

1 BASIC SQL SERVER 2016 INTEGRATION SERVICES BUILD GUIDE

POWERSHELL SCRIPT BUILD

Humongous

Humongous.RonsNotes.Training.Local

- Domain Controller
- Active Directory Domain Services (ADDS)
- ADDS Forest
- DNS Server

- OS: Windows Server 2016



- SQL Server 2016 (2 Instances)
Analysis Services
Integration Services
Reporting Services
- SQL Server Management Studio
- SQL Server Data Tools

HOST PC REQUIREMENTS

- 64-Bit
- Windows 8.1 Pro or Windows 10 Pro or Server 2012 or higher
- 100 GB of free space
- Over 12GB of memory
- A processor capable of Hyper-V
- Hyper-V enabled
- Ability to run as administrator

SOFTWARE NEEDED

- Download the required folders and corresponding PowerShell scripts
- ISO of Server 2016
- ISO of SQL Server 2016
- SQL Server Management Studio (SSMS)
- SQL Server Data Tools

PHASE 01 HYPER-V SETUP AND FILE STRUCTURE BUILD

Task	Script
Enable Enhanced Mode in Hyper-V	01 BUILD FILE STRUCTURE CREATE VIRTUAL SWITCHES ON HUMONGOUS.PSI
Create Virtual Switches	01 BUILD FILE STRUCTURE CREATE VIRTUAL SWITCHES ON HUMONGOUS.PSI

Build the File Structure	01 BUILD FILE STRUCTURE CREATE VIRTUAL SWITCHES ON HUMONGOUSPSI
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In our tests, this phase took about 5-7 minutes.

In this phase, you will:

- Enable Enhanced Mode in Hyper-V.
- Create Virtual Switches in Hyper-V.
- Build a File Structure.



The PowerShell scripts will use this file structure to automate the build. Therefore, the naming needs to be exact.

We use the same file structure for the licensed and evaluation software build, so some folders may be used in one and not the other.



IMPORTANT! You will need to have the latest version of PowerShell (5.1) installed on your host machine. PowerShell 5.1 is installed by default on Server 2016 and Windows 10. If your host machine does not run either of these operating systems, you will need to install PowerShell 5.1 in order to execute these scripts. To download PowerShell 5.1, use the following link:
<https://msdn.microsoft.com/en-us/powershell/wmf/5.1/install-configure>.

Task: Enable Enhanced Mode in Hyper-V

- If you prefer the manual step-by-step GUI instructions for this task, [click here](#).


Task: Create Virtual Switches

- If you prefer the manual step-by-step GUI instructions for this task, [click here](#).

Task: Build the File Structure

- If you prefer the manual step-by-step GUI instructions for this task, [click here](#).

In this phase, you will:

- Utilize a PowerShell script to enable enhanced mode.
 - Create virtual switches in Hyper-V.
 - Build the file structure to be used throughout the course.
1. Press **Windows** key and enter **Power**.
 2. Right-click the **Windows PowerShell ISE** icon, then click **Pin to taskbar**.
 3. Press **Esc** to return to the desktop.
 4. Navigate down to the taskbar, right-click **Windows PowerShell ISE** icon, right-click the new **Windows PowerShell ISE** icon showing, then click **Run as administrator**.
 5. In the **User Account Control** dialog box, click **Yes**.
 6. When **Windows PowerShell ISE** opens, review the options and settings available.
 7. In **Windows PowerShell ISE**, move up to the menu and click **File\Open...**
 8. In the **Open** dialog box, navigate to the **Single-ServerScripts** folder you downloaded or cloned from the GitHub repository for this RonsNotes.
 9. Locate and double-click to open [01 BUILD FILE STRUCTURE CREATE VIRTUAL SWITCHES ON HUMONGOUSPSI](#).
 10. When the file opens, review the script.
 11. Move to the toolbar above and click  to **Run Script**.

12. Review the results noticing **File Explorer** is open, and you are viewing the **RonsNotes** folder.
13. Press the **Windows** key.
14. Enter **Hyper-V Manager**.
15. Right-click the **Hyper-V Manager** icon and click **Pin to taskbar**.
16. Click to open **Hyper-V Manager**, move to the **Actions** pane on the right and click **Hyper-V Settings**.
17. Click **Enhanced Session Mode Policy** and verify there is a check in the **Allow enhanced session mode** check box. If not, place a check in the checkbox, click **Apply** and then click **OK**.
18. Again, click **Hyper-V Settings**, and then click **Enhanced Session Mode** and verify there is a check in the **Use enhanced session mode** check box. If not, place a check in the checkbox, click **Apply** and then click **OK**.

Upon completion, you will have enabled enhanced mode and created virtual switches in Hyper-V, as well as built the file structure.

PHASE 02 CREATE HUMONGOUS VM

Task	Script
Verifying the Correct Files Are in the Proper Location	02 CREATE HUMONGOUSVM.PSI
Creating Virtual Machine Humongous	02 CREATE HUMONGOUSVM.PSI

In our tests, this phase took approx. 20-30 minutes, but this depends completely on the speed of your hardware.

In this phase, you will:

- Download the installation files.
- Move the VM Specific script folder to the Scripts folder.
- Create the VM.
- Install Server 2016.

This phase creates the virtual machine that we will use. First, the script will create the Virtual Hard Drive (VHDX format).

We are assuming you are using evaluation licenses. If not, proceed as is and then at the end you can just convert to MSDN by changing your keys.

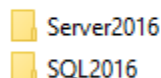
After creating the VM, the script will enable Guest Services and start Hyper-V Manager.

Task: Download the ISOs of Server 2016 and SQL Server 2016 to the Created Directories, and the Needed Database Files

In this task, we will download ISOs for the software we intend to install.

1. Switch back to **File Explorer** and verify you are still viewing **C:\RonsNotes**.
2. Double-click to open the **ISOs** folder, and notice you have two folders listed.

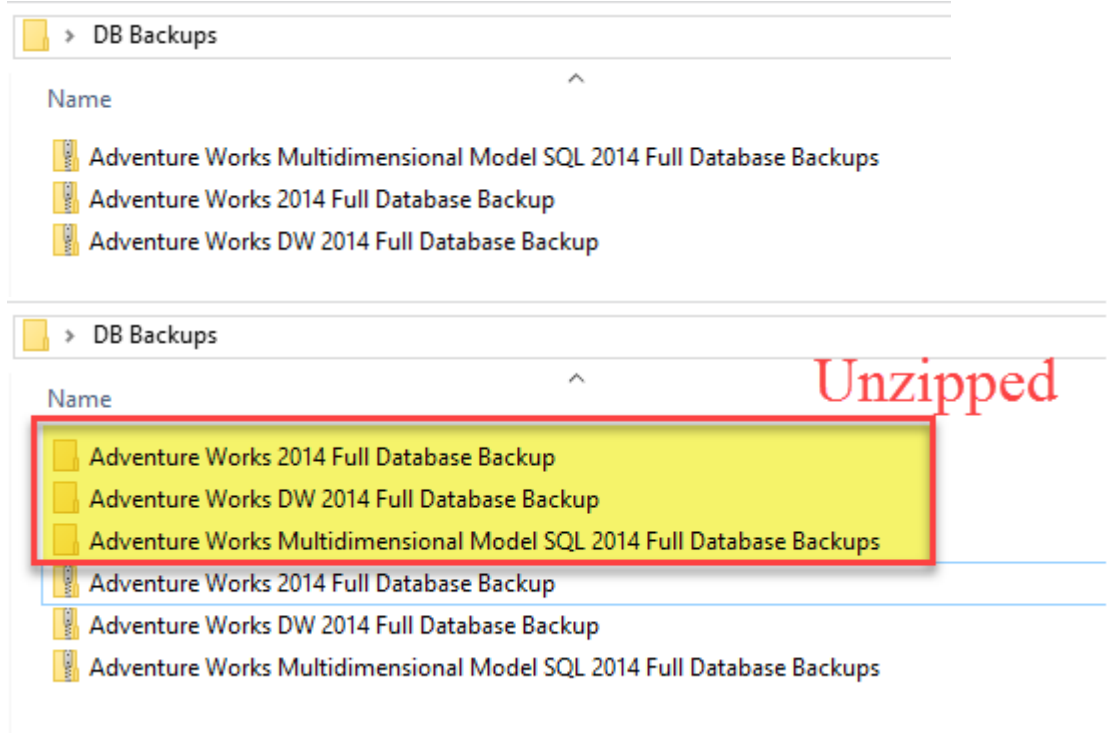
Name



3. Start **Internet Explorer** or the browser of your choice.

4. Using the links provided below:

- Download the installation files to the appropriate folder (shown above).
- Download the database files and place them into a folder named **DB Backups**.
 - The files will download as .zip files, which will need to be unzipped within the **DB Backups** folder.



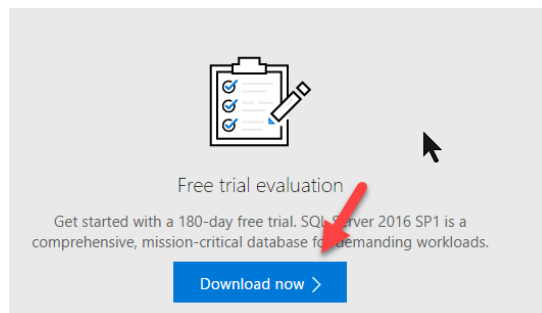
You will need to register in order to download the required ISO files.

- **Server 2016** – <https://www.microsoft.com/en-us/evalcenter/evaluate-windows-server-2016>
- **SQL Server 2016** - <https://www.microsoft.com/en-us/evalcenter/evaluate-sql-server-2016>

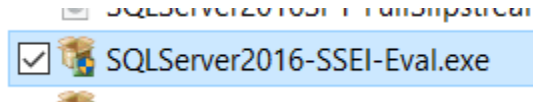


***SQL Server 2016 with SP1** has a slight change in procedures to get the ISO. If you instead intend to install SQL Server 2016 SP1, follow the steps below.*

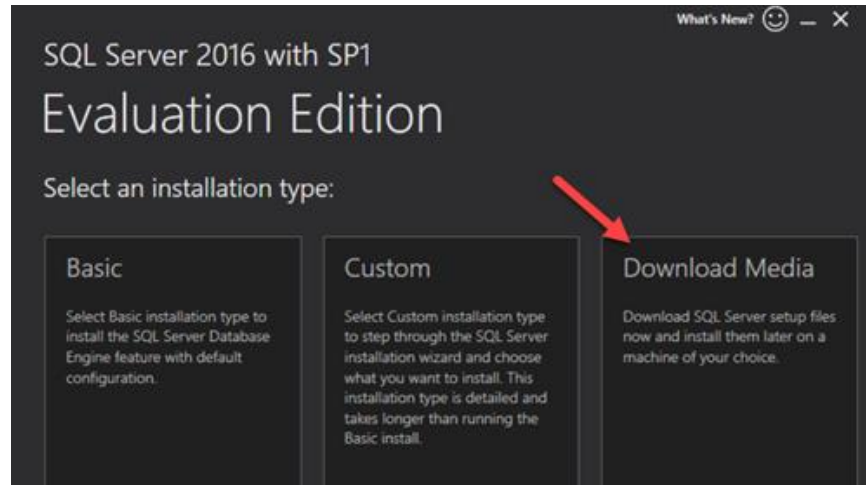
1. Search for **SQL Server 2016 evaluation download**.
<https://www.microsoft.com/en-us/sql-server/sql-server-downloads>.
2. Click **Download now**.



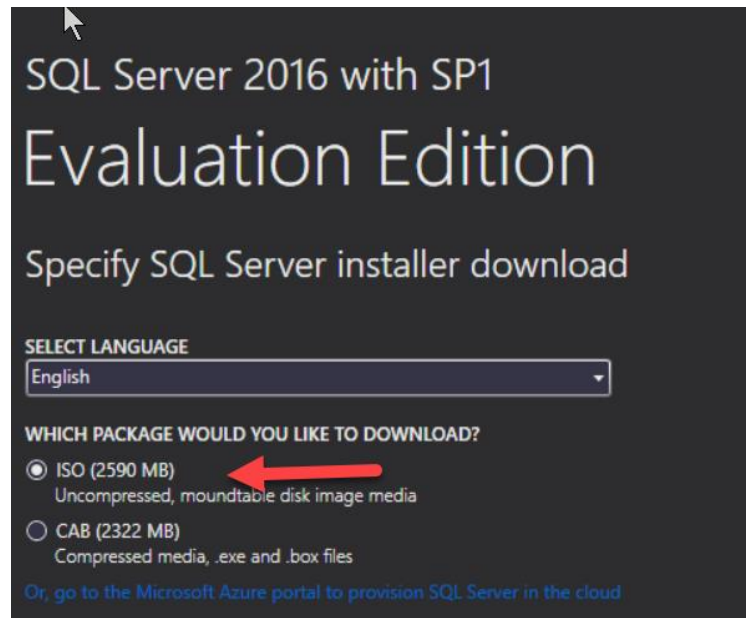
3. Fill out the registration document.
4. Click **Download now**.
5. Double click the downloaded EXE to start the process.



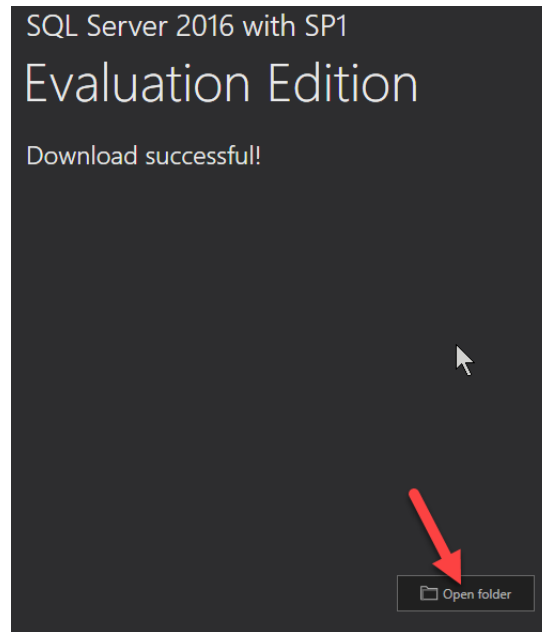
6. Select **Download Media**.



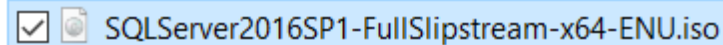
7. Leave **ISO** selected and download.



8. On success, Click **Open Folder**.



9. *Your ISO is available.*



10. *Close the downloader.*

11. *At the pop up click Yes.*

- **Adventure Works 2014** - <https://msftdbprodsamples.codeplex.com/releases/view/125550>
 - Adventure Works 2014 Full Database Backup.zip
 - Adventure Works DW 2014 Full Database Backup.zip
 - Adventure Works Multidimensional Model SQL 2014 Full Database Backups.zip

Upon completion, you will have the file structure built, and the downloaded ISOs placed into the proper locations, and the database files downloaded into the new **DB Backups** folder.

Task: Move the VM Specific Script Folder to the Scripts Folder

In this task, we will move the Script folders to the proper location. As we do not know to what location you downloaded the script folders from GitHub, we will do this move with File Explorer.

1. Locate your downloaded scripts folder.



The scripts can be found on GitHub, in the RonsNotes [course-specific repository](#). (Link below) You can either clone the repository or download the scripts.


2. Double-click to open **Single-ServerScripts**.
3. Using Copy/Paste, copy the **Humongous Scripts** folder and paste it into the **Scripts-Folder** that you created in Phase 01.

Task: Create the VM

- If you prefer the manual step-by-step GUI instructions for this task, [click here](#).

In this task, we will create our base VM.

1. Back in **Windows PowerShell ISE**, move up to the menu and click **File\Open....**
2. In the **Open** dialog box, navigate to the **Single-ServerScripts** folder you downloaded or cloned from the GitHub repository for this RonsNotes.

3. Locate and double-click to open [02 CREATE HUMONGOUS VM.PSL](#).
4. When the file opens, review the script.
5. Move to the toolbar above and click  to **Run Script**.
6. Switch to **Hyper-V Manager**, and you will see your **Humongous** VM present and running.
7. Right-click on the Humongous VM, then click **Settings** and review the configuration including the attached **Virtual switch** and the **IDE Controller** with the **Server 2016** and the **SQL 2016** ISOs loaded.
8. In the **Settings** dialog box, click **Cancel**.


Task: Install Server 2016

- If you prefer the manual step-by-step GUI instructions for this task, [click here](#).

In this task, we will install Server 2016.



The following is a manual operation with no scripts being used.

1. Back in **Hyper-V Manager**, right-click the **Humongous** VM and click **Connect...**
2. In the **Windows Setup** dialog box, click **Next**.
3. Click **Install now**.
4. In the **Select the operating system you want to install** dialog box, move the selection to the second option **Windows Server 2016 Standard Evaluation (Desktop Experience)**, and click **Next**.
5. In the **Applicable notices and license terms** dialog box, place a check in the **I accept the license terms** check box, and click **Next**.
6. In the **Which type of installation do you want** dialog box, click **Custom: Install Windows only (advanced)**.
7. In the **Where do you want to install Windows** dialog box, click **Next**.
8. Wait for the install to complete.
9. In the **Customize settings** dialog box, enter and confirm **Passw0rd** where P is upper-case and 0 is zero, and then click **Finish**.
10. Log on to the VM using **Cntr+Alt+End**, or by clicking the  icon in the VM toolbar, and entering **Passw0rd** where P is upper-case and 0 is zero.
11. Allow the virtual machine to fully start (wait for **Server Manager** to open).
12. You will see a prompt on the right asking **Do you want to allow your PC to be discoverable by other PCs and devices on this network**, click **Yes**.



If the virtual machine remains black, then use Hyper-V Manager to shut down and restart.
Optional step:

- a. You can run update on the Humongous server. This will take a long time but it is your choice. We tested this build with Server 2016 as-is without any updates, and it all worked, but this is strictly your call.
- b. To run an update, open **Server Manager**, click to select **Local Server**, then click the corresponding hyperlink to search for and install updates.

Until we connect the VM to the internet, it will not authenticate, meaning you have ten days to get past that phase of the setup.

13. In **Hyper-V Manager**, right-click the VM and click **Shut Down**.
14. In the **Are you sure you want to shut down ...** dialog box, click **Shut Down**.

PHASE 03 SETUP DOMAIN

Task	Script
Enabling Guest Services on the Virtual Machine	03 COPY FILES TO HUMONGOUS.PSI
Starting the Virtual Machine	03 COPY FILES TO HUMONGOUS.PSI
Copying Files to Humongous Server	03 COPY FILES TO HUMONGOUS.PSI
Renaming Humongous	01 RENAME TO HUMONGOUS.PSI
Creating the Domain and Configuring the Forest	02 CREATE DOMAIN.PSI
Create Student as Domain Administrator	03 ADD STUDENT AS DOMAIN ADMIN CREATE OUS AND OTHER ACCOUNTS.PSI
Turn Off Firewall	03 ADD STUDENT AS DOMAIN ADMIN CREATE OUS AND OTHER ACCOUNTS.PSI
Create Organizational Units	03 ADD STUDENT AS DOMAIN ADMIN CREATE OUS AND OTHER ACCOUNTS.PSI
Adding Active Directory Users	03 ADD STUDENT AS DOMAIN ADMIN CREATE OUS AND OTHER ACCOUNTS.PSI

In this phase, you will:

- Enable Guest Services on the Virtual Machine
- Start the Virtual Machine
- Copy Files to Humongous Server
- Rename Humongous
- Create the Domain and Configure the Forest
- Create Student as Domain Administrator
- Turn Off Firewall
- Create Organizational Units
- Add Active Directory Users

Task: Enabling Guest Services on the Virtual Machine

- If you prefer the manual step-by-step GUI instructions for this task, [click here](#).


Task: Starting the Virtual Machine

- If you prefer the manual step-by-step GUI instructions for this task, [click here](#).

Task: Copy files to Humongous Server

- There are no manual instructions for this step.

In this task, we will copy files to the newly created VM.

1. On your host machine, switch to **Windows PowerShell ISE**, move up to the menu and click **File\Open....**
2. In the **Open** dialog box, navigate to the **Single-ServerScripts** folder you downloaded or cloned from the GitHub repository for this RonsNotes.
3. Locate and double-click to open [03 COPY FILES TO HUMONGOUS.PSI](#).
4. When the file opens, review the script.
5. Move to the toolbar above and click  to **Run Script**.

Task: Rename Humongous

- If you prefer the manual step-by-step GUI instructions for this task, [click here](#).

Task: Creating the Domain and Configuring the Forest

- If you prefer the manual step-by-step GUI instructions for this task, [click here](#).

Task: Create Student as Domain Administrator

- If you prefer the manual step-by-step GUI instructions for this task, [click here](#).

Task: Turn Off the Firewall

- If you prefer the manual step-by-step GUI instructions for this task, [click here](#).

Task: Create Organizational Units

- If you prefer the manual step-by-step GUI instructions for this task, [click here](#).

Task: Adding Active Directory Users


- If you prefer the manual step-by-step GUI instructions for this task, [click here](#).

In this task, we will create the domain.

1. Back in **Hyper-V Manager**, double-click the **Humongous** VM to connect.
2. In the **Display configuration** dialog box, drag the slider all the way to the right (**Large**) and click **Connect**.
3. Log on as **Administrator** by entering **Passw0rd**, where the P is upper-case and the 0 is zero.
4. In **Humongous** VM, open **File Explorer** and navigate to the root of **C:**. Notice the files that were added by the previous script.
5. Right-click [01 RENAME TO HUMONGOUS.PSI](#), and click **Run with PowerShell**.



If you encounter the Execution Policy Change prompt, enter Y and then press Enter.

6. The VM will reboot.
7. Log on to the VM using **Cntr+Alt+End**, or by clicking the  icon in the VM toolbar, and entering **Passw0rd** where P is upper-case and 0 is zero.
8. Open **File Explorer** and navigate back to the root of **C:**.
9. Right-click [02 CREATE DOMAIN.PSI](#), and click **Run with PowerShell**.
 - This will take a little time. Ignore the yellow warnings. They are the same as you would receive if you did this from Add Roles in Server Manager.
 - The VM will reboot and this will also take some time as gpsvc is slow on initial load.
10. Log on as **Administrator** by entering **Passw0rd**, where the P is upper-case and the 0 is zero.
11. Open **File Explorer** and navigate back to the root of **C:**.
12. Right-click [03 ADD STUDENT AS DOMAIN ADMIN CREATE OUS AND OTHER ACCOUNTS.PSI](#), and click **Run with PowerShell**.



