiler from a different machine.

Enabling the TCP/IP Network Protocol

1. From the **Start Menu**, click **All Programs**, then click **Microsoft SQL Server 2008 R2**, then click, **Configuration Tools** and then select **SQL Server Configuration Manager**. The contents of the SQL Server Configuration Manager window can be different depending on the version of SQL Server installed and the number of SQL Server instances installed.
2. Expand the **SQL Server Network Configuration** node in the left pane, then select the **Protocols for SQLEXPRESS** (where SQLEXPRESS is the instance name of the SQL Server instance installed in this example). The TCP/IP Protocol is disabled, by default.



3. Right-click the TCP/IP protocol and select **Enabled**. The TCP/IP Status changes to **Enabled**.

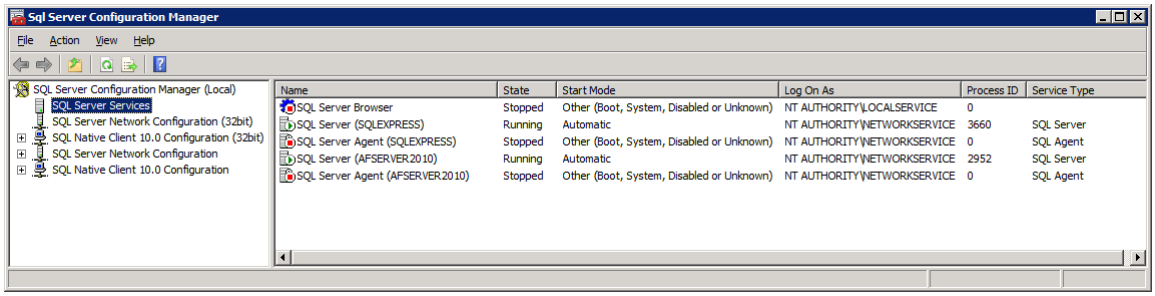


4. After the TCP/IP protocol is enabled, you need to restart the SQL Server database engine service before the configuration change will take effect.

Enabling the SQL Server Browser Service

If you are enabling network communications AND if your SQL Server instance is Named, then you will need to configure the SQL Server Browser service for automatic startup.

1. From the **Start Menu**, click **All Programs**, then click **Microsoft SQL Server 2008 R2**, then click, **Configuration Tools** and then select **SQL Server Configuration Manager**. The contents of the SQL Server Configuration Manager window can be different depending on the version of SQL Server installed and the number of SQL Server instances installed.

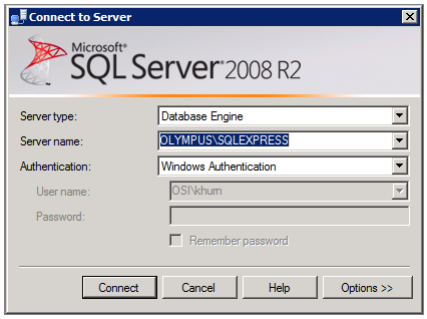


2. Select the **SQL Server Services** node in the left pane to display the SQL Server services for the local machine.
3. Double-click the SQL Server Browser service in the SQL Server Services list.
   a. In the **Properties** dialog, select the Service page.
   b. Change the Start Mode to Automatic.
   c. Click **OK** to save the changes.
4. Right-click the SQL Server Browser service and select **Start**. The **State** of the SQL Server Browser service changes to **Running**.

Making General Configuration Changes to SQL Server

You can modify most of the configuration options that were defined as part of the SQL Server installation process. You can change some of the configuration options from within the Microsoft SQL Server Management Studio. Some changes will require a restart of the SQL Server Database Engine Service.

1. From the **Start Menu**, click **All Programs**, then click **Microsoft SQL Server 2008 R2**, and then click **SQL Server Management Studio**. The **Connect to Server** dialog displays.

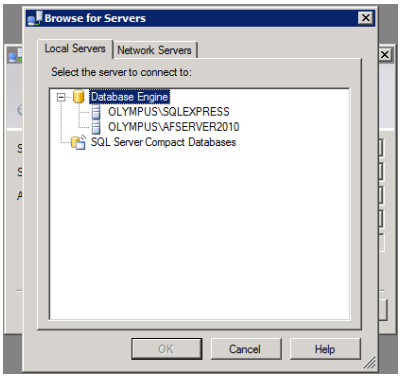


2. Ensure the **Server type** setting is **Database Engine** and the **Authentication** setting is **Windows Authentication**.
3. If the newly installed named instance displays in this **Server name** list, the format is [MachineName]\SQLEXPRESS, you can skip this step.