If you encounter the Execution Policy Change prompt, enter Y and then press Enter.

13. Switch to **Hyper-V Manager**, shut down the VM and then restart.

PHASE 04 SETUP SQL SERVER

Phase Objective

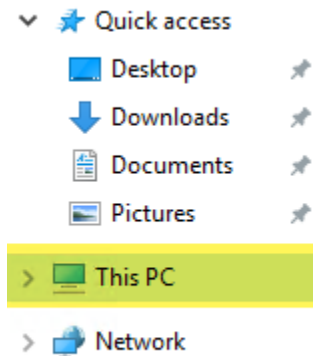
In this phase, we will set up SQL Server on the virtual machine. Phase Topics

- Install SQL Server 2016
- Install SQL Server Management Studio

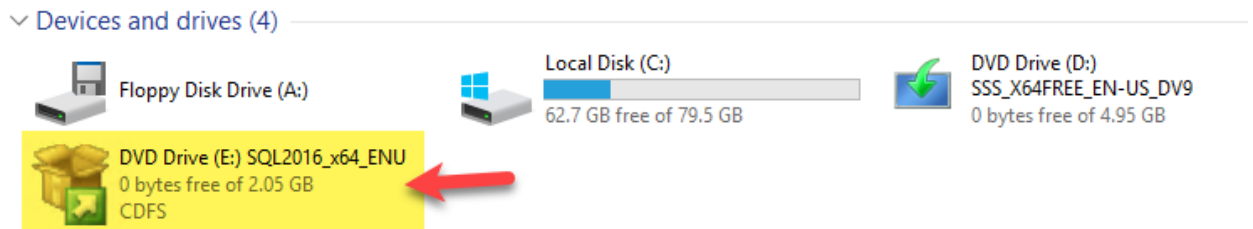
Task Install SQL Server 2016

1. In **Hyper-V Manager**, click to select **Humongous**, then right-click the virtual machine and select **Start**. (If it isn't already started.)
2. Double-click the **Humongous** virtual machine, then click **Connect**.

- At the logon screen, click **Other user** in the lower-left corner, then log in as **Student**.
- Start **File Explorer**.
- Navigate to the pane on the left and click to select **This PC**.



- Double-click **E:** drive.

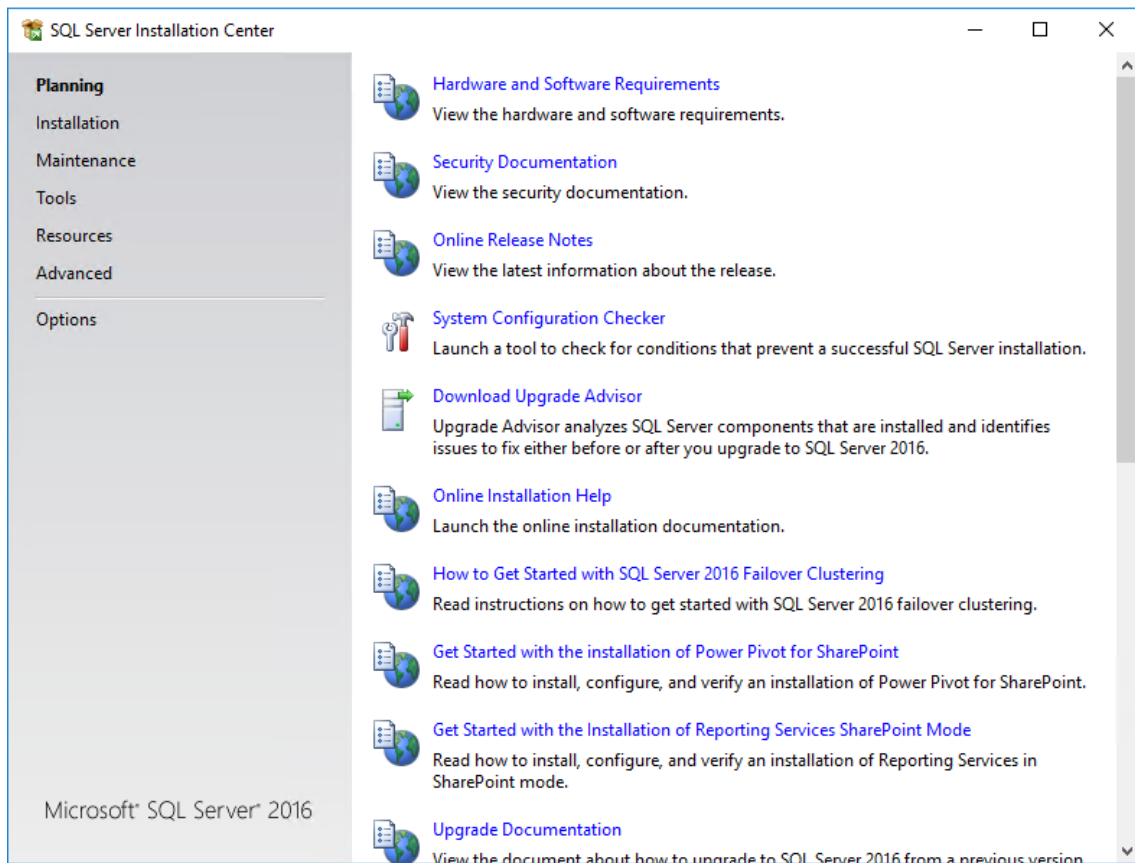


- When the list of files appears, locate and double-click **Setup.exe**.

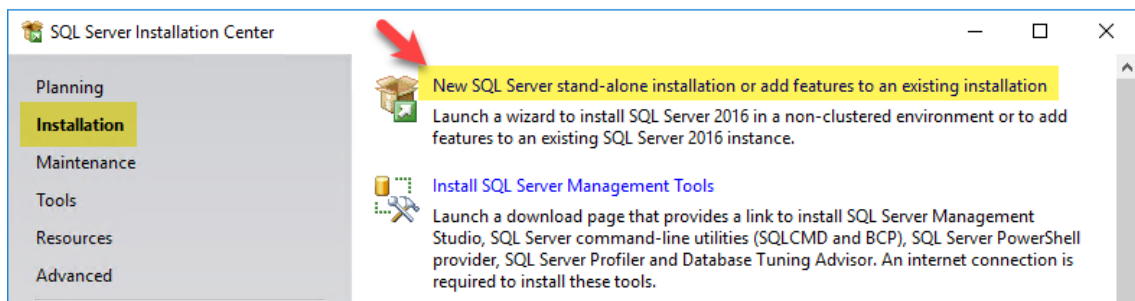
Name	Date modified	Type
1033_ENU_LP	5/3/2016 4:05 PM	File folder
redist	5/3/2016 4:10 PM	File folder
resources	5/3/2016 4:10 PM	File folder
Tools	5/3/2016 4:10 PM	File folder
x64	5/3/2016 4:10 PM	File folder
autorun	2/9/2016 7:38 PM	Setup Information
MediaInfo	4/30/2016 9:13 PM	XML Document
setup	4/30/2016 9:12 AM	Application
setup.exe.config	2/9/2016 7:34 PM	CONFIG File
SqlSetupBootstrapper.dll	4/30/2016 9:12 AM	Application extens...
sqmapi.dll	4/30/2016 9:12 AM	Application extens...

- In the **User Account Control** dialog box, click **Yes**.

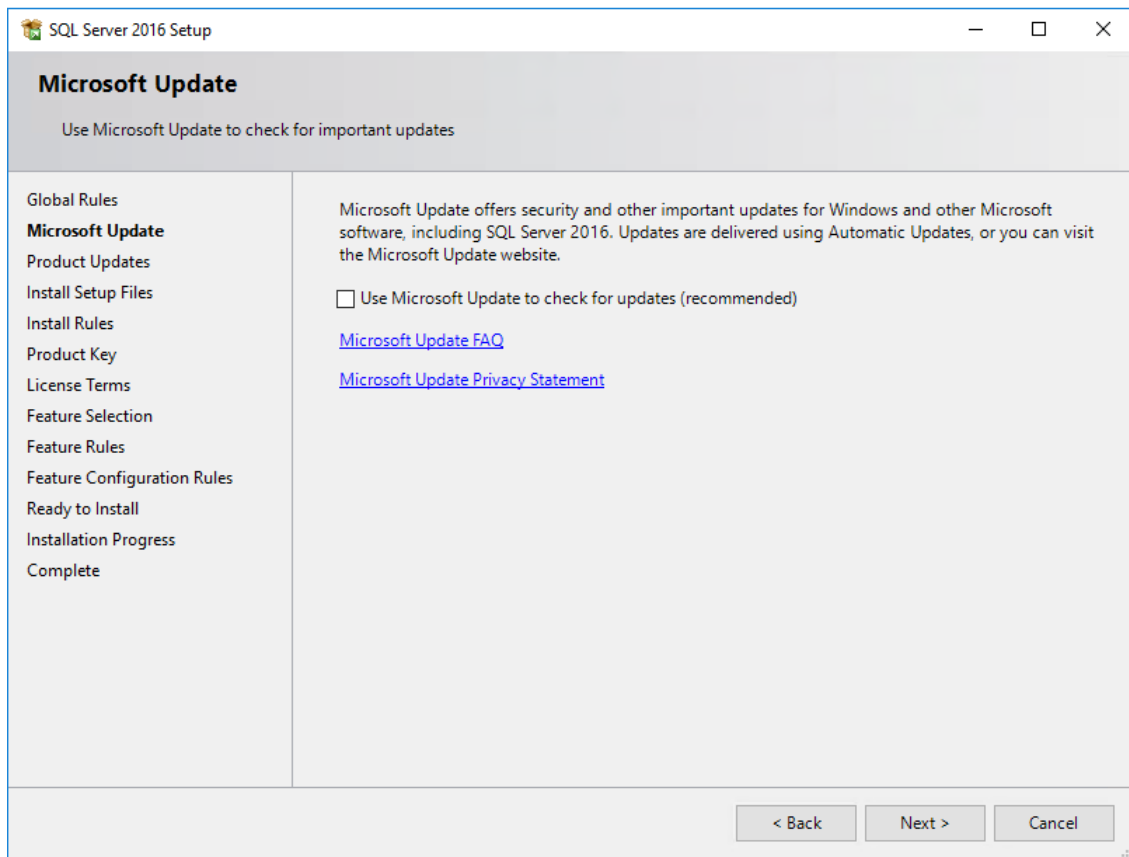
9. In the **SQL Server Installation Center** dialog box, review the options available.



10. Navigate to the pane on the left and click **Installation**.
11. Click the link for a **New SQL Server stand-alone installation or add features to an existing installation**.



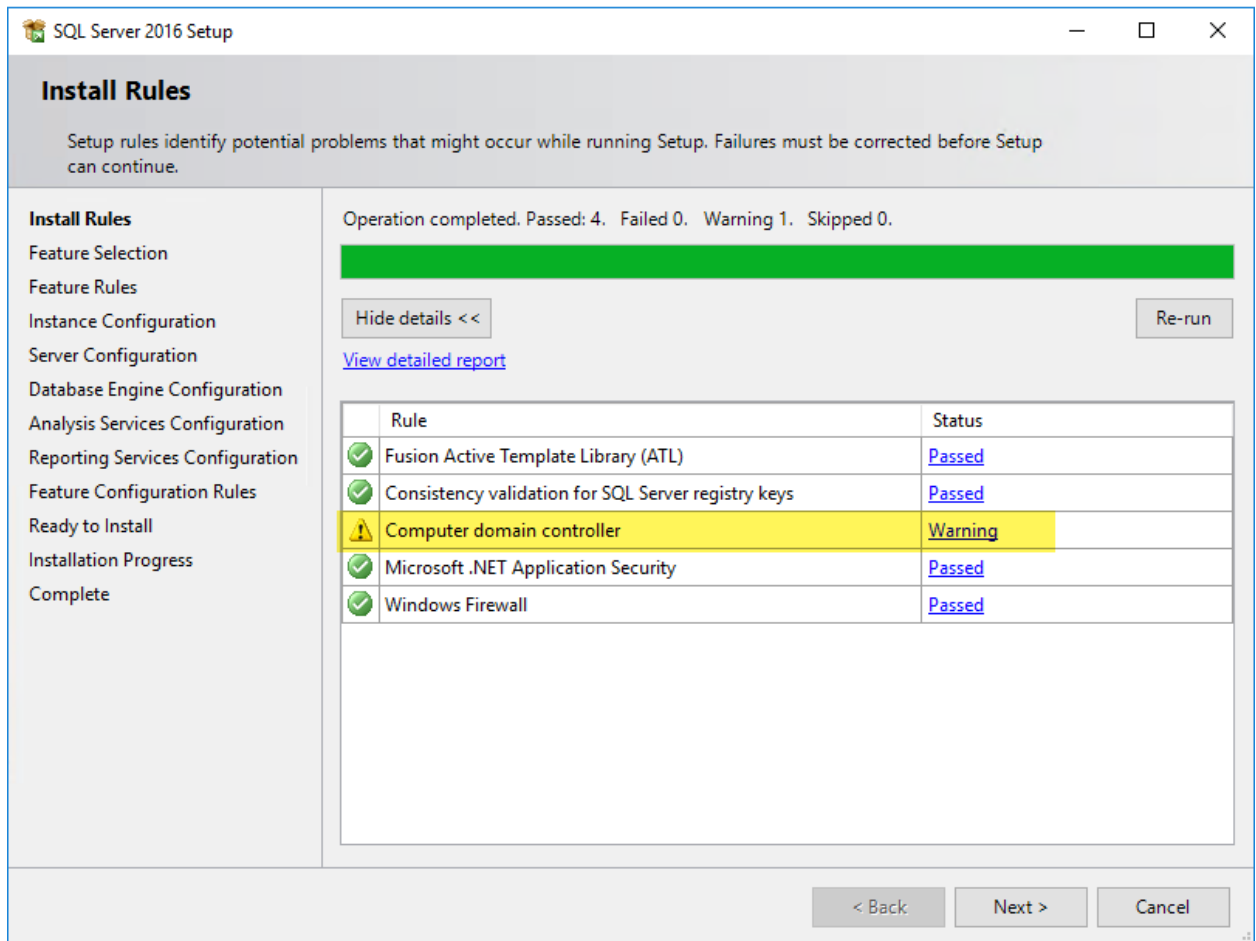
12. In the **Microsoft Update** dialog box, click **Next**.





If you encounter a Product Updates dialog box, click Next.

13. When the **Install Rules** dialog box opens, ignore the **Computer domain controller Warning**, then click **Next**.



14. In the **Product Key** dialog box, verify **Evaluation** is selected, then click **Next**.

The screenshot shows the 'SQL Server 2016 Setup' window with the 'Product Key' tab selected. The left sidebar lists various setup steps, with 'Product Key' highlighted. The main area contains instructions on how to validate the installation and two options: 'Specify a free edition' (selected) and 'Enter the product key'. The 'Specify a free edition' option has a dropdown menu with 'Evaluation' selected. The 'Enter the product key' option has a text input field with a placeholder for a 25-character key. At the bottom right, there are buttons for '< Back', 'Next >', and 'Cancel'.

SQL Server 2016 Setup

Product Key

Specify the edition of SQL Server 2016 to install.

Global Rules
Microsoft Update
Product Updates
Install Setup Files
Install Rules
Product Key
License Terms
Feature Selection
Feature Rules
Feature Configuration Rules
Ready to Install
Installation Progress
Complete

Validate this instance of SQL Server 2016 by entering the 25-character key from the Microsoft certificate of authenticity or product packaging. You can also specify a free edition of SQL Server: Developer, Evaluation, or Express. Evaluation has the largest set of SQL Server features, as documented in SQL Server Books Online, and is activated with a 180-day expiration. Developer edition does not have an expiration, has the same set of features found in Evaluation, but is licensed for non-production database application development only. To upgrade from one installed edition to another, run the Edition Upgrade Wizard.

☒ Specify a free edition:

Evaluation

☐ Enter the product key:

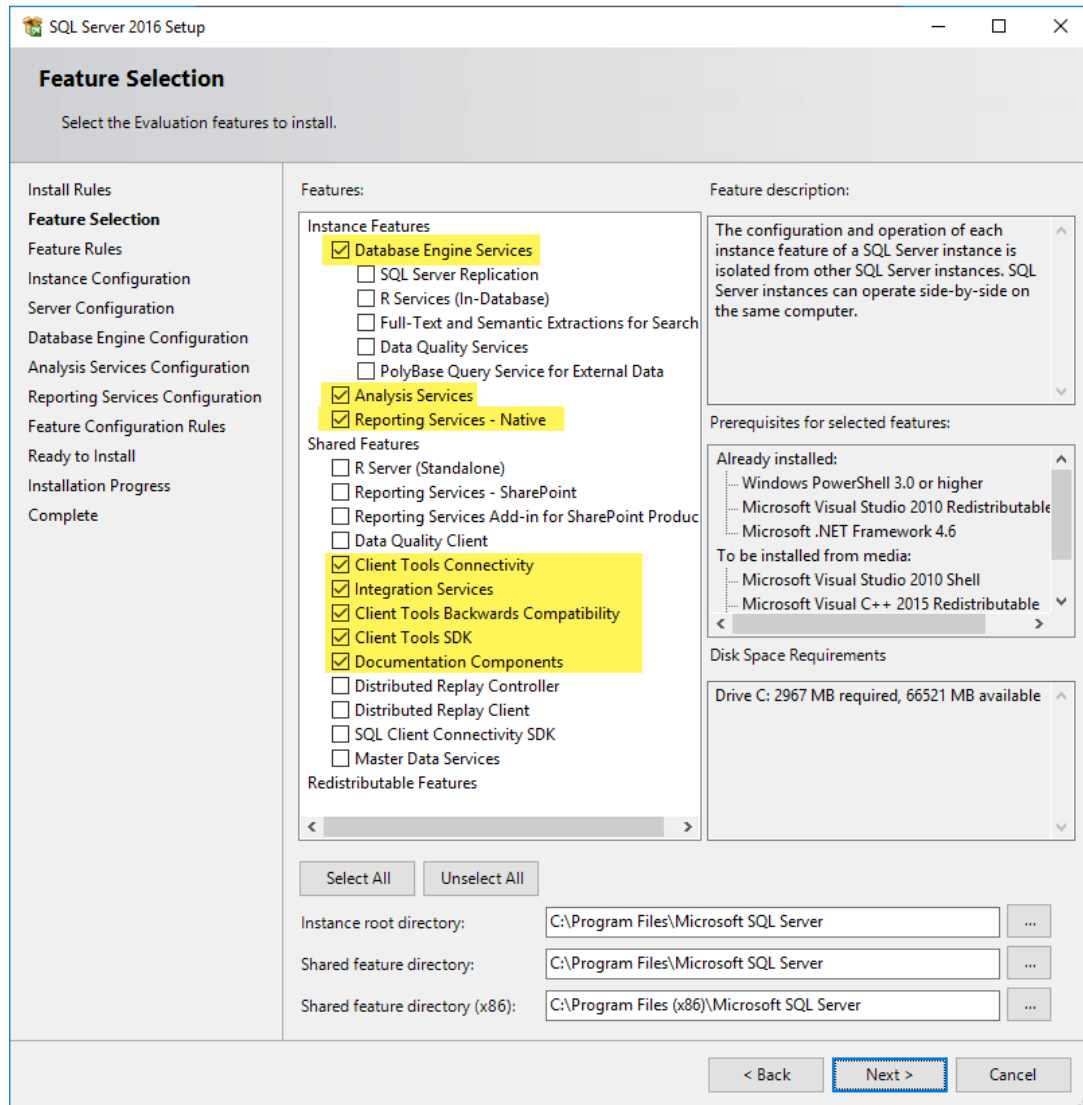
____-____-____-____-____

< Back Next > Cancel

15. In the **License Terms** dialog box, place a check in the **I accept the license terms** check box and click **Next**.

16. In the **Feature Selection** dialog box, place a check in the following check boxes:

- Database Engine Services
- Analysis Services
- Reporting Services – Native
- Client Tools Connectivity
- Integration Services
- Client Tools Backwards Compatibility
- Client Tools SDK
- Documentation Components



17. Click **Next**.
18. In the **Instance Configuration** dialog box, leave the **Default instance** settings as they are, and click **Next**.

☒ **Default instance**
☐ **Named instance:** MSSQLSERVER

Instance ID: MSSQLSERVER

SQL Server directory: C:\Program Files\Microsoft SQL Server\MSSQL13.MSSQLSERVER
Analysis Services directory: C:\Program Files\Microsoft SQL Server\MSAS13.MSSQLSERVER
Reporting Services directory: C:\Program Files\Microsoft SQL Server\MSRS13.MSSQLSERVER

19. In the **Server Configuration** dialog box, move to the **SQL Server Analysis Services** row, click into the empty **Account Name** text box, use the corresponding drop-down arrow, then click <<**Browse...**>>.
20. In the **Select Users, Computers, Service Accounts, or Groups** dialog box, move to the **Enter the object names to select** text box and enter **SQLDb**.

Select Users, Computers, Service Accounts, or Groups

Select this object type:
 Users, Service Accounts, Groups, or Built-in security principals
 Object Types...

From this location:
 Entire Directory
 Locations...

Enter the object names to select (examples):
 SQLDb
 Check Names

Advanced... OK Cancel

21. Click **Check Names** and notice **SQLDb** is now underlined.
22. Click **OK**.
23. Click into the corresponding empty **Password** text box and enter **Passw0rd**.



In Passw0rd, the 0 is numeric.

Service Accounts Collation

Microsoft recommends that you use a separate account for each SQL Server service.

Service	Account Name	Password	Startup Type
SQL Server Agent	NT Service\SQLSERVERA...		Manual
SQL Server Database Engine	NT Service\MSSQLSERVER		Automatic
SQL Server Analysis Services	RonsNotes\SQLDb	Passw0rd	Automatic
SQL Server Reporting Services	NT Service\ReportServer		Automatic
SQL Server Integration Services 13.0	NT Service\MsDtsServer...		Automatic
SQL Server Browser	NT AUTHORITY\LOCAL ...		Disabled

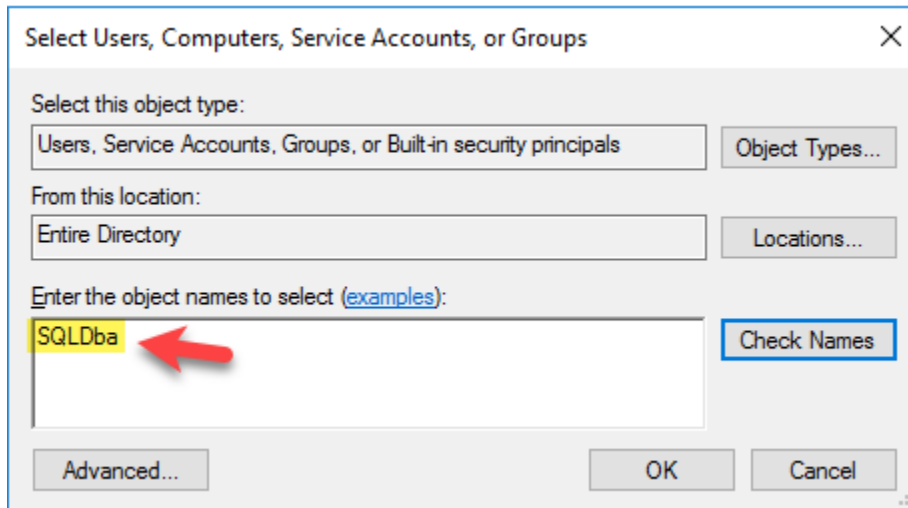
☐ Grant Perform Volume Maintenance Task privilege to SQL Server Database Engine Service

This privilege enables instant file initialization by avoiding zeroing of data pages. This may lead to information disclosure by allowing deleted content to be accessed.

[Click here for details](#)

24. Click **Next**.
25. In the **Database Engine Configuration** dialog box, review the current settings.
26. Click **Add Current User**.
27. Notice you now see **RONSNOTES\Student (Student)** listed in the **Specify SQL Server administrators** text box.

28. Click **Add...**
29. In the **Select Users, Computers, Service Accounts, or Groups** dialog box, move to the **Enter the object names to select** text box and enter SQLDb.

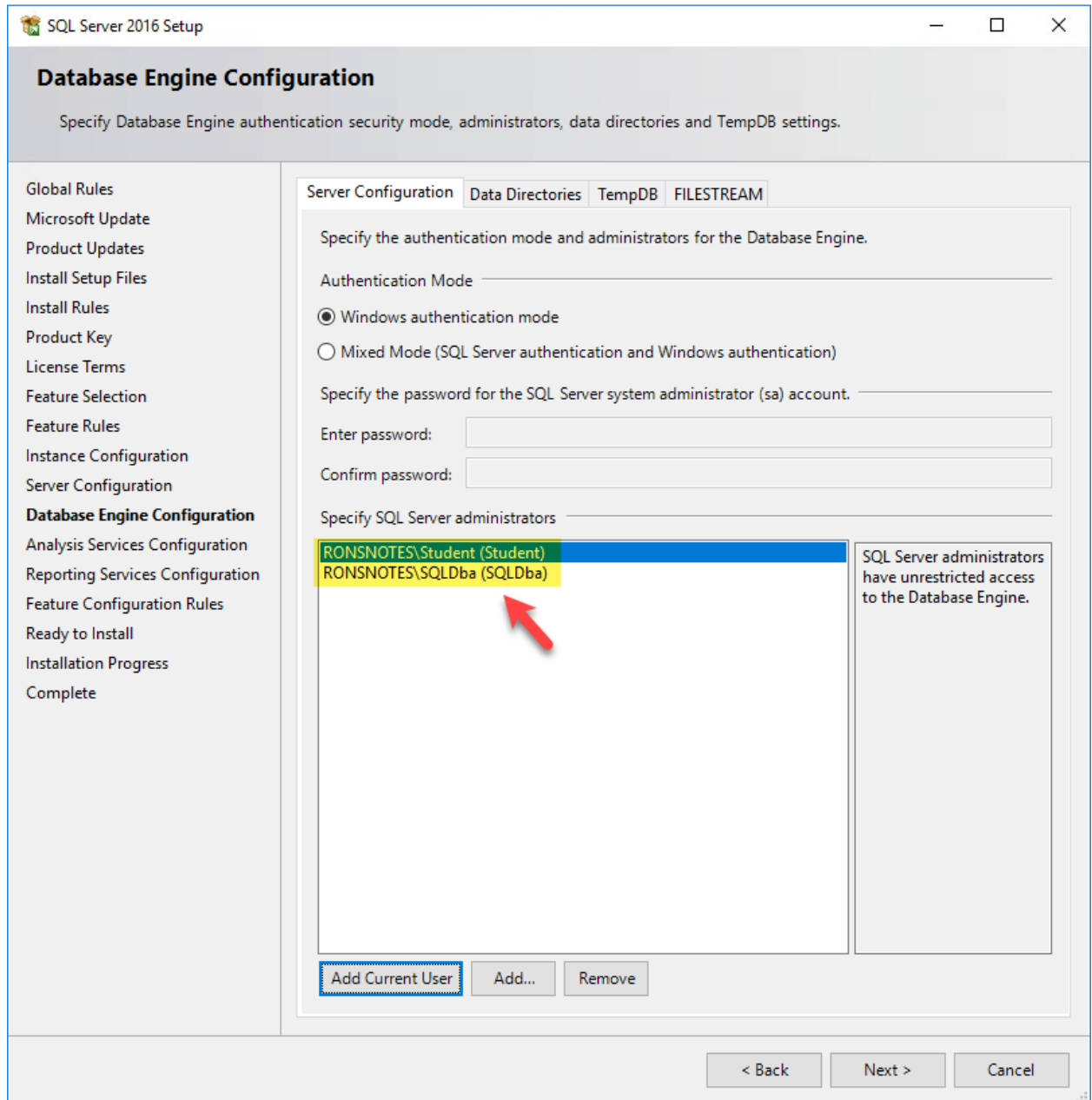


30. Click **Check Names** and notice SQLDb is now underlined.
31. Click **OK**.

32. Notice you now see **RONSNOTES\SQLDb (SQLDb)** listed in the **Specify SQL Server administrators** text box.

At this point you should show two administrators:

- *RONSNOTES\Student (Student)*
- *RONSNOTES\SQLDb (SQLDb)*



33. Click **Next**.

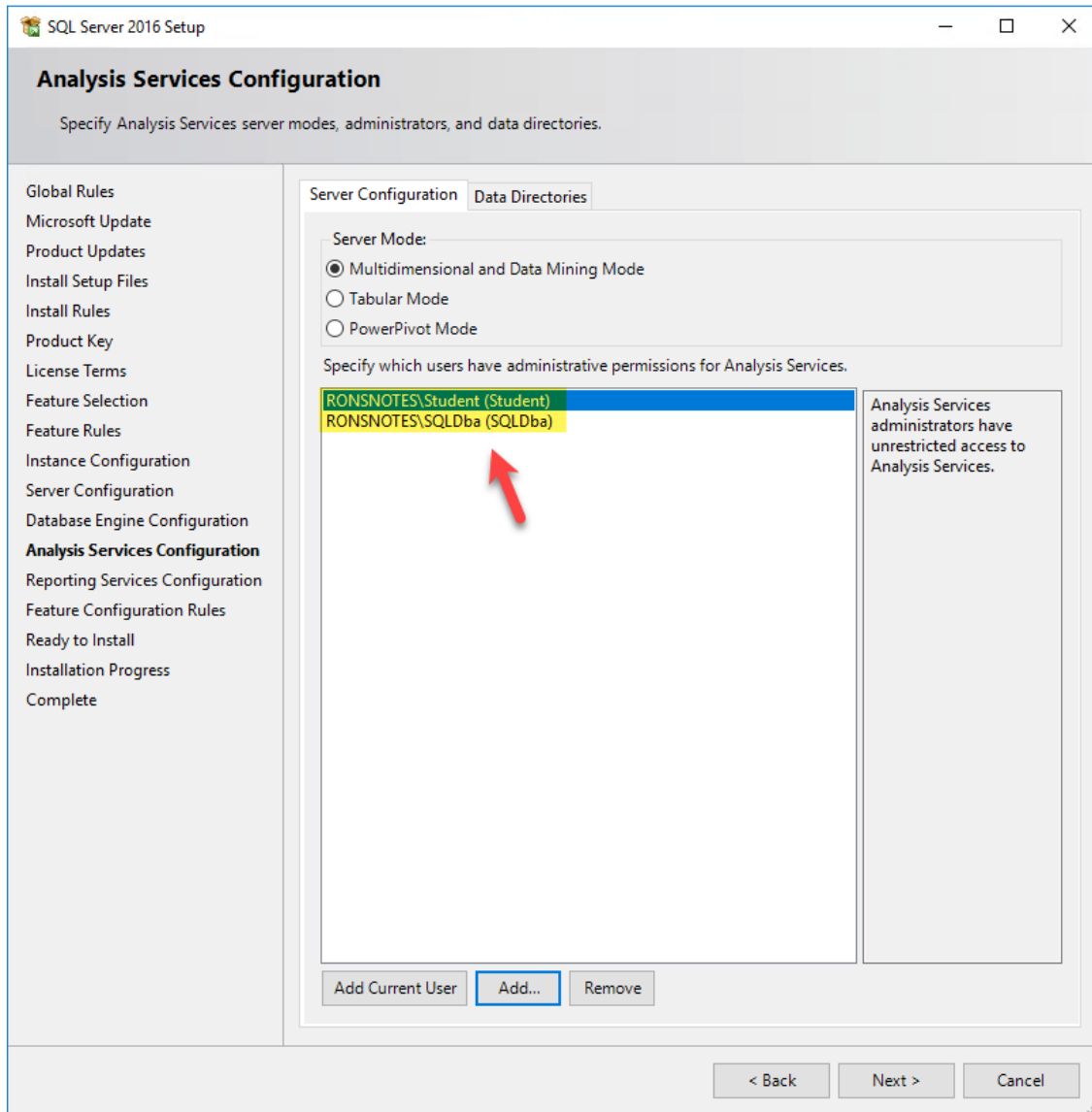
34. In the **Analysis Service Configuration** dialog box, review the current settings.

35. Click **Add Current User**.

36. Notice you now see **RONSNOTES\Student (Student)** listed in the **Specify which users have administrative permissions for Analysis Services** text box.

37. Click **Add...**

38. In the **Select Users, Computers, Service Accounts, or Groups** dialog box, move to the **Enter the object names to select** text box and enter **SQLDb**.
39. Click **Check Names** and notice **SQLDb** is now underlined.
40. Click **OK**.
41. Notice you now see **RONSNOTES\SQLDb (SQLDb)** listed in the **Specify which users have administrative permissions for Analysis Services** text box.
At this point you should show two administrators:
 - *RONSNOTES\Student (Student)*
 - *RONSNOTES\SQLDb (SQLDb)*



42. Click **Next**.

43. In the **Reporting Services Configuration** dialog box, review the settings, then click **Next**.

Reporting Services Native Mode

☒ Install and configure.
Installs and configures the report server in native mode. The report server is operational after setup completes.

☐ Install only.
Installs the report server files. After installation, use Reporting Services Configuration Manager to configure the report server for native mode.

Reporting Services SharePoint Integrated Mode

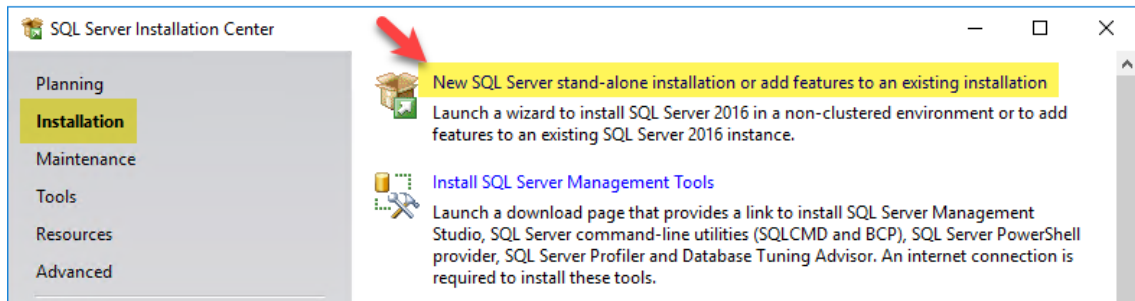
☐ Install only.
Installs the report server files. After installation use SharePoint Central Administration to complete the configuration. Verify the SQL Server Reporting Services service is started and create at least one SQL Server Reporting Services service application. For more information, click Help.

44. Click **Next**.
45. In the **Ready to Install** dialog box, click **Install**.
46. Upon **Success**, click **Close**.
47. Using **Hyper-V Manager**, shut down and restart the VM.
48. Double-click the VM to connect.
49. Open **File Explorer** and double-click the drive containing **SQL2016_x64_ENU**.
50. Double-click **setup**.

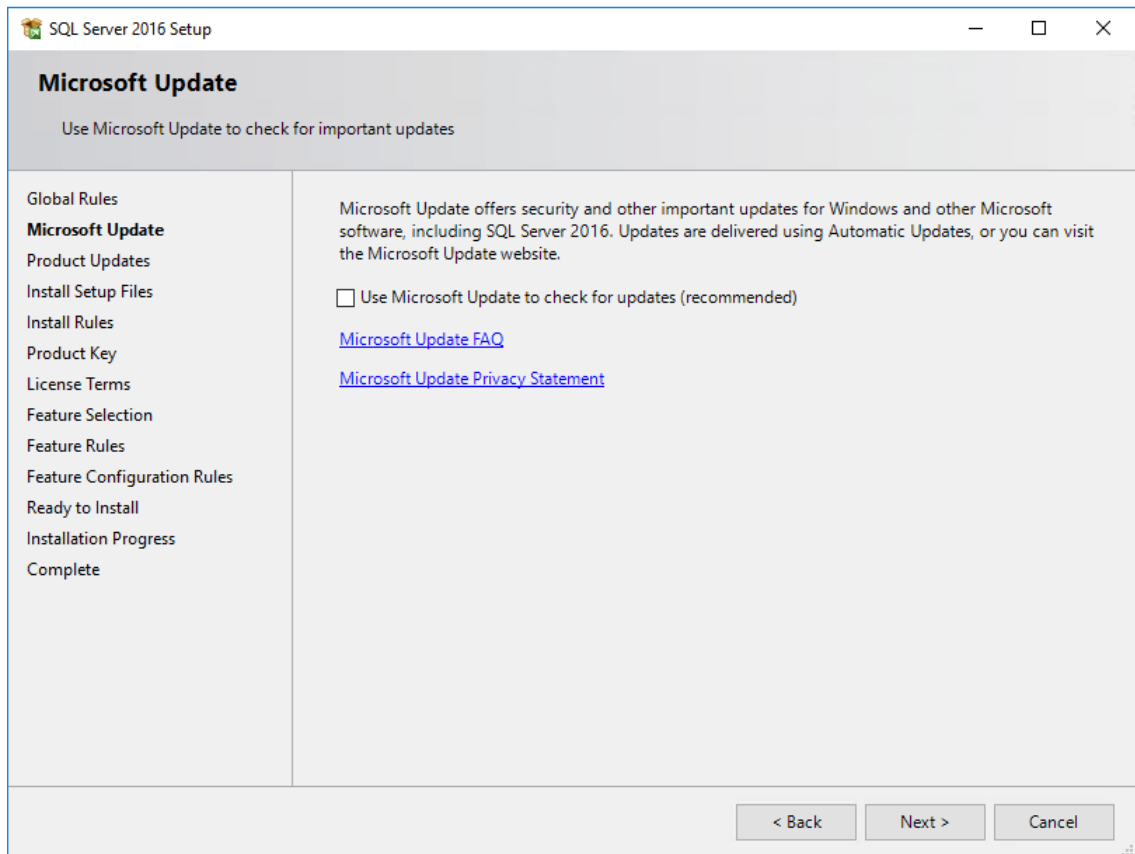
Name	Date modified	Type
1033_ENU_LP	5/3/2016 4:05 PM	File folder
redist	5/3/2016 4:10 PM	File folder
resources	5/3/2016 4:10 PM	File folder
Tools	5/3/2016 4:10 PM	File folder
x64	5/3/2016 4:10 PM	File folder
autorun	2/9/2016 7:38 PM	Setup Information
MedialInfo	4/30/2016 9:13 PM	XML Document
setup	4/30/2016 9:12 AM	Application
setup.exe.config	2/9/2016 7:34 PM	CONFIG File
SqlSetupBootstrapper.dll	4/30/2016 9:12 AM	Application extens...
sqmapi.dll	4/30/2016 9:12 AM	Application extens...

51. In the **User Account Control** dialog box, click **Yes**.
52. In **SQL Server Installation Center**, click **Installation** tab.

53. Click the link for a **New SQL Server stand-alone installation or add features to an existing installation**.



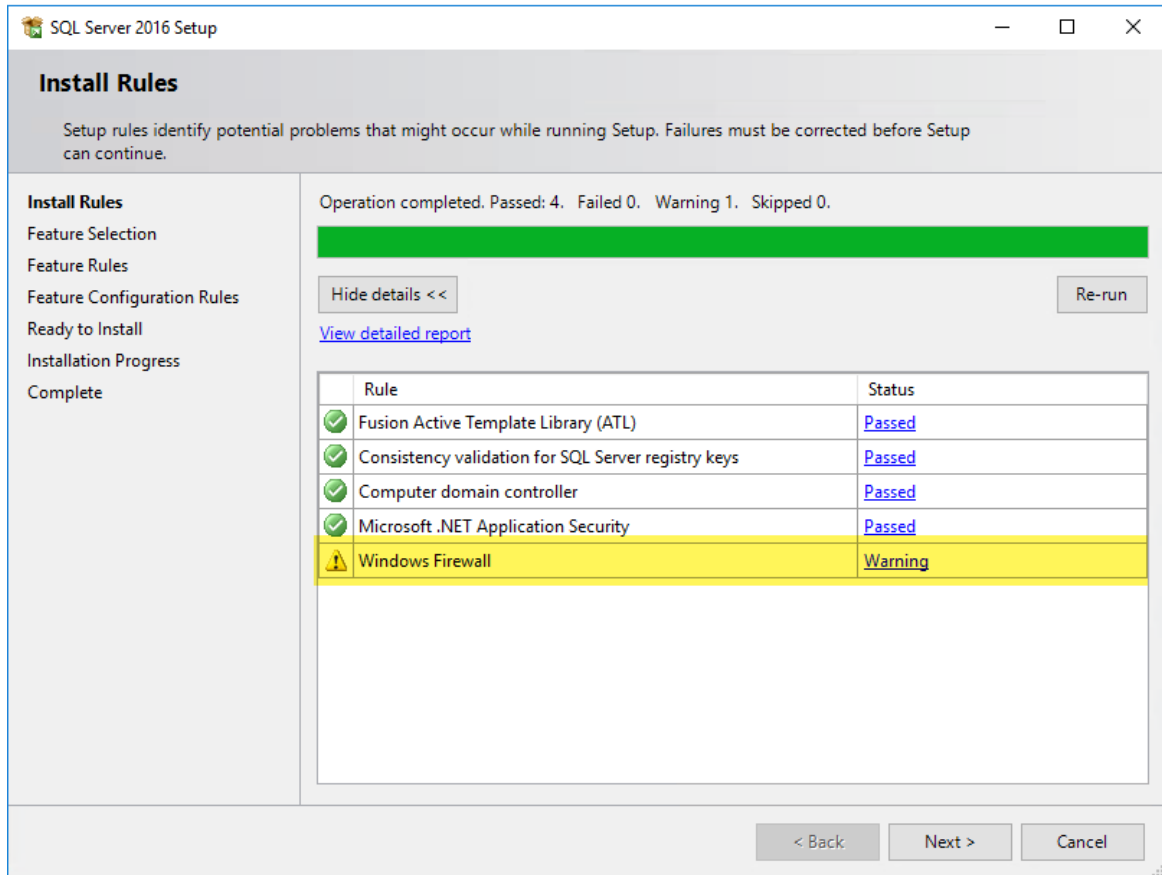
54. In the **Microsoft Update** dialog box, click **Next**.





If you encounter a Product Updates dialog box, click Next.

55. When the **Install Rules** dialog box opens, ignore the **Windows Firewall Warning**, then click **Next**.



56. In the **Installation Type** dialog box, click **Next**.

SQL Server 2016 Setup

Installation Type

Perform a new installation or add features to an existing instance of SQL Server 2016.

☒ Perform a new installation of SQL Server 2016
Select this option if you want to install a new instance of SQL Server or want to install shared components.

☐ Add features to an existing instance of SQL Server 2016
MSSQLSERVER
Select this option if you want to add features to an existing instance of SQL Server. For example, you want to add the Analysis Services features to the instance that contains the Database Engine. Features within an instance must be the same edition.