   Otherwise, you will need to locate the correct named instance in the **Server name** list.

a. In the **Server name** field, you may see any of the following:
   - **(local)**
   - **[MachineName]\[InstanceName]**
   - **.\ [InstanceName]** (the "." indicates the local machine)

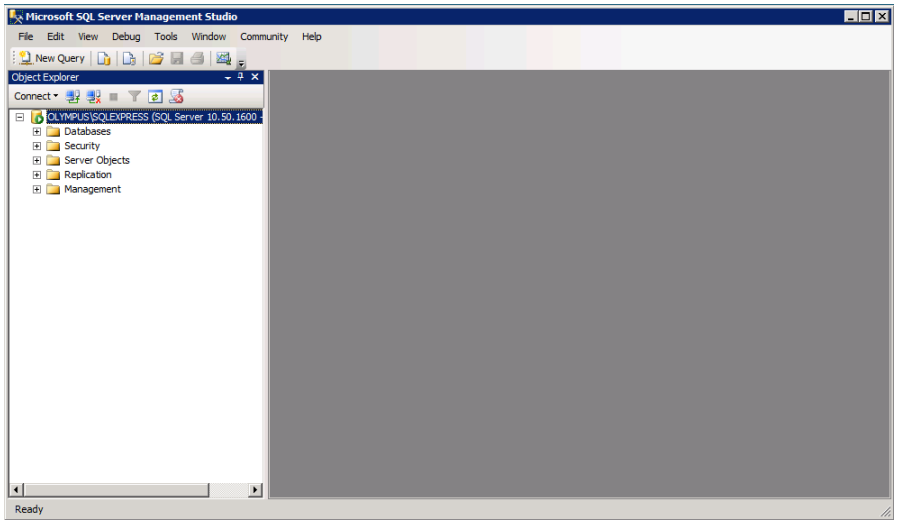
b. You can search for a different named instance by clicking the **Server name's** drop down arrow and selecting **<Browse for more…>**. The **Browse for Servers** dialog displays.



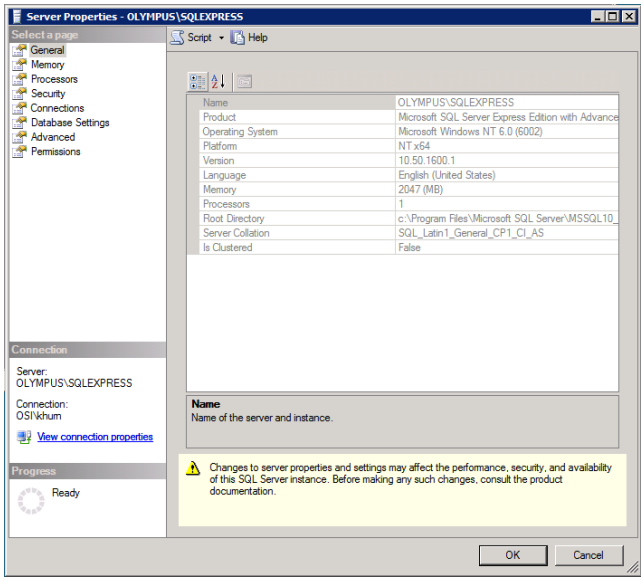
c. Expand the **Database Engine** node to see the name of each of the SQL Server instances installed on the local machine. As a side note, if you need to connect to a SQL Server instance on a different machine, you can select the **Network Servers** tab and browse for the SQL Server instance on the network.

d. Select the appropriate SQL Server instance and click **OK**.

4. Once the correct SQL Server instance is listed in the **Server name** field in the **Connect to Server** dialog, click **Connect**. The Microsoft SQL Server Management Studio window displays with the selected SQL Server instance displayed in the Object Explorer pane.



5. Right-click the SQL Server instance name and select **Properties**. The **Server Properties** dialog for the selected SQL Server instance displays.



a. You can browse through the property pages to review the current configuration.

b. If changes are necessary, you can make changes to any attributes that are not disabled.

c. Click **OK** to save any changes, or click **Cancel** to cancel changes.

6. If necessary, you can restart the SQL Server instance by right-clicking the SQL Server instance name and selecting **Restart**.

You can now install PI AF 2010 and then PI Server 2010.

Index