Installed instances:

Instance Name	Instance ID	Features	Edition	Version
MSSQLSERVER	MSSQL13.MSSQLS...	SQLEngine,AS,RS	Evaluation	13.0.1601.5
<Shared Compone...		Conn, BC, SDK		13.0.14500.10
<Shared Compone...		IS		13.0.1601.5

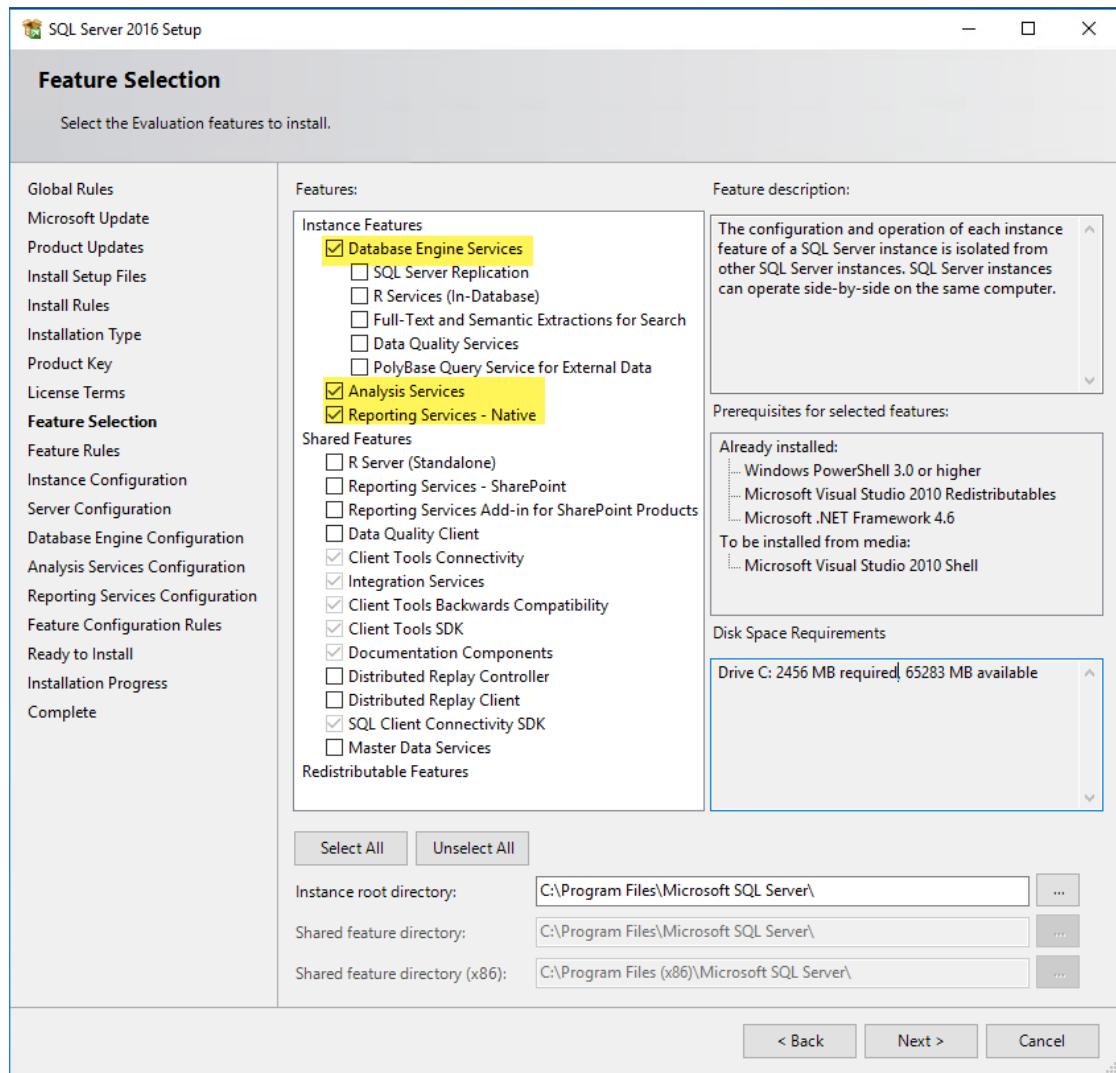
< Back Next > Cancel

57. In the **Product Key** dialog box, click **Next**.

58. In the **License Terms** dialog box, place a check in the **I accept the license terms** check box and click **Next**.

59. In the **Feature Selection** dialog box, place a check in the following check boxes:

- Database Engine Services
- Analysis Services
- Reporting Services – Native



60. Click **Next**.

61. In the **Instance Configuration** dialog box, move to the **Named instance** text box and enter **INSTANCE2**.

62. In the **Instance ID** text box, enter **INSTANCE2** and then click **Next**.

☐ Default instance
☒ Named instance:

Instance ID:

SQL Server directory: C:\Program Files\Microsoft SQL Server\MSSQL13.INSTANCE2
 Analysis Services directory: C:\Program Files\Microsoft SQL Server\MSAS13.INSTANCE2
 Reporting Services directory: C:\Program Files\Microsoft SQL Server\MSRS13.INSTANCE2

63. In the **Server Configuration** dialog box, click **Next**.
64. In the **Select Users, Computers, Service Accounts, or Groups** dialog box, move to the **Enter the object names to select** text box and enter **SQLDb**.

Select Users, Computers, Service Accounts, or Groups ✕

Select this object type:

From this location:

Enter the object names to select (examples):

65. Click **Check Names** and notice SQLDb is now underlined.
66. Click **OK**.

67. Click into the corresponding empty **Password** text box and enter **Passw0rd**.



In Passw0rd, the 0 is numeric.

Service	Account Name	Password	Startup Type
SQL Server Agent	NT Service\SQLSERVERA...		Manual
SQL Server Database Engine	NT Service\MSSQLSERVER		Automatic
SQL Server Analysis Services	RonsNotes\SQLDb	Automatic
SQL Server Reporting Services	NT Service\ReportServer		Automatic
SQL Server Integration Services 13.0	NT Service\MsDtsServer...		Automatic
SQL Server Browser	NT AUTHORITY\LOCAL ...		Disabled

☐ Grant Perform Volume Maintenance Task privilege to SQL Server Database Engine Service

This privilege enables instant file initialization by avoiding zeroing of data pages. This may lead to information disclosure by allowing deleted content to be accessed.

[Click here for details](#)

68. Click **Next**.

69. In the **Database Engine Configuration** dialog box, review the current settings.

70. Click **Add Current User**.

71. Notice you now see **RONSNOTES\Student (Student)** listed in the **Specify SQL Server administrators** text box.

72. Click **Add...**

73. In the **Select Users, Computers, Service Accounts, or Groups** dialog box, move to the **Enter the object names to select** text box and enter **SQLDb**.

Select Users, Computers, Service Accounts, or Groups

Select this object type:
Users, Service Accounts, Groups, or Built-in security principals

From this location:
Entire Directory

Enter the object names to select (examples):
SQLDb

Check Names

Advanced... OK Cancel

74. Click **Check Names** and notice **SQLDb** is now underlined.

75. Click **OK**.

76. Notice you now see **RONSNOTES\SQLDbA (SQLDbA)** listed in the **Specify SQL Server administrators** text box.

At this point you should show two administrators:

- *RONSNOTES\Student (Student)*
- *RONSNOTES\SQLDbA (SQLDbA)*

SQL Server 2016 Setup

Database Engine Configuration

Specify Database Engine authentication security mode, administrators, data directories and TempDB settings.

Global Rules
Microsoft Update
Product Updates
Install Setup Files
Install Rules
Product Key
License Terms
Feature Selection
Feature Rules
Instance Configuration
Server Configuration
Database Engine Configuration
Analysis Services Configuration
Reporting Services Configuration
Feature Configuration Rules
Ready to Install
Installation Progress
Complete

Server Configuration | Data Directories | TempDB | FILESTREAM

Specify the authentication mode and administrators for the Database Engine.

Authentication Mode

☒ Windows authentication mode
☐ Mixed Mode (SQL Server authentication and Windows authentication)

Specify the password for the SQL Server system administrator (sa) account.

Enter password:
Confirm password:

Specify SQL Server administrators

RONSNOTES\Student (Student)
RONSNOTES\SQLDbA (SQLDbA)

SQL Server administrators have unrestricted access to the Database Engine.

Add Current User Add... Remove

< Back Next > Cancel

77. Click **Next**.

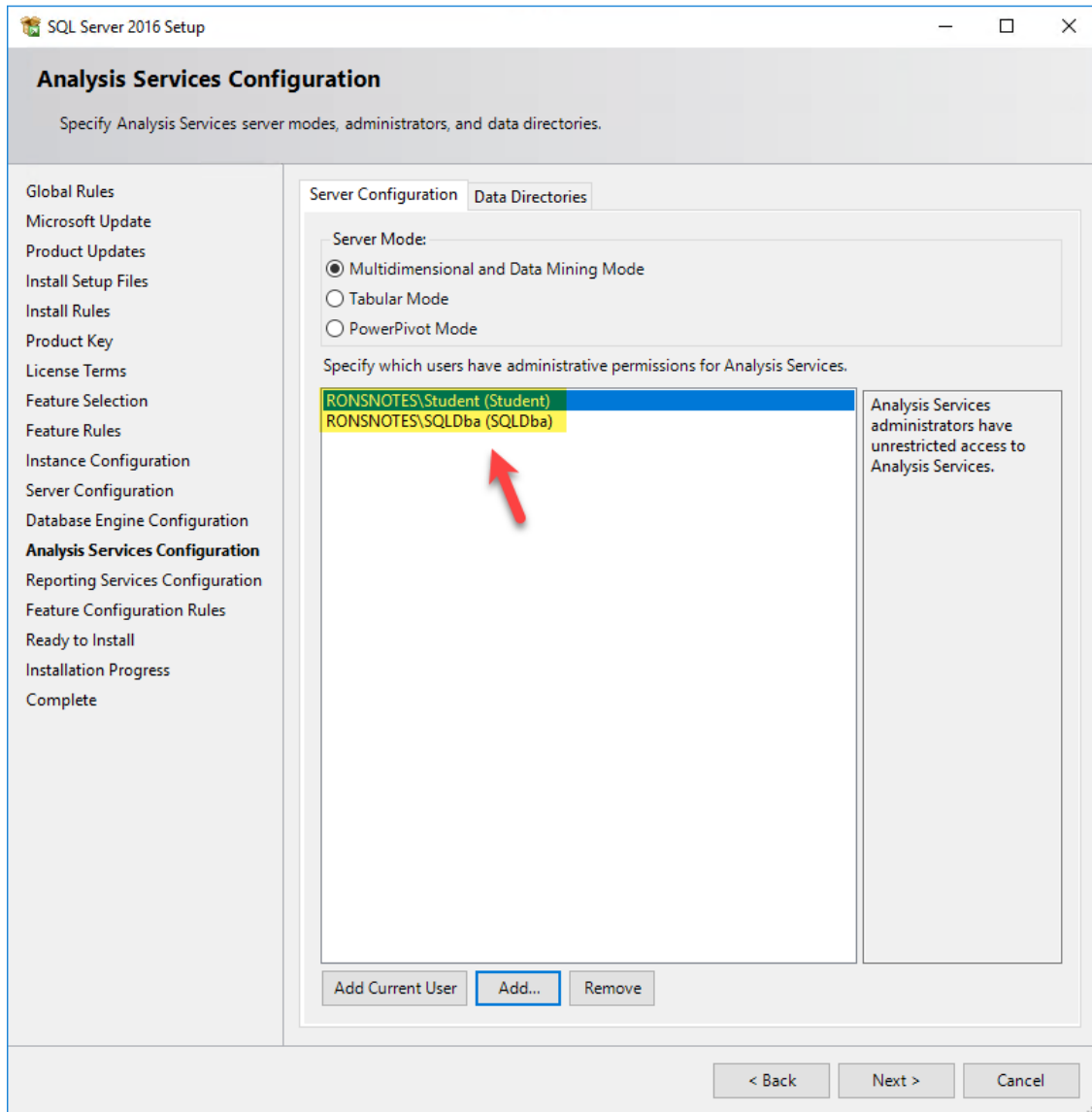
78. In the **Analysis Service Configuration** dialog box, review the current settings.

79. Click **Add Current User**.

80. Notice you now see **RONSNOTES\Student (Student)** listed in the **Specify which users have administrative permissions for Analysis Services** text box.

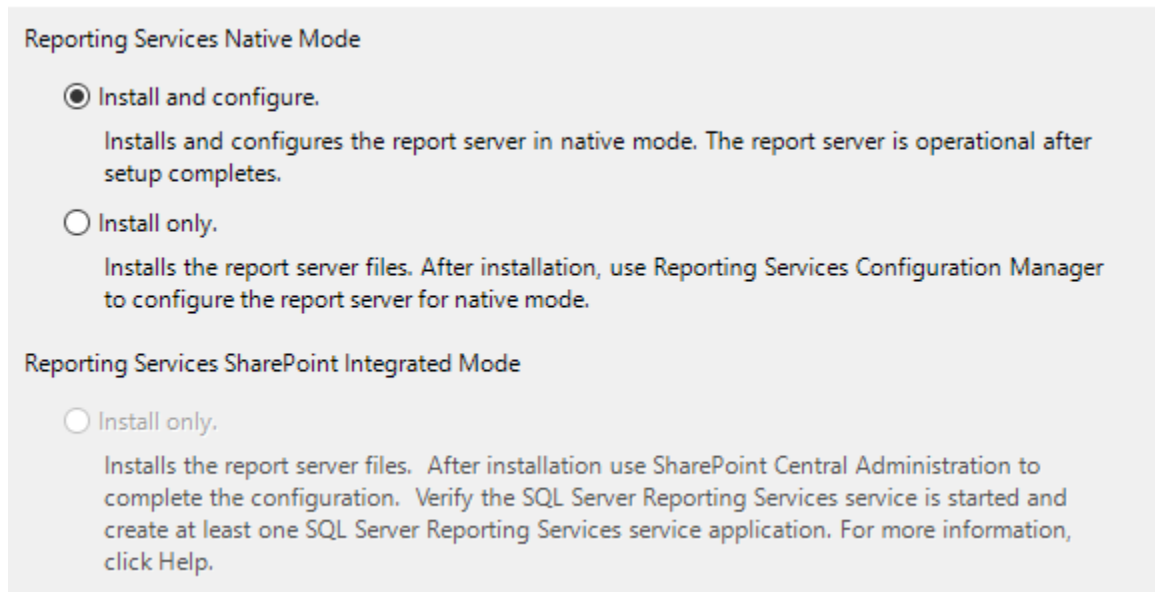
81. Click **Add...**

82. In the **Select Users, Computers, Service Accounts, or Groups** dialog box, move to the **Enter the object names to select** text box and enter **SQLDb**.
83. Click **Check Names** and notice **SQLDb** is now underlined.
84. Click **OK**.
85. Notice you now see **RONSNOTES\SQLDb (SQLDb)** listed in the **Specify which users have administrative permissions for Analysis Services** text box.
At this point you should show two administrators:
 - *RONSNOTES\Student (Student)*
 - *RONSNOTES\SQLDb (SQLDb)*



86. Click **Next**.

87. In the **Reporting Services Configuration** dialog box, review the settings, then click **Next**.



The image shows a screenshot of the 'Reporting Services Configuration' dialog box. It has two main sections: 'Reporting Services Native Mode' and 'Reporting Services SharePoint Integrated Mode'. Under 'Native Mode', there are two radio buttons: 'Install and configure.' (which is selected) and 'Install only.'. Below each radio button is a descriptive paragraph. Under 'SharePoint Integrated Mode', there is one radio button: 'Install only.', also with a descriptive paragraph below it.

Reporting Services Native Mode

☒ **Install and configure.**
Installs and configures the report server in native mode. The report server is operational after setup completes.

☐ **Install only.**
Installs the report server files. After installation, use Reporting Services Configuration Manager to configure the report server for native mode.

Reporting Services SharePoint Integrated Mode

☐ **Install only.**
Installs the report server files. After installation use SharePoint Central Administration to complete the configuration. Verify the SQL Server Reporting Services service is started and create at least one SQL Server Reporting Services service application. For more information, click Help.

88. Click **Next**.

89. In the **Ready to Install** dialog box, click **Install**.

90. Upon **Success**, click **Close**.

91. Using **Hyper-V Manager**, shut down and restart the VM.

92. Double-click the VM to connect.

93. Open **File Explorer** and double-click the drive containing **SQL2016_x64_ENU**.

94. Double-click **setup**.

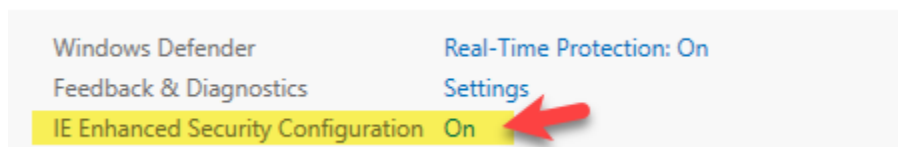
95. In the **User Account Control** dialog box, click **Yes**.

96. In **SQL Server Installation Center**, click **Installation** tab.

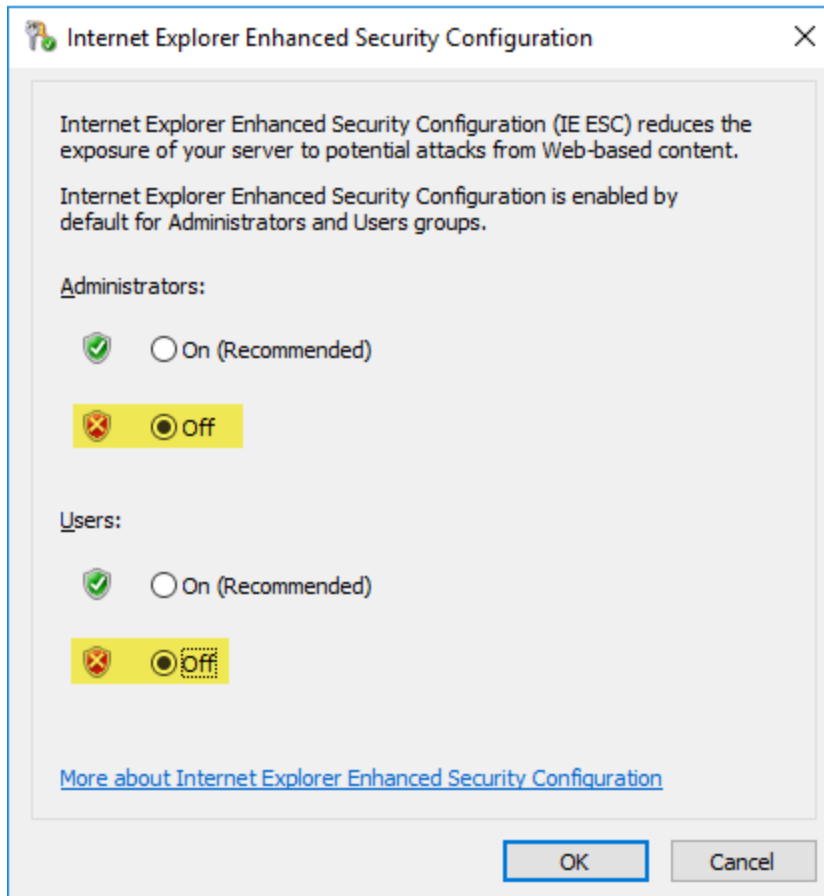
Task: Install SQL Server Management Studio

There is no PowerShell script equivalent to this task.

1. Switch to **Server Manager**.
2. Navigate to the pane on the left and click to select the **Local Server** tab.
3. Locate the **IE Enhanced Security Configuration** setting and click the corresponding **On** link.



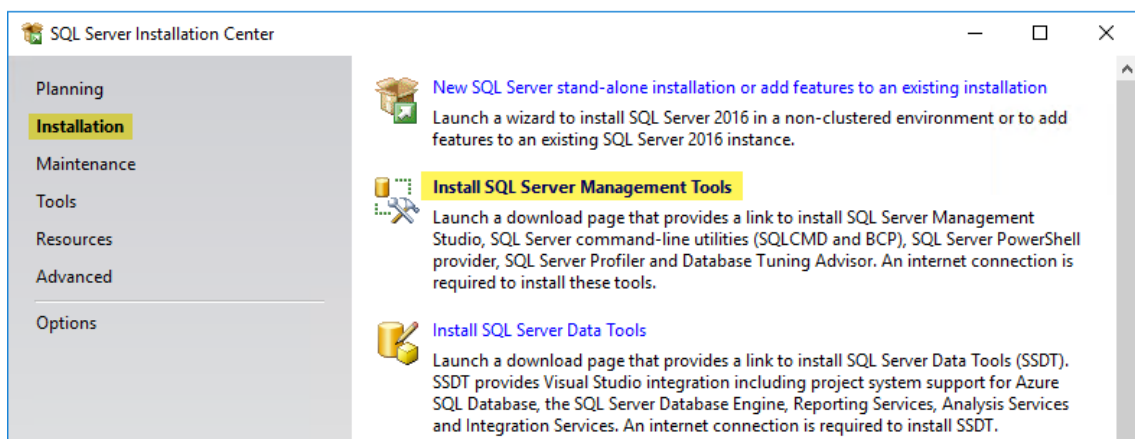
4. Click the **Off** radio button for both **Administrators** and **Users**.



5. Click **OK**.
6. Switch back to the **SQL Server Installation Center**, move to the pane on the left and click **Installation**.
7. Click **Install SQL Server Management Tools** link.

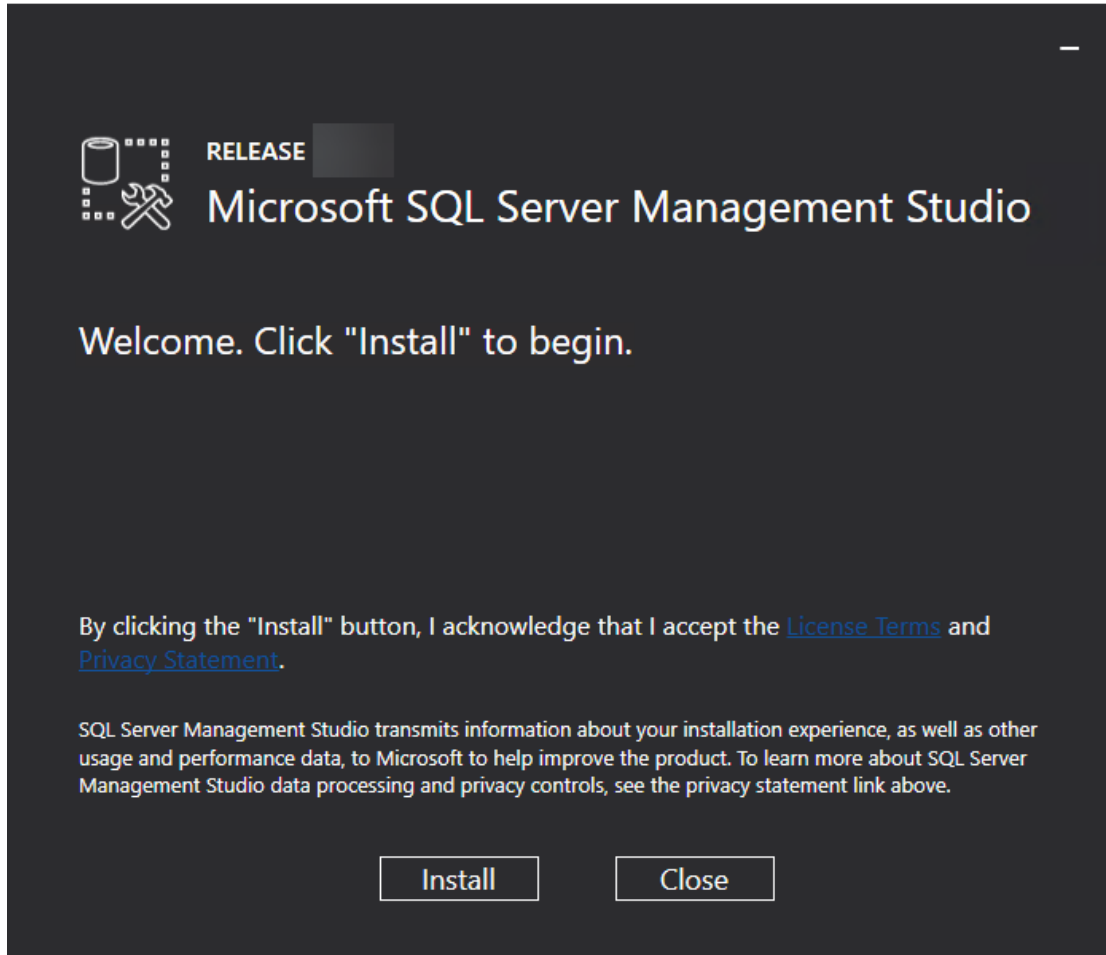


If you receive the Internet Explorer settings dialog box, move the radio button to Don't use recommended settings and click OK.

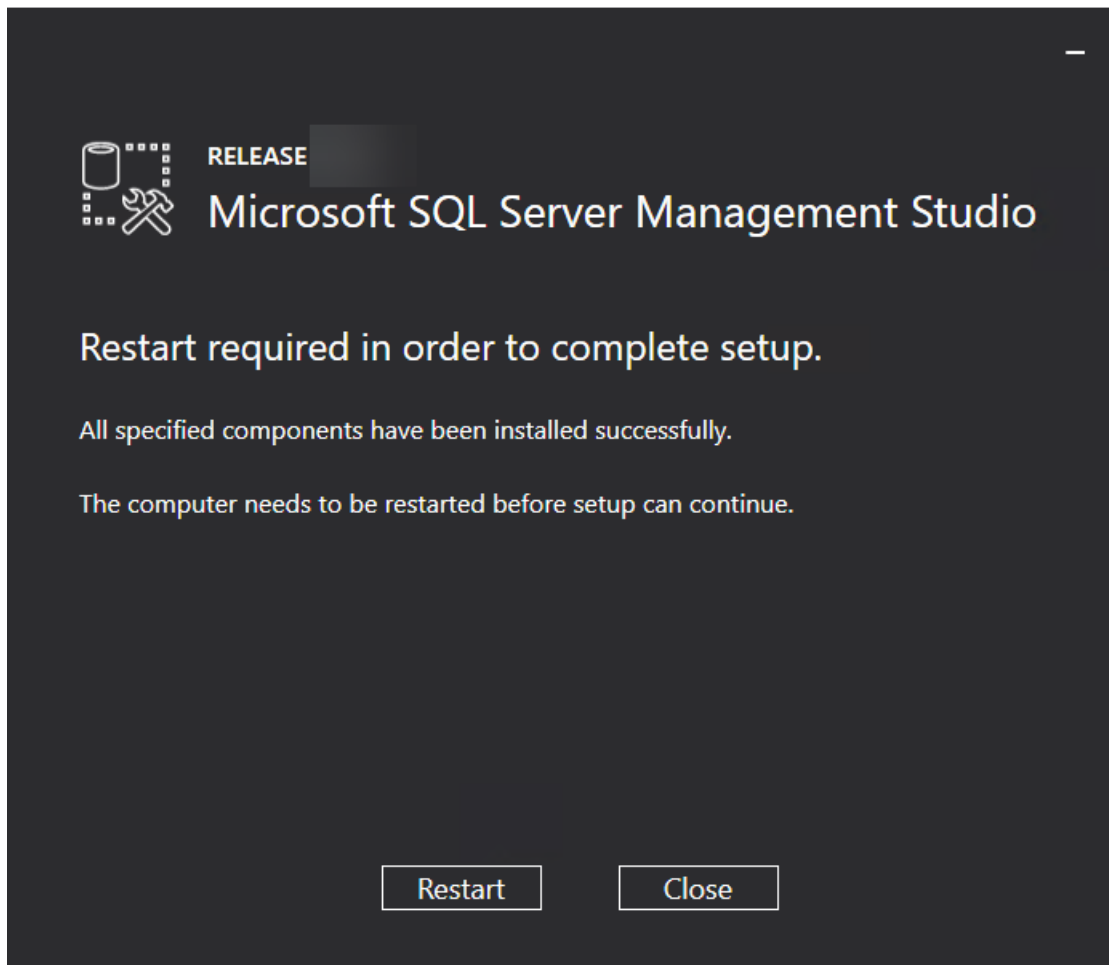


8. Click the **Download SQL Server Management Studio (Current release for production use)** link.

9. In the prompt below asking **Do you want to run or save SSMS-Setup-ENU.exe**, click **Save** (just in case).
10. Wait for the download to complete.
11. Once the download completes, move to the **SSMS-Setup-ENU.exe download has completed** prompt, and click **Run**.
12. In the **Welcome** dialog box, review the information, then click **Install**.

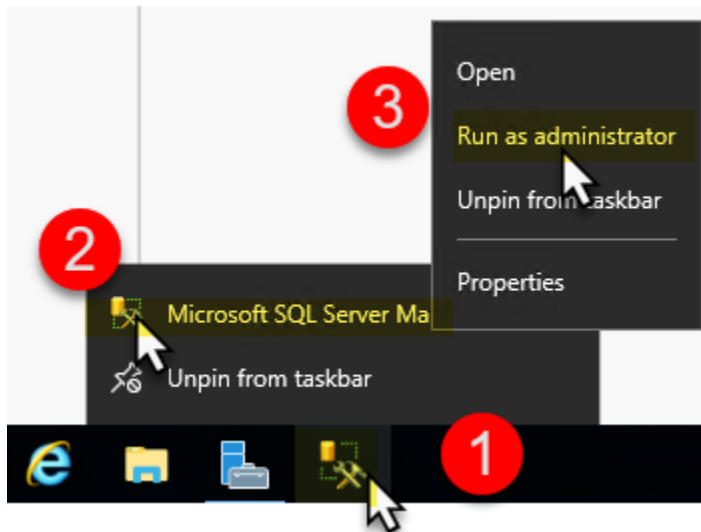


13. Once the installation completes, you will see a **Restart required in order to complete setup** dialog box, then click **Restart**.

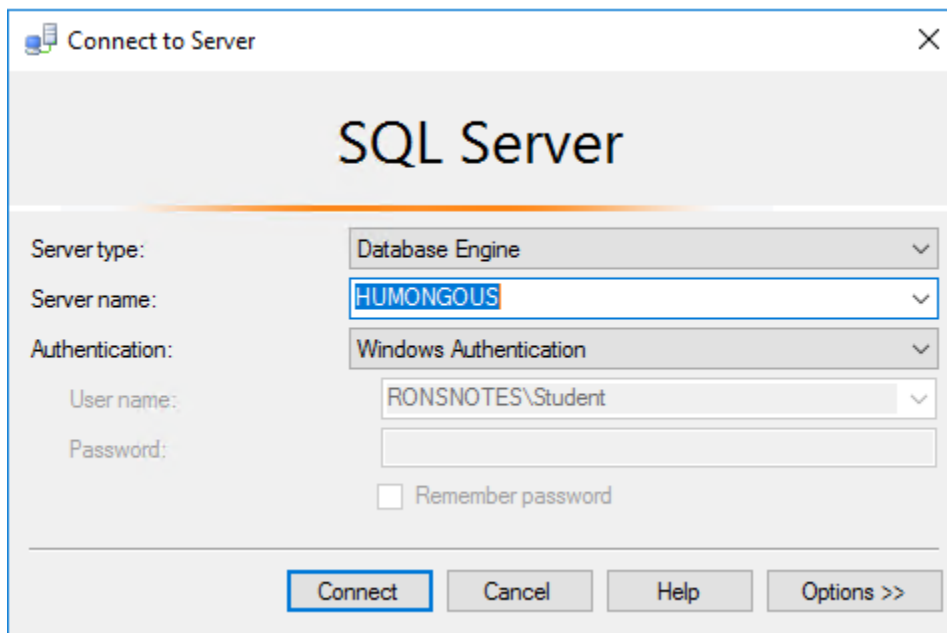


14. When the virtual machine comes back up, click **Other user** in the lower-left corner, then log in as **Student**.
15. Press the **Windows** key, then enter SQL.
16. Right-click **Microsoft SQL Server Management Studio**, then click **Pin to taskbar**.
17. Press **Esc** to return to desktop view.

18. Right-click the **Microsoft SQL Server Management Studio** icon in the taskbar, right-click the new **SQL Server Management Studio** icon showing, and click **Run as administrator**.

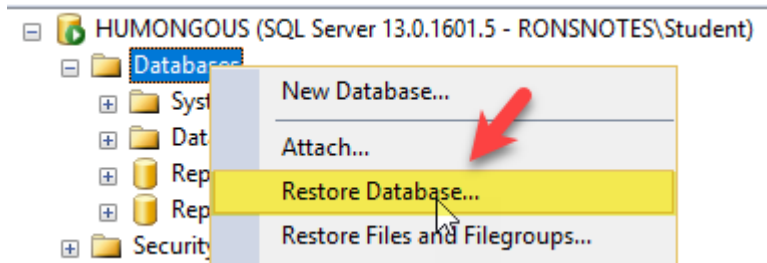


19. In the **User Account Control** dialog box, click **Yes**.
20. In the **Connect to Server** dialog box, review the current settings, then click **Connect**.

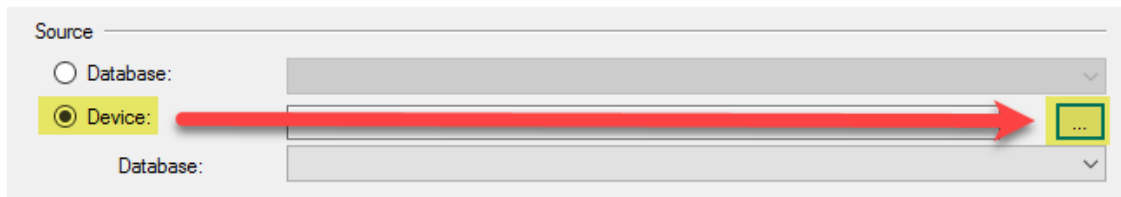


21. Minimize **Microsoft SQL Server Management Studio**.
22. Switch to your host machine and navigate to the downloaded database backup files (**DB Backups** folder).
23. Right-click the **DB Backups** folder, then click **Copy**.
24. Switch to **Humongous** virtual machine.
25. Open **File Explorer** and navigate to **C:**.
26. Paste in the **DB Backups** folder.
27. Double-click to open **DB Backups** folder.
28. Open a new instance of **File Explorer**, navigate to **C:\Program Files\Microsoft SQL Server\MSSQL13.MSSQLSERVER\MSSQL\Backup**.

29. In the **you don't currently have permission to access this folder** dialog box, click **Continue**.
30. Back in **DB Backups** folder, double-click to open the **Adventure Works 2014 Full Database Backup** folder.
31. Click to select **AdventureWorks2014.bak**, then right-click the file and click **Copy**.
32. Paste the files in **C:\Program Files\Microsoft SQL Server\MSSQL13.MSSQLSERVER\MSSQL\Backup**.
33. Switch back to **DB Backups** folder, double-click to open the **Adventure Works DW 2014 Full Database Backup** folder.
34. Click to select **AdventureworksDW2014.bak**, then right-click the file and click **Copy**.
35. Paste the files in **C:\Program Files\Microsoft SQL Server\MSSQL13.MSSQLSERVER\MSSQL\Backup**.
36. Switch back to **Microsoft SQL Server Management Studio**, navigate to the **Object Explorer** pane, right-click **Databases** and click **Restore Database ...**.

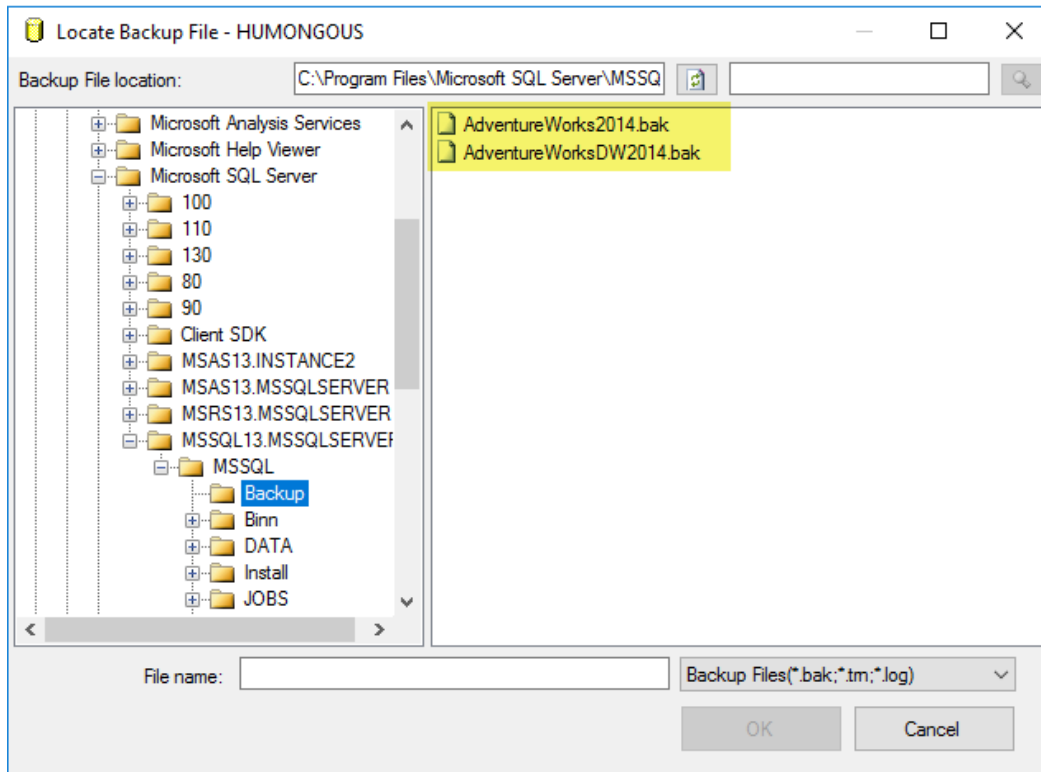


37. In the **Restore Database** dialog box, click the **Device** radio button and the corresponding ellipses.

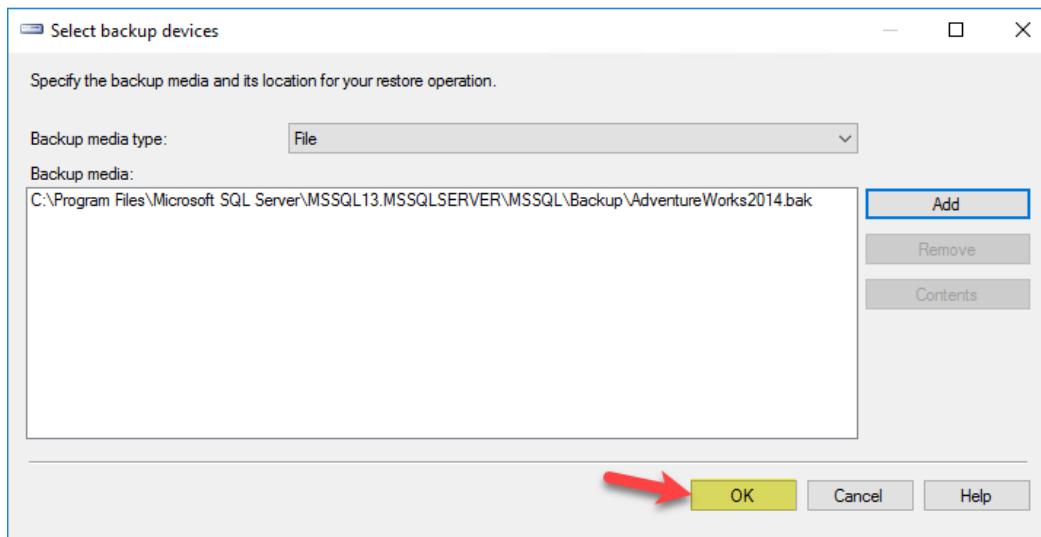


38. In the **Select backup devices** dialog box, click **Add**.

39. In the **Locate Backup File - HUMONGOUS** dialog box, notice both files are listed.

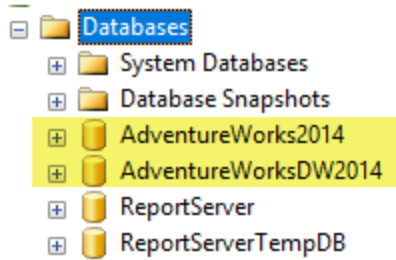


40. Double-click **AdventureWorks2014.bak** and in the **Select backup devices** dialog box, click **OK**.

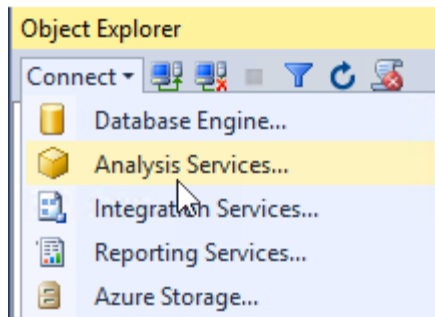


41. In the **Restore Database-AdventureWorks2014** dialog box, click **OK**.
42. In the dialog box stating **Database 'AdventureWorks2014' restored successfully**, click **OK**.
43. Move back to **Microsoft SQL Server Management Studio**, navigate to the **Object Explorer** pane, right-click **Databases** and click **Restore Database**
44. In the **Restore Database** dialog box, click the **Device** radio button and the corresponding ellipses.
45. In the **Select backup devices** dialog box, click **Add**.
46. In the **Locate Backup File - HUMONGOUS** dialog box, double-click **AdventureWorksDW2014**.

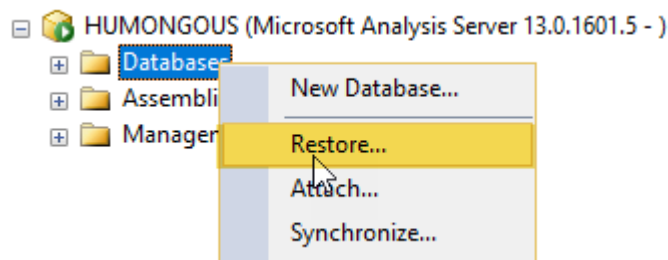
47. In the **Select backup devices** dialog box, click **OK**.
48. In the **Restore Database-AdventureWorksDW2014** dialog box, click **OK**.
49. In the dialog box stating **Database 'AdventureWorksDW2014' restored successfully**, click **OK**.
50. In the **Object Explorer** pane, expand **Databases** folder and notice you now see both databases listed.



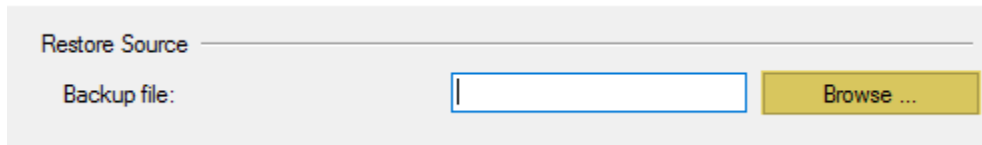
51. In a new instance of **File Explorer**, navigate to **C:\Program Files\Microsoft SQL Server\MSAS13.MSSQLSERVER\OLAP\Backup**.
52. In the **You don't currently have permission to access this folder** dialog box, click **Continue**.
53. Back in **C:\DB Backups**, double-click the **Adventure Works Multidimensional Model SQL 2014 Full Database Backups** folder.
54. Right-click **AdventureWorksDW2014Multidimensional-EE.abf** and click **Copy**.
55. Paste the file into **C:\Program Files\Microsoft SQL Server\MSAS13.MSSQLSERVER\OLAP\Backup**.
56. Switch back to **Microsoft SQL Server Management Studio** and in the **Object Explorer** pane, click **Connect**.
57. In the drop-down, click **Analysis Services...**



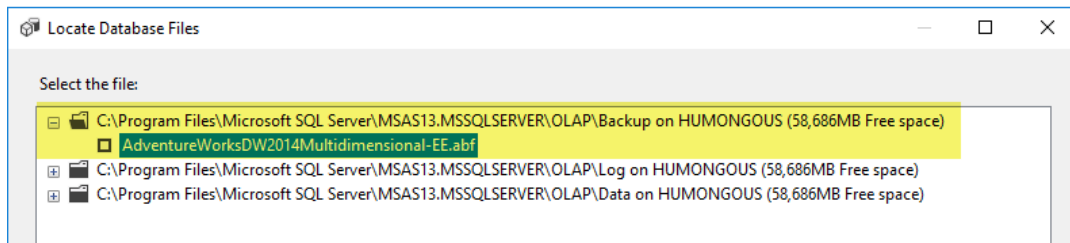
58. In the **Connect to Server** dialog box, click **Connect**.
59. In the **Object Explorer** pane, locate the **Databases** folder under **Humongous (Microsoft Analysis Services)**, right-click and click **Restore...**



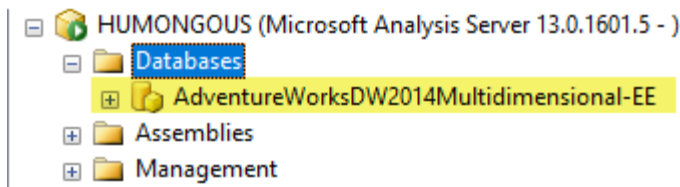
60. In the **Restore Database** dialog box, move to the **Restore Source** section and click the corresponding **Browse....**



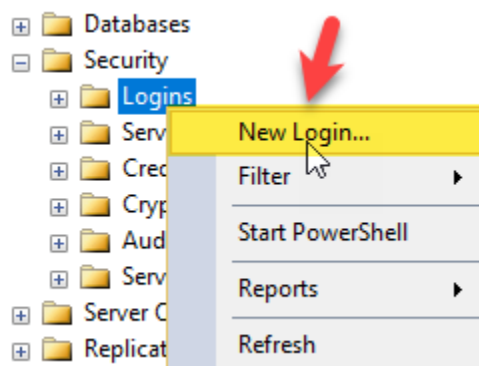
61. In the **Locate Database Files** dialog box, expand the first folder listed, double-click **AdventureWorksDW2014Multidimensional-EE.abf** and click **OK**.



62. Back in the **Restore Database** dialog box, click **OK**.
63. Upon completion (this may take some time), right-click **Databases** under **Humongous (Microsoft Analysis Services)**, and click **Refresh**.
64. Expand **Databases** under **Humongous (Microsoft Analysis Services)**, expand **AdventureWorksDW2014Multidimensional-EE.abf** and expand **Cubes**.
65. Notice **Adventure Works** is listed.



66.
67. In the **Object Explorer** pane on the left, expand **Security** folder.
68. Right-click **Logins** and click **New Login....**



69. In the **Login - New** dialog box, click **Search....**

Login - New

Select a page

- General
- Server Roles
- User Mapping
- Securables
- Status

Script Help

Login name: **Search...**

☒ Windows authentication
☐ SQL Server authentication

Password:
 Confirm password:
☐ Specify old password
 Old password:
☒ Enforce password policy
☒ Enforce password expiration
☒ User must change password at next login

☐ Mapped to certificate
☐ Mapped to asymmetric key
☐ Map to Credential **Add**

Credential	Provider
------------	----------

Remove

Default database:
 Default language:

OK **Cancel**

70. In the **Select User, Service Account, or Group** dialog box, click **Advanced...**

Select User, Service Account, or Group

Select this object type:

Object Types...

From this location:

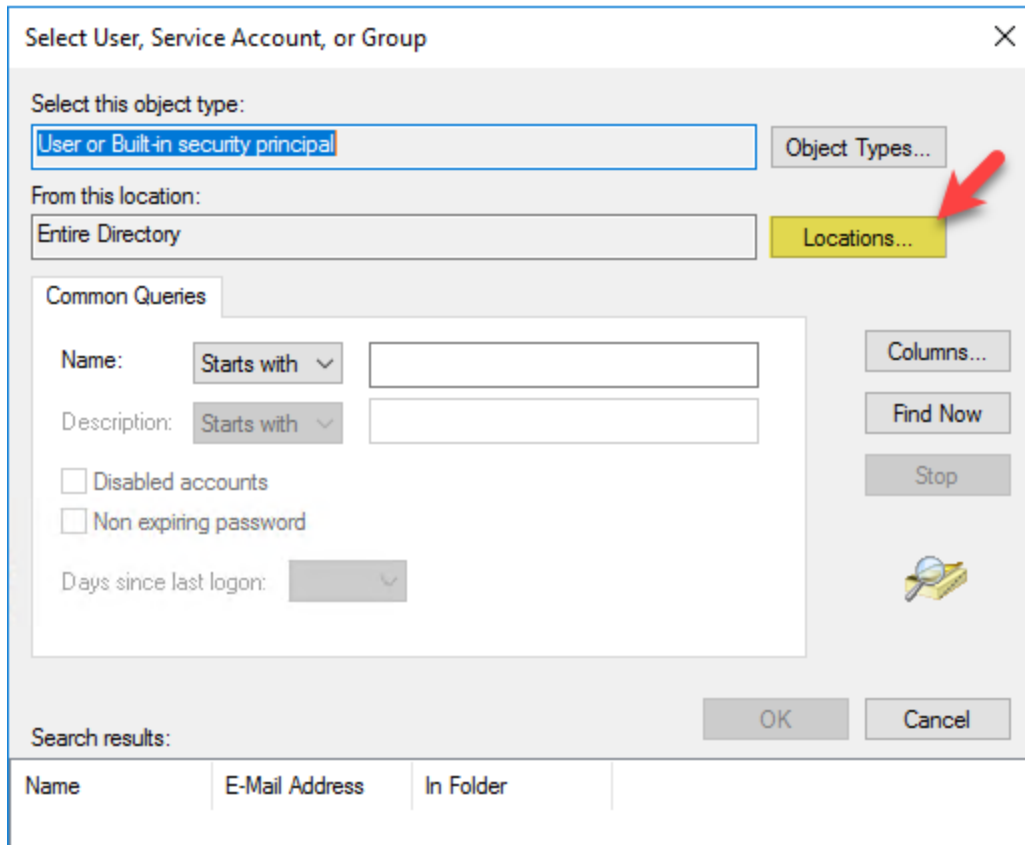
Locations...

Enter the object name to select (examples):

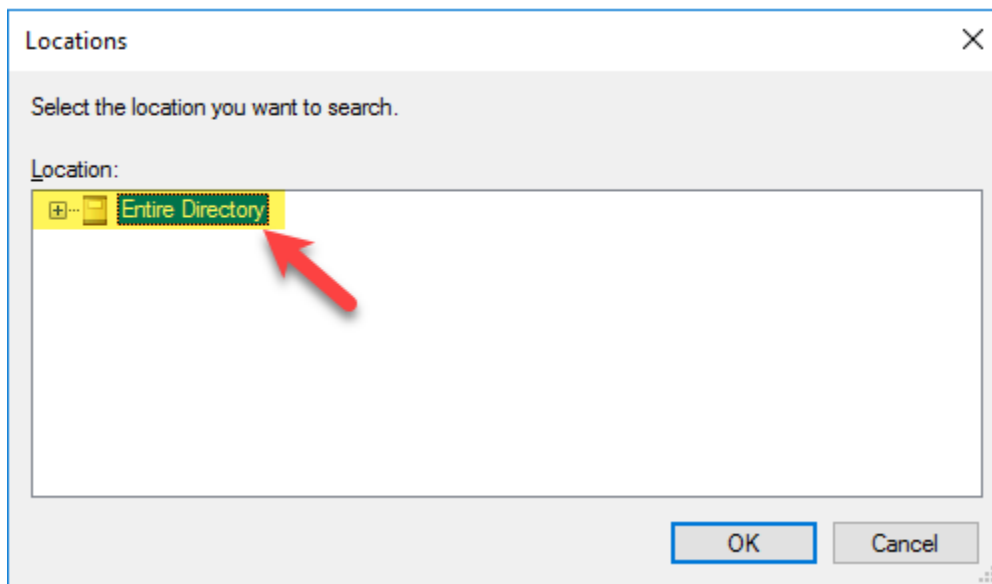
Check Names

Advanced... **OK** **Cancel**

71. Click **Locations...**



72. In the **Locations** dialog box, verify **Entire Directory** is selected, then click **OK**.



73. In the **Select User, Service Account, or Group** dialog box, move to the **Starts with** setting and enter SVC_Farm into the corresponding text box.

Select User, Service Account, or Group

Select this object type:
 User or Built-in security principal

From this location:
 Entire Directory

Common Queries

Name: Starts with SVC_Farm

Description: Starts with

☐ Disabled accounts

☐ Non expiring password

Days since last logon:

Find Now

Stop

OK

Cancel

Name	In Folder	E-Mail Address
SVC_Farm	RonsNotes.traini...	

74. Click **Find Now**.

75. Notice you now see **SVC_Farm** listed below in the **Search results**.

Search results:

Name	In Folder	E-Mail Address
SVC_Farm	RonsNotes.traini...	

76. Click **OK**.

77. Back in the **Select User, Service Account, or Group** dialog box, review the results.

Select User, Service Account, or Group

Select this object type:
 User or Built-in security principal

From this location:
 Entire Directory

Enter the object name to select (examples):
 SVC_Farm

Check Names

Advanced...

OK

Cancel

78. Click **OK**.
79. Back in the **Login – New** dialog box, review the results, then click **OK**.

Login - New

Select a page

- General
- Server Roles
- User Mapping
- Securables
- Status

Script **Help**

Login name:

☒ Windows authentication
☐ SQL Server authentication

Password:

Confirm password:

☐ Specify old password

Old password:

☒ Enforce password policy
☒ Enforce password expiration
☒ User must change password at next login

☐ Mapped to certificate
☐ Mapped to asymmetric key
☐ Map to Credential

Mapped Credentials

Credential	Provider
------------	----------

Default database:

Default language:

Connection

Server: HUMONGOUS

Connection: RONSNOTES\Student

[View connection properties](#)

Progress

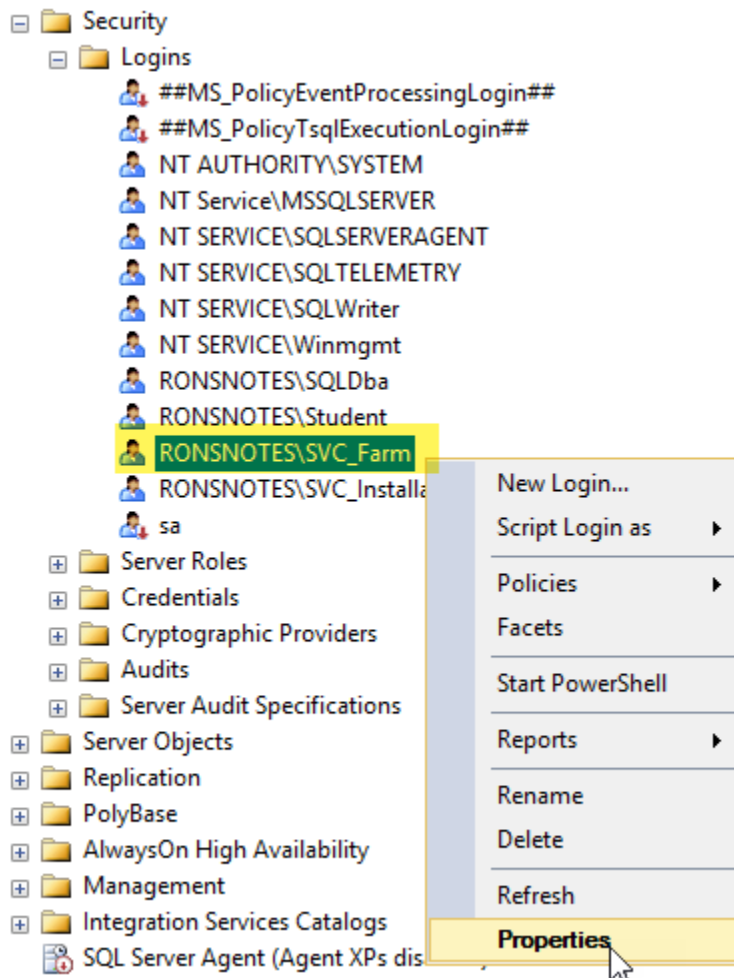
80. Repeat the prior twelve steps to create a login for **SVC_Installation**.

Search results:

Name	In Folder	E-Mail Address
SVC_Installation	RonsNotes.training.local/RN_Users/Svc_Accounts	

81. Move back to the **Object Explorer** pane on the left and expand **Logins** folder.

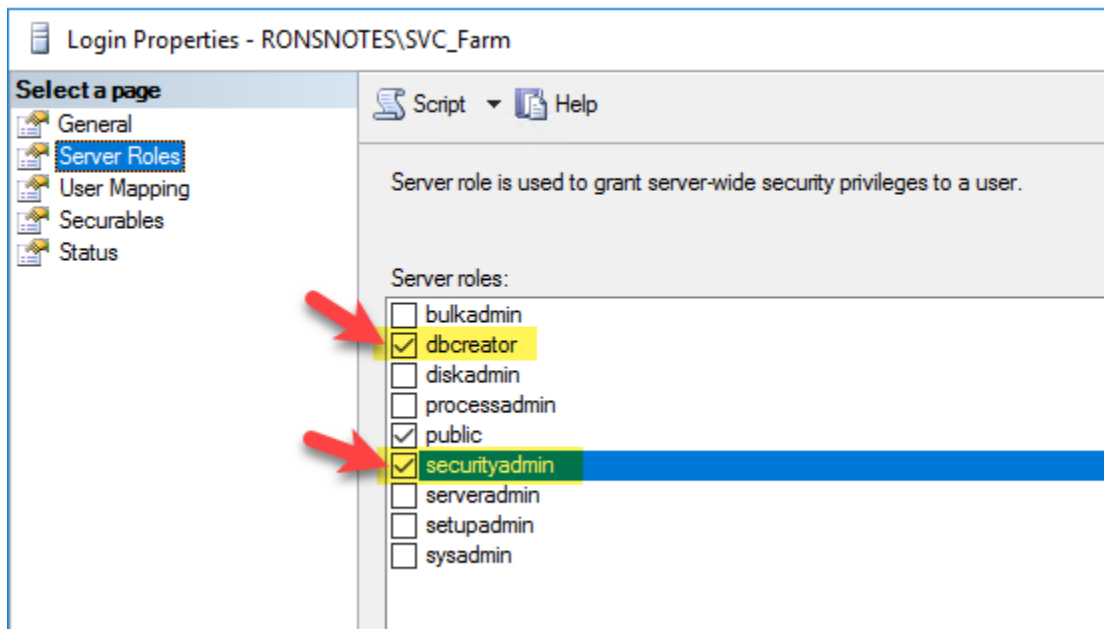
82. Right-click **RONSNOTES\SVC_Farm** and click **Properties**.



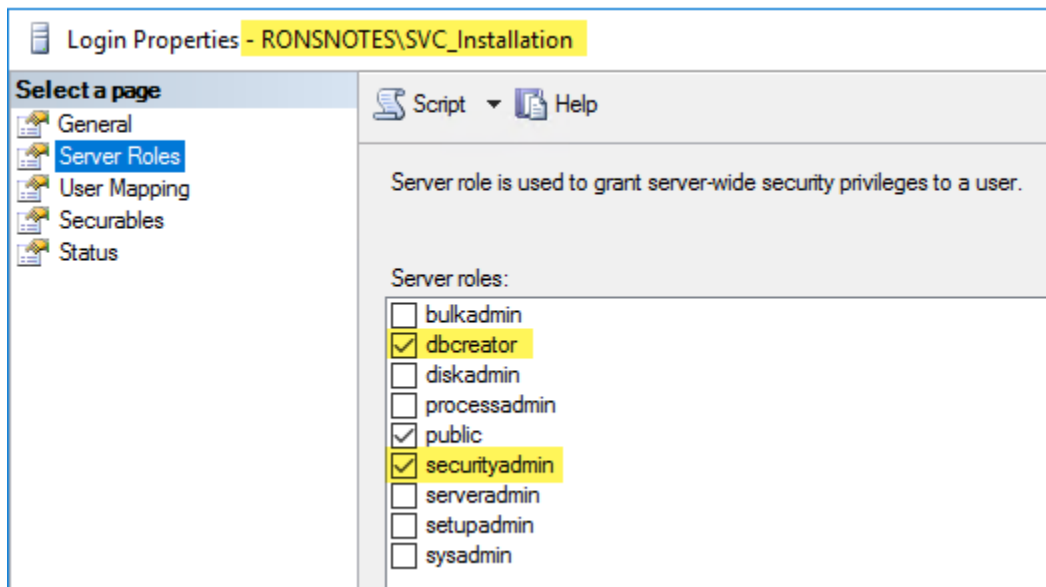
83. When the **Login Properties – RONSNOTES\SVC_Farm** dialog box opens, review the settings and options available.

84. Move to the pane on the left and click **Server Roles**.

85. Navigate to the **Server roles** setting and place a check in both the **dbcreator** and **securityadmin** check boxes.



86. Click **OK**.
87. Repeat the last five steps for **SVC_Installation**.



88. Close **SSMS**.
89. Restart the virtual machine.
90. When the virtual machine comes back up, log on as **Student**.
91. Open **File Explorer** and double-click the drive containing **SQL2016_x64_ENU**.
92. Double-click **setup**.
93. In the **User Account Control** dialog box, click **Yes**.
94. In **SQL Server Installation Center**, click **Installation** tab.

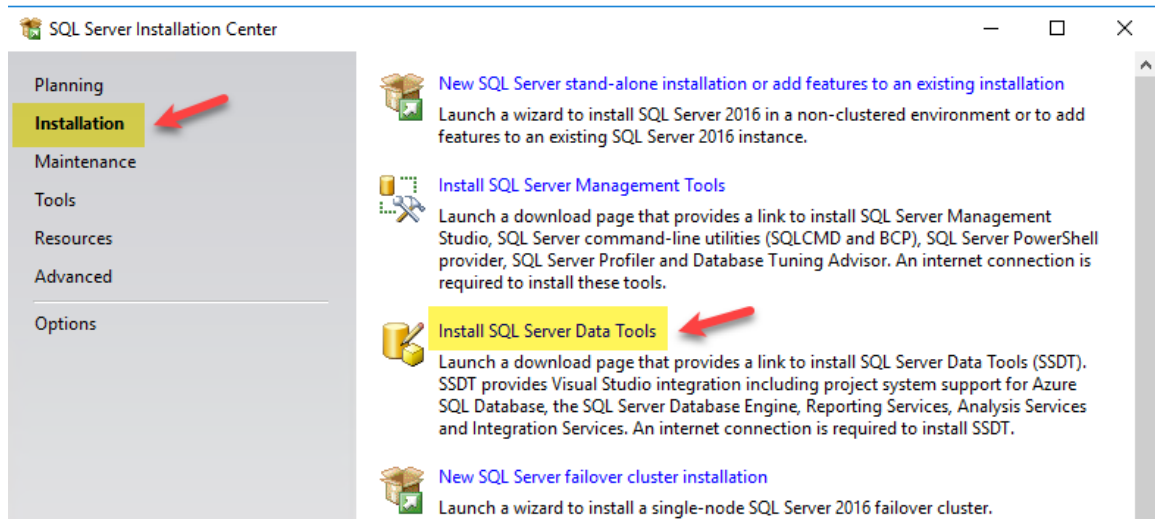
Task: Install SQL Server Data Tools

There is no PowerShell script equivalent to this task.

1. Click **Install SQL Server Data Tools** link.

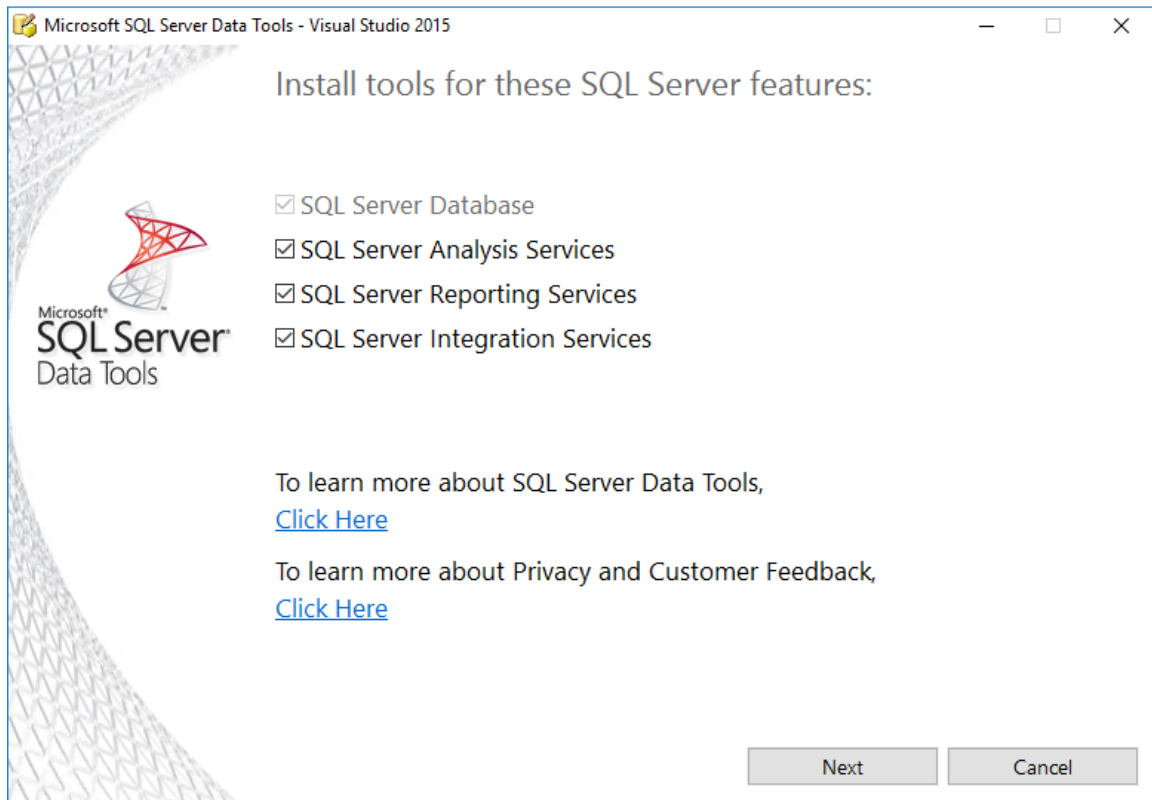


If you receive the Internet Explorer settings dialog box, move the radio button to Don't use recommended settings and click OK.

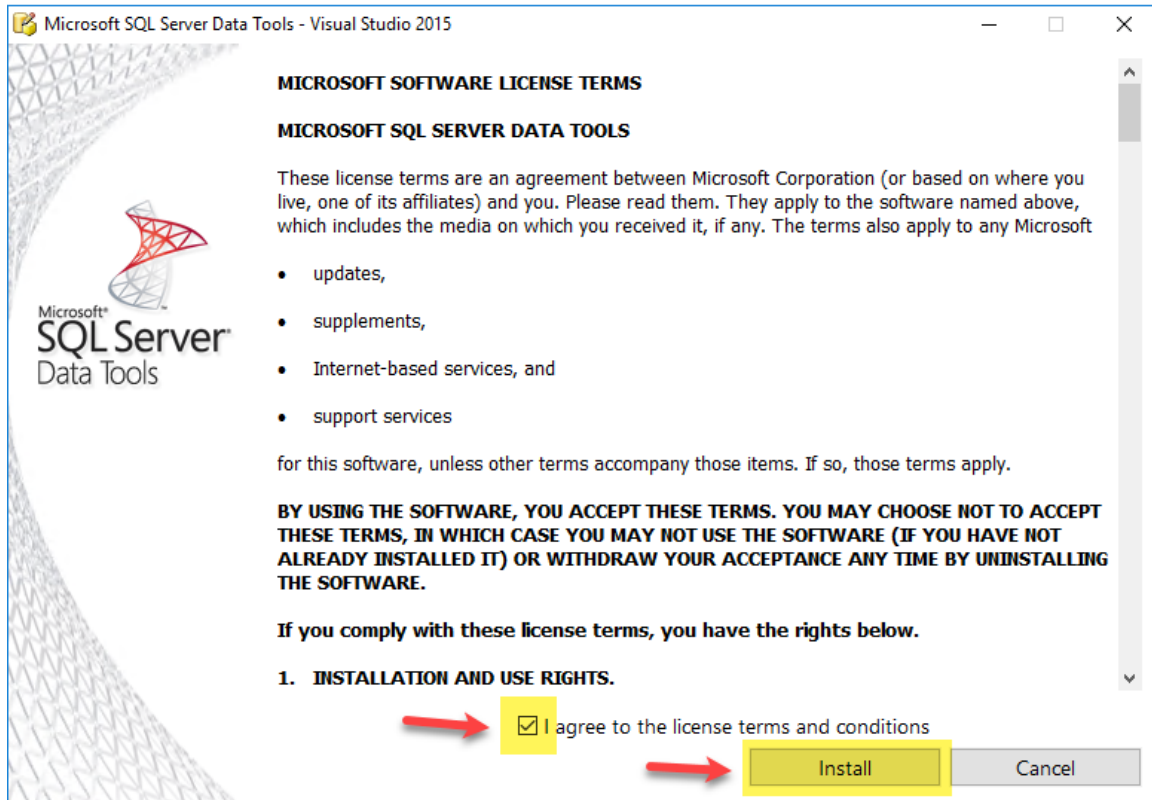


2. Click the **Download SQL Server Data Tools (Current release for production use)** link.
3. Click **Download SQL Server Data Tools**.
4. In the prompt below asking **Do you want to run or save SSDTSetup.exe**, click **Save** (just in case).
5. Wait for the download to complete.
6. Once the download completes, move to the **SSDTSetup.exe download has completed** prompt, and click **Run**.

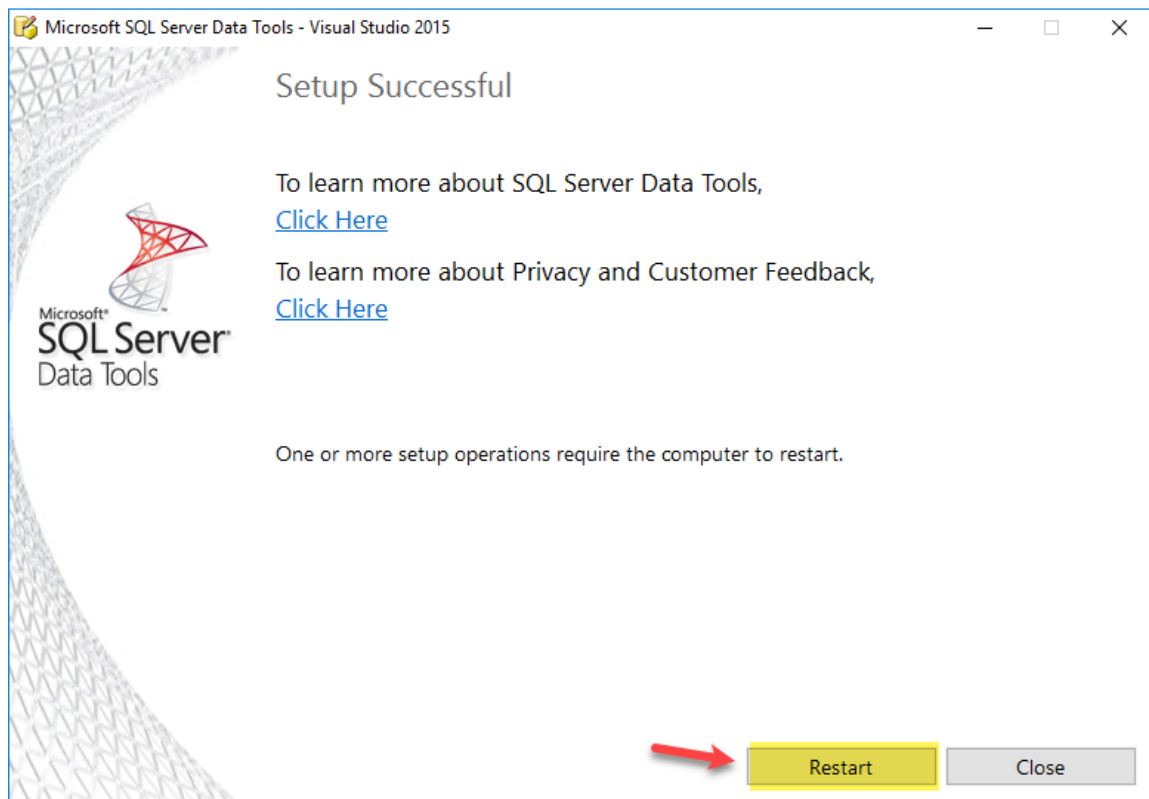
7. In the **Install tools for these SQL Server features** dialog box, review the information and click **Next**.



8. In the **Microsoft Software License Terms** dialog box, place a check in the **I agree to the license terms and conditions** check box.
9. Click **Install**.



10. In the **Setup Successful** dialog box, click **Restart**.



11. When the virtual machine comes back up, click **Other user** in the lower-left corner, then log in as **Student**.
12. Press the **Windows** key, then enter **SQL Server Data**.
13. Right-click **SQL Server Data Tools 2015**, then click **Pin to taskbar**.
14. Press **Esc** to return to desktop view.

Lab Files

Switch to your host machine, navigate to the downloaded/cloned repository files, then copy the **Lab Files** folder and paste it into **C:** drive on the **Humongous** virtual machine.

MANUAL STEP-BY-STEP BUILD

PHASE 01 HYPER-V SETUP AND FILE STRUCTURE BUILD

Phase Objective

In this phase, you will enable enhanced mode in Hyper-V Manager, create two virtual switches, and build the file structure.

Phase Topics

In this phase, we will:

- Enable Enhanced Mode in Hyper-V
- Creating Virtual Switches
- Building the File Structure
- Download the ISOs of Server 2016 and SQL Server 2016 to the Created Directories

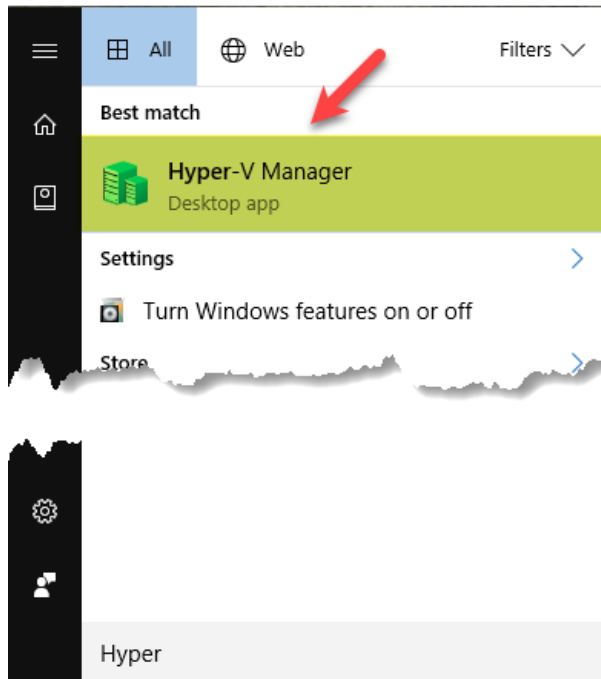
We use the same file structure for the licensed and evaluation software build, so some folders may be used in one and not the other.

Enabling Enhanced Mode in Hyper-V

Task: Pin Hyper-V Manager to the Task Bar on Your Host PC

**Note: there is no PowerShell code block for this task.*

1. Press **Windows** key and enter **Hyper**.
2. Right-click the **Hyper-V Manager** icon, then click **Pin to taskbar**.



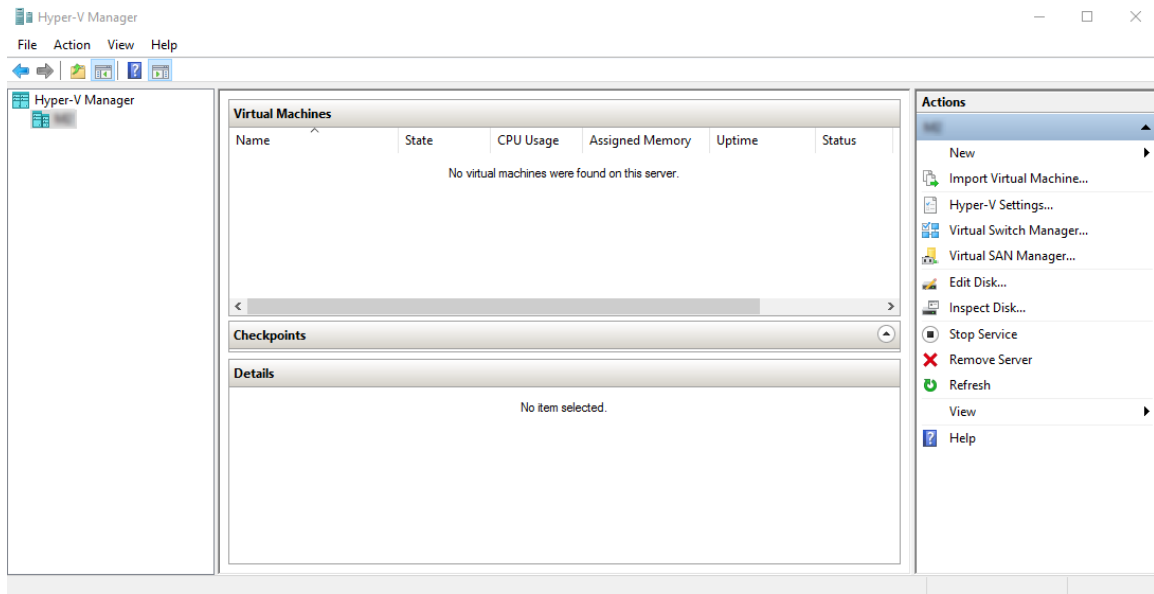
3. Press **Esc** to return to the desktop.

Task: Enable Enhanced Mode in Hyper-V

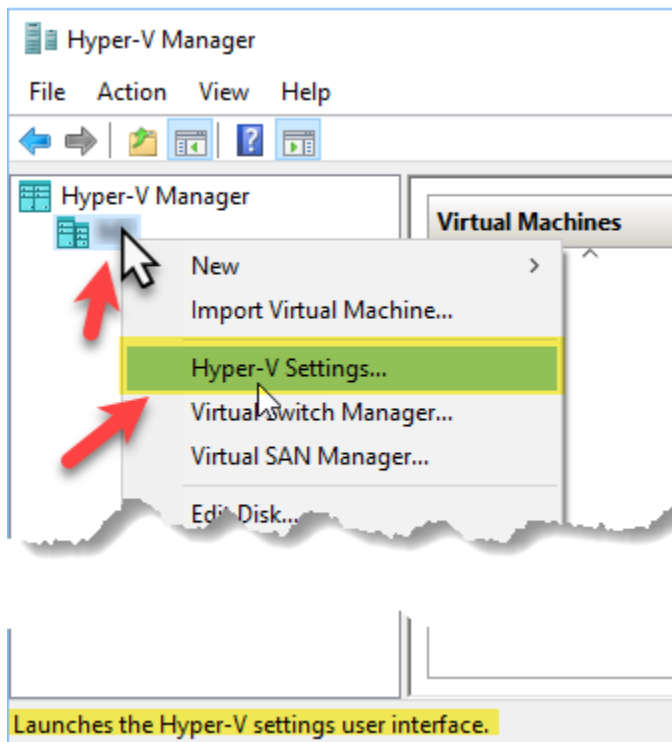
- If you prefer the PowerShell script instructions for this task, [click here](#).

```
Set-VMhost -EnableEnhancedSessionMode $TRUE
```

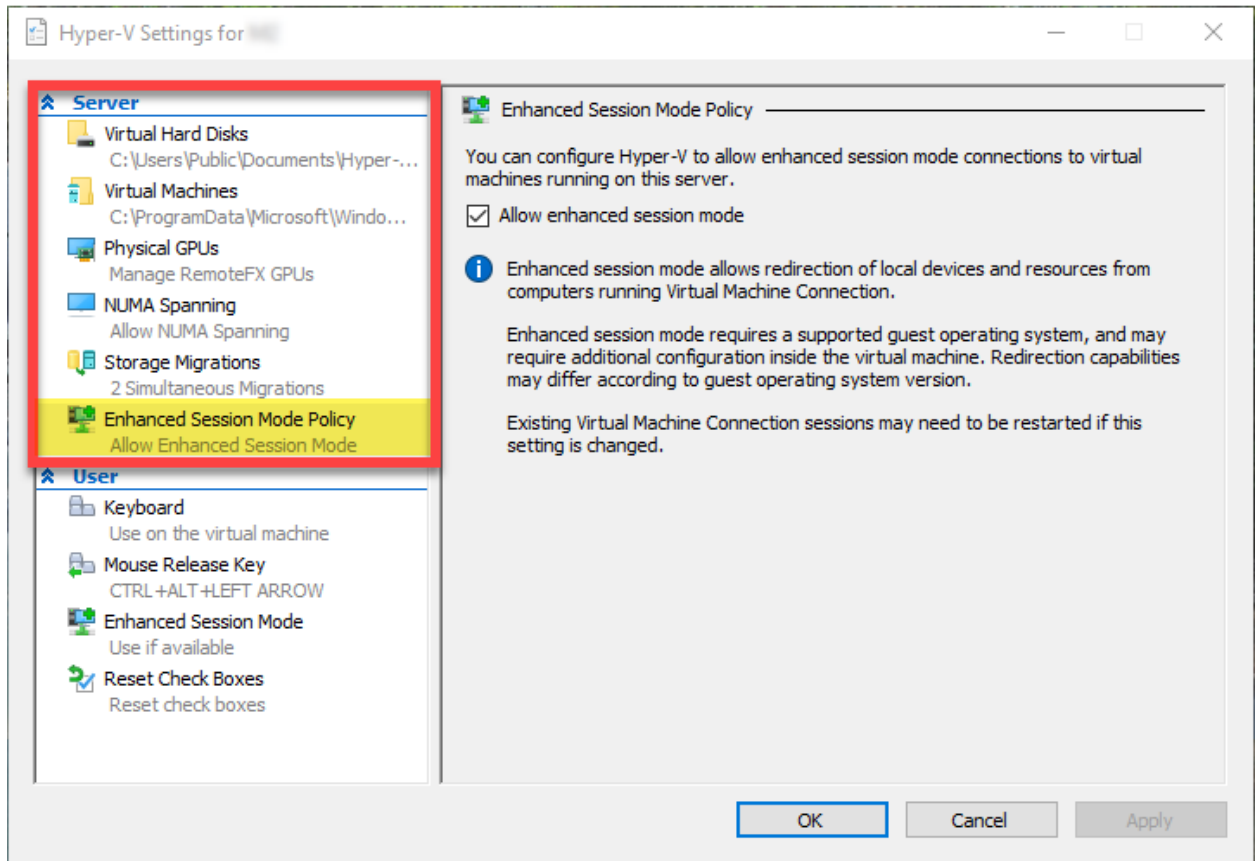

1. Move down to the taskbar, and start **Hyper V Manager**.
2. When **Hyper-V Manager** opens, review the options available.



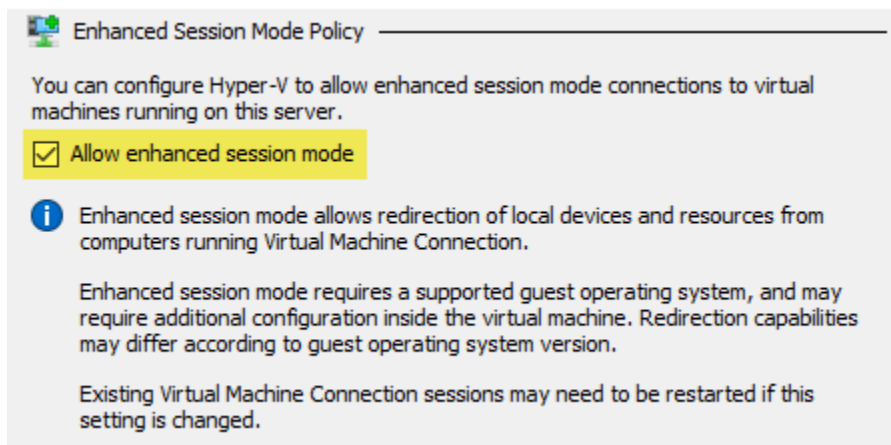
3. Navigate to the pane on the left, right-click the name of the local computer, and click **Hyper-V Settings**.



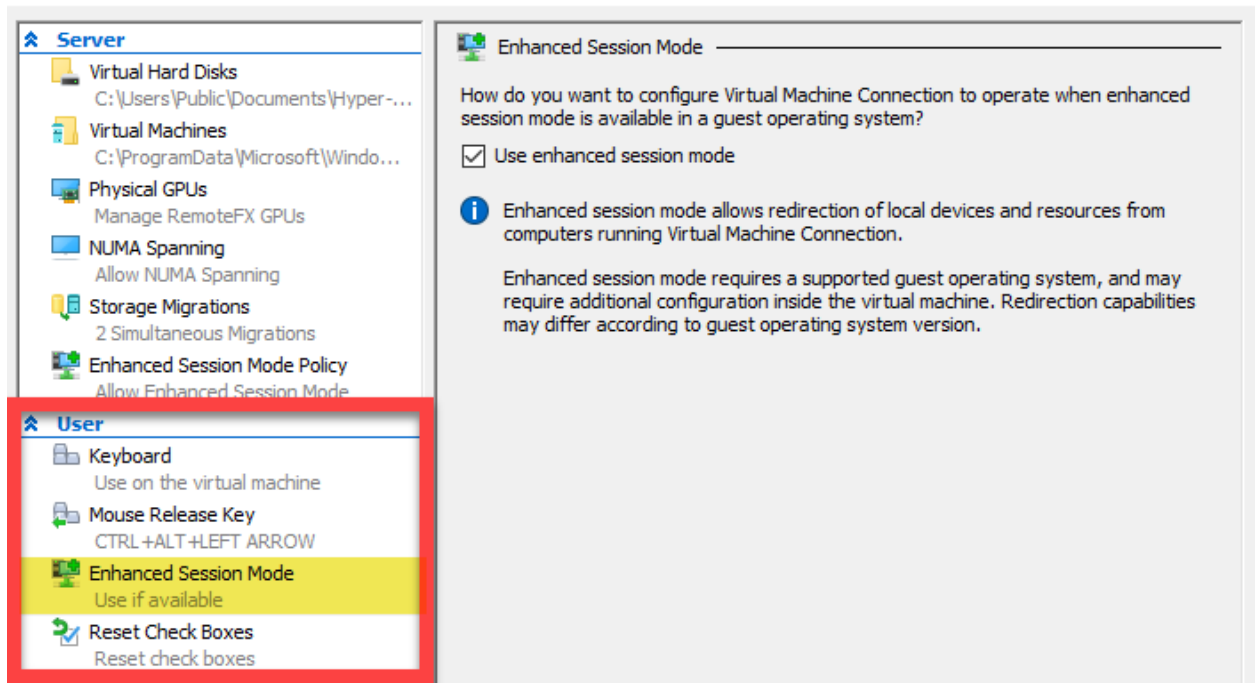
4. When **Hyper-V Settings** opens, move to the pane on the left, locate the **Server** section and click to select **Enhanced Session Mode Policy**.



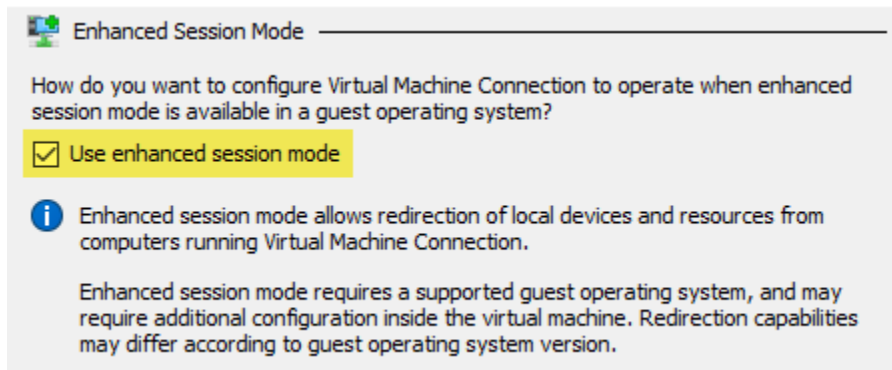
5. Verify there is a check in the **Allow enhanced session mode** check box.



6. If changes were made, click **Apply**.
7. Move to the pane on the left, locate the **User** section and click to select **Enhanced Session Mode Policy**.



8. Verify there is a check in the **Use enhanced session mode** check box.



9. If changes were made, click **Apply**.
10. Click **OK**.

Creating Virtual Switches

Virtual switches provide a way for a virtual machine to connect to a physical network. There are three types:

- External Network
- Internal Network
- Private Network

Task: Create Virtual Switches

- If you prefer the PowerShell script instructions for this task, [click here](#).

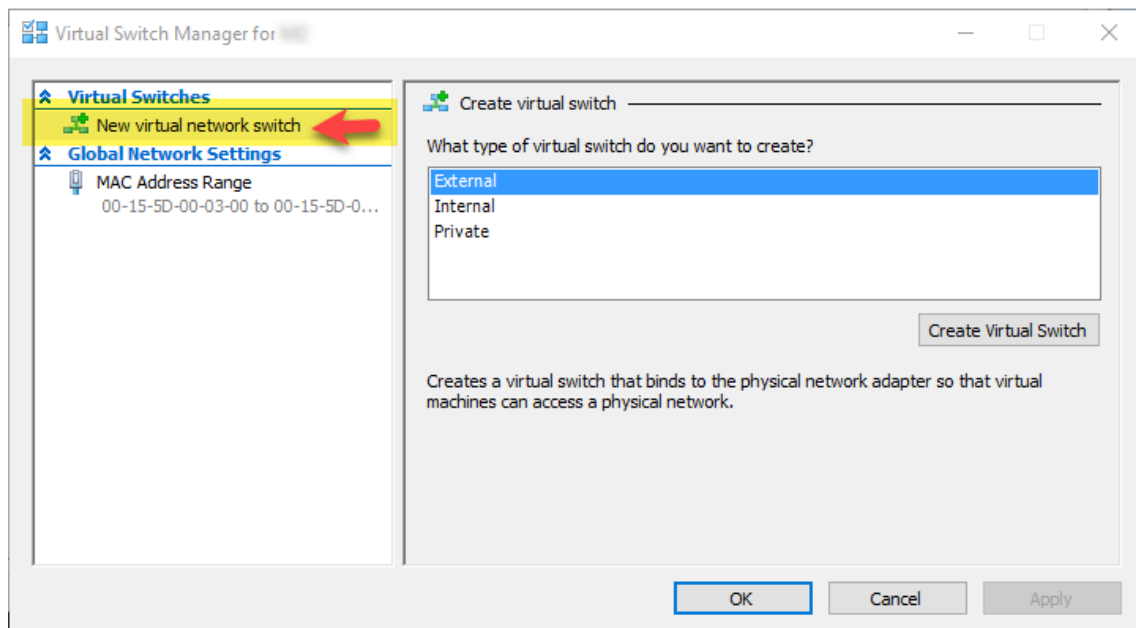
```
#TASK: CREATE VIRTUAL SWITCHES
Function Create-vmSwitches{
$ExistSwitchPrivate = get-VMSwitch -SwitchType Private -Name "VMPrivateNetwork"
-ErrorAction SilentlyContinue

If (!(($ExistSwitchPrivate))){
New-VMSwitch "VMPrivateNetwork" -SwitchType Private
}

$ExistExternalSwitch = Get-VMSwitch -Name "VMExternalNetwork" -SwitchType
External -ErrorAction SilentlyContinue
$ExistExternalSwitch
$NAdapterName = Get-NetAdapter -Physical
If (!(($ExistExternalSwitch))){
New-VMSwitch -Name "VMExternalNetwork" -NetAdapterName $NAdapterName.Name
}}

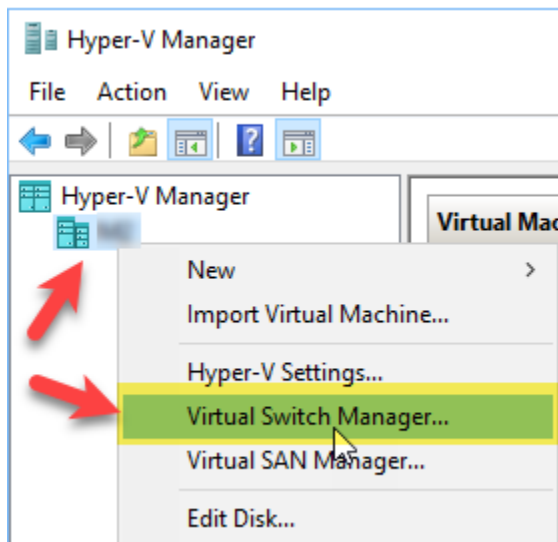
Create-vmSwitches
```

1. Navigate to the pane on the left, right-click the name of the local computer, and click **Virtual Switch Manager**.
2. When **Virtual Switch Manager** opens, select **New virtual network switch**.

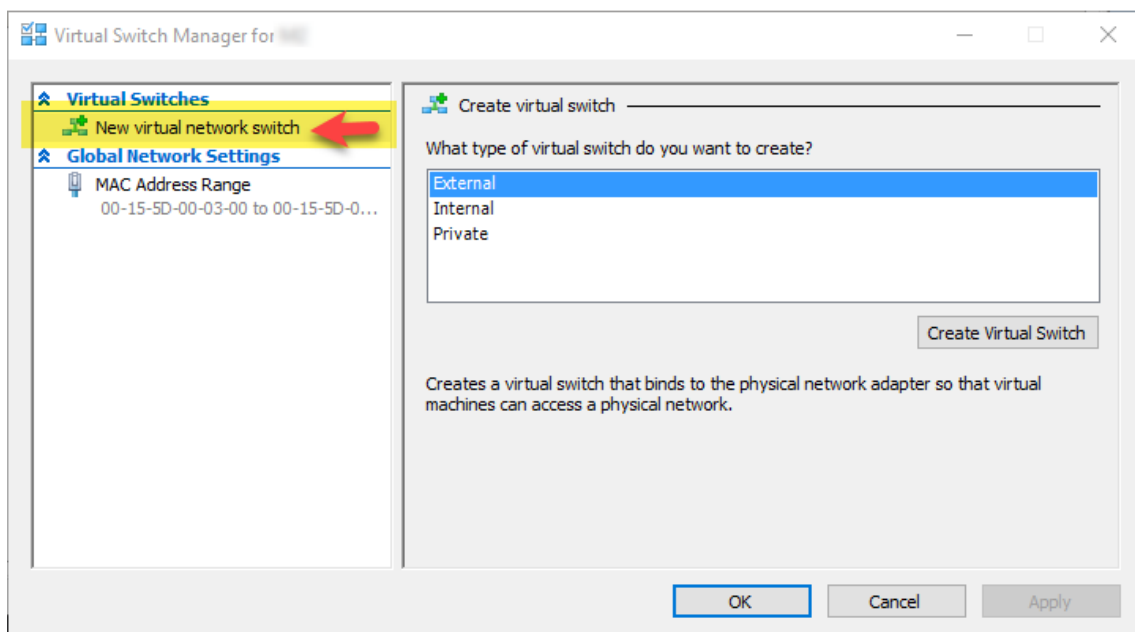


3. Move to the **What type of virtual switch do you want to create** setting and click to select **Private**.
4. Click **Create Virtual Switch**.
5. Move to the **Name** text box and name the switch **VMPrivate** (or whatever you prefer).
6. Make sure it is connected to the **Private** network.

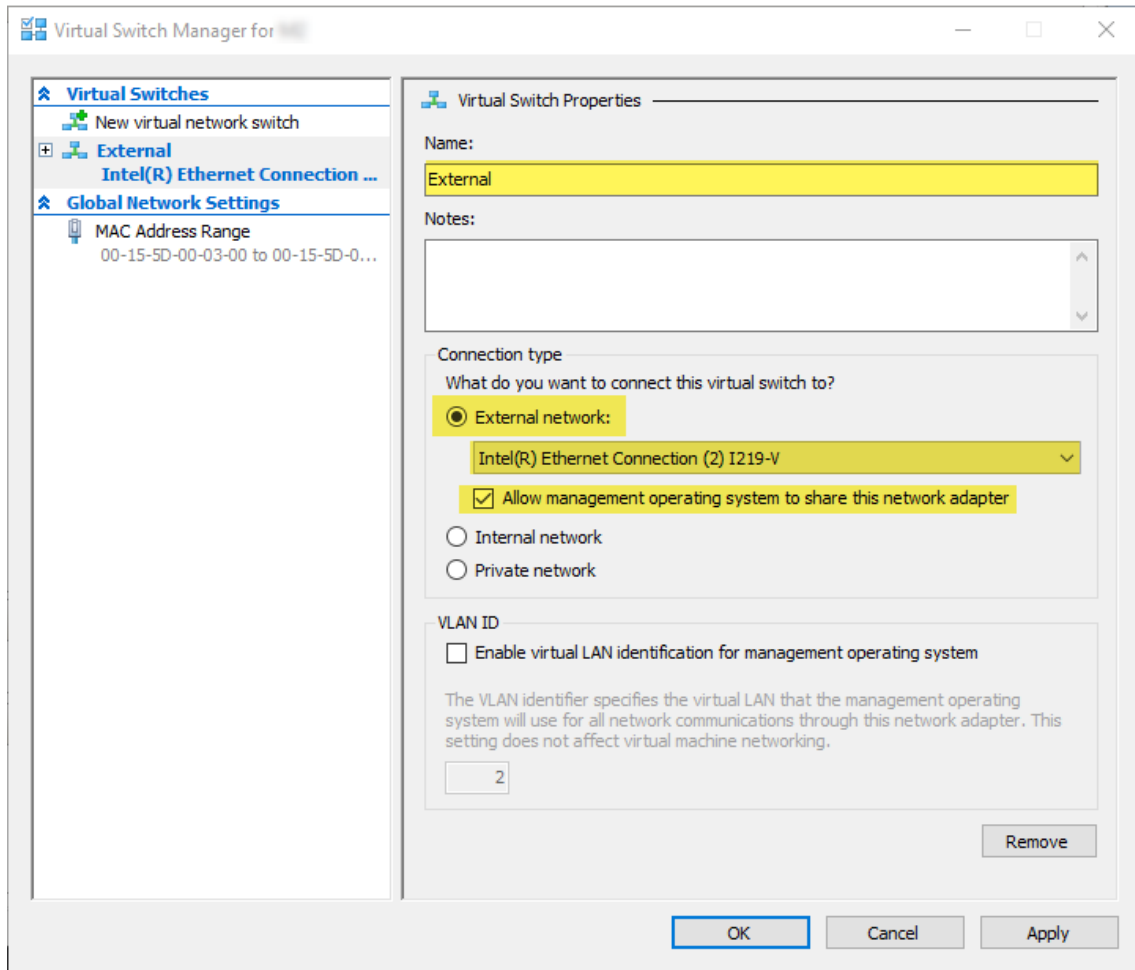
7. Click **Apply**.
8. Click **OK**.
9. Navigate to the pane on the left, right-click the name of the local computer, and click **Virtual Switch Manager**.



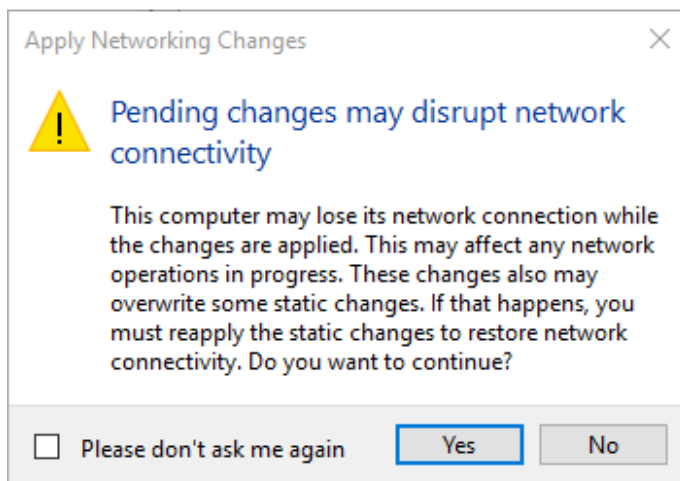
10. When **Virtual Switch Manager** opens, select **New virtual network switch**.



11. Move to the **What type of virtual switch do you want to create** setting and click to select **External**.
12. Click **Create Virtual Switch**.
13. Move to the **Name** text box and name the switch **VMExternal1** (or whatever you prefer).
14. Make sure it is connected to the **External** network, and that your physical Network Interface Card shows in the corresponding setting.
15. Place a check in the **Allow management operating system to share this network adapter**.



16. Click **Apply**.
17. In the **Apply Networking Changes** dialog box advising **This computer may lose its network connection while the changes are applied**, click **Yes**.



18. Click **OK**.

Building the File Structure

Task: Build the File Structure

- If you prefer the PowerShell script instructions for this task, [click here](#).

```
#TASK: BUILD THE FILE STRUCTURE
Function Build-FileStructure{

If(!( Test-Path c:\RonsNotes\ISOs\Server2016\)){
New-Item C:\RonsNotes\ISOs\Server2016\ -ItemType directory -ErrorAction
SilentlyContinue}

If(!( Test-Path c:\RonsNotes\ISOs\SQL2016\)){
New-Item C:\RonsNotes\ISOs\SQL2016\ -ItemType directory -ErrorAction
SilentlyContinue}

<#If(!( Test-Path c:\RonsNotes\ISOs\Sharepoint2016\)){
New-Item C:\RonsNotes\ISOs\Sharepoint2016\ -ItemType directory -ErrorAction
SilentlyContinue}>#>

If(!( Test-Path c:\RonsNotes\Labs\)){
New-Item C:\RonsNotes\Labs\ -ItemType directory -ErrorAction
SilentlyContinue}

If(!( Test-Path c:\RonsNotes\Script_Folders\)){
New-Item C:\RonsNotes\Script_Folders\ -ItemType directory -ErrorAction
SilentlyContinue}

#Upon completion, File Explorer will be open showing the RonsNotes folder
contents.
ii C:\RonsNotes
} #End
Build-FileStructure
```

1. Start **File Explorer**.
2. Navigate to **C:/**.
3. Create a new folder and name the folder **RonsNotes**.
4. Double-click to open **RonsNotes** folder, and create three more folders:
 - ISOs
 - Labs
 - Script_Folders
5. Double-click to open **ISOs** folder, and create two more folders:
 - Server2016
 - SQL2016
6. Back out of the **ISOs** folder, and leave **File Explorer** open.



Download the ISOs of Server 2016 and SQL Server 2016 to the Created Directories

Task: Download the ISOs of Server 2016 and SQL Server 2016 to the Created Directories, and the Needed Database Files

In this task, we will download ISOs for the software we intend to install.

5. Switch back to **File Explorer** and verify you are still viewing **C:\RonsNotes**.
6. Double-click to open the **ISOs** folder, and notice you have two folders listed.

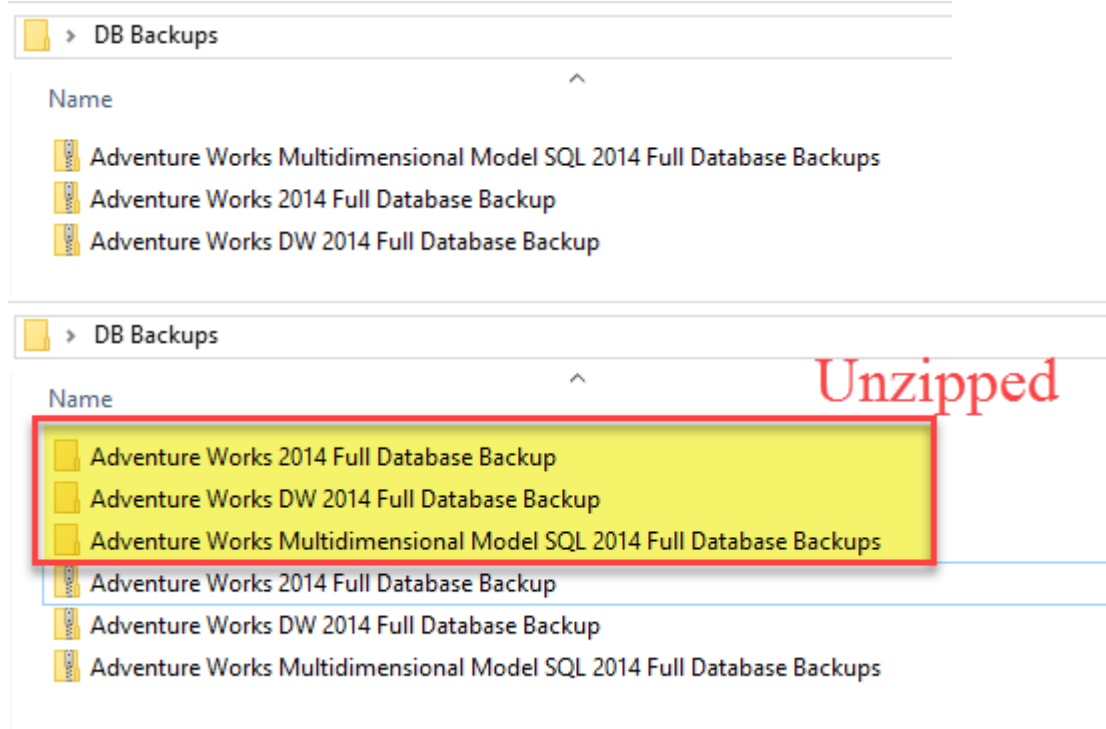
Name

 Server2016
 SQL2016

7. Start **Internet Explorer** or the browser of your choice.

8. Using the links provided below:

- Download the installation files to the appropriate folder (shown above).
- Download the database files and place them into a folder named **DB Backups**.
 - The files will download as .zip files, which will need to be unzipped within the **DB Backups** folder.



You will need to register in order to download the required ISO files.

- **Server 2016** – <https://www.microsoft.com/en-us/evalcenter/evaluate-windows-server-2016>
- **SQL Server 2016** - <https://www.microsoft.com/en-us/evalcenter/evaluate-sql-server-2016>
- **Adventure Works 2014** - <https://msftdbprodsamples.codeplex.com/releases/view/125550>
 - Adventure Works 2014 Full Database Backup.zip
 - Adventure Works DW 2014 Full Database Backup.zip
 - Adventure Works Multidimensional Model SQL 2014 Full Database Backups.zip

Upon completion, you will have the file structure built, and the downloaded ISOs placed into the proper locations, and the database files downloaded into the new **DB Backups** folder.

PHASE 02 CREATE VIRTUAL MACHINES AND INSTALL SERVER 2016

Phase Objective

This phase creates the virtual machine. First, we will create the Virtual Hard Drive (VHDX format), then we will install Server 2016. We are assuming you are using evaluation licenses. If not, proceed as is, then at the end, you can just convert to MSDN by changing your keys.

After creating the virtual machine, we will enable Guest Services, then install Server 2016.

Phase Topics

- Verifying the Correct Files Are in the Proper Location

- Creating the Virtual Machine
- Installing Windows Server 2016

Verifying the Correct Files Are in the Proper Location

Task: Verifying the Correct Files Are in the Proper Location

- If you prefer the PowerShell script instructions for this task, [click here](#).

```
#TASK: VERIFYING THE CORRECT FILES ARE IN THE PROPER LOCATION
Function Test-CorrectFiles {
# Test for the moving of the correct images to the expected location else fail

$ISOSvr2016 = Get-ChildItem C:\RonsNotes\ISOs\Server2016\ | %{$_.Name} -
ErrorAction inquire # ASK
$ISOsql = Get-ChildItem C:\RonsNotes\ISOs\SQL2016\ | %{$_.Name} -ErrorAction
inquire # ASK
#$IMGSharePoint2016 = Get-ChildItem C:\RonsNotes\ISOs\Sharepoint2016\ | %{$_.Name}
-ErrorAction inquire # ASK

If ($ISOSvr2016 -eq "14393.0.160715-1616.RS1_RELEASE_SERVER_EVAL_X64FRE_EN-
US.ISO")
{Write-Host "Expected version of ISO for Server 2016 in expected location" -
ForegroundColor Green}
Else {Write-Host "Wrong or missing Server 2016 ISO. 14393.0.160715-
1616.RS1_RELEASE_SERVER_EVAL_X64FRE_EN-US.ISO expected Correct to continue " -
ForegroundColor Red; Read-Host -Prompt "Any key to continue" }

If ($ISOsql -eq "SQLServer2016-x64-ENU.iso")
{Write-Host "Expected version of IMG for SQLServer 2016 in expected location" -
ForegroundColor Green}
Else {Write-Host "Wrong or missing SQL 2016 ISO. SQLServer2016-x64-ENU.iso
expected. Correct to continue " -ForegroundColor Red ; Read-Host -Prompt "Any key
to continue"}

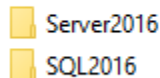
<#If ($IMGSharePoint2016 -eq "officeserver.img")
{Write-Host "Expected version of IMG for SharePoint Svr 2016 in expected location"
-ForegroundColor Green}
Else {Write-Host "Wrong or missing SharePoint.IMG. officeserver.img expected.
Correct to continue " -ForegroundColor Red ; Read-Host -Prompt "Any key to
continue"}#>

Write-Host "*****"
Write-Host "*****"
Write-Host "*****"
Write-Host "*****"

} #END
Test-CorrectFiles
```

1. Switch to **File Explorer**.
2. Navigate to **C:\RonsNotes\ISOs**.
3. Notice you have two folders listed.

Name



4. Verify you have the following file(s) in the corresponding folder.

Folder	File Name
Server2016	14393.0.160715-1616.RS1_RELEASE_SERVER_EVAL_X64FRE_EN-US.ISO
SQL2016	SQLServer2016-x64-ENU.iso

Creating the Virtual Machine

We will walk through configuring the virtual machine.



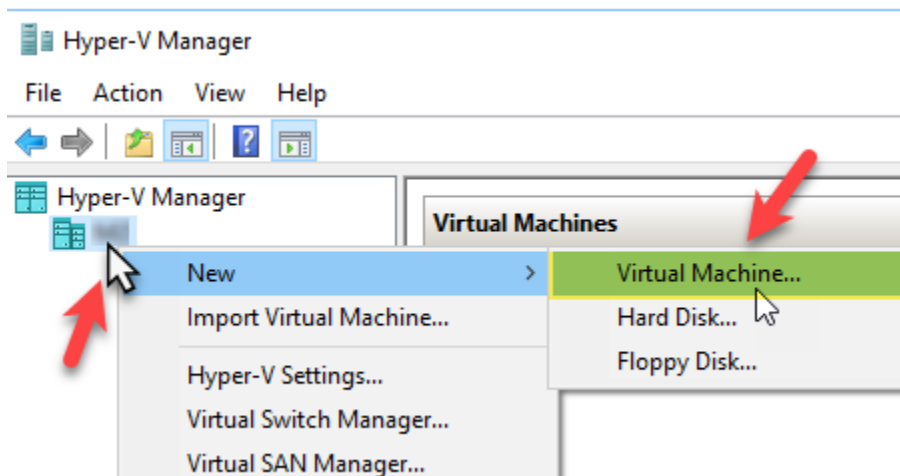
It is important to note that the finalized folder structures created by Hyper-V Manager will be slightly different if you've run the PowerShell script version to create the virtual machines.

Task: Create Humongous Virtual Machine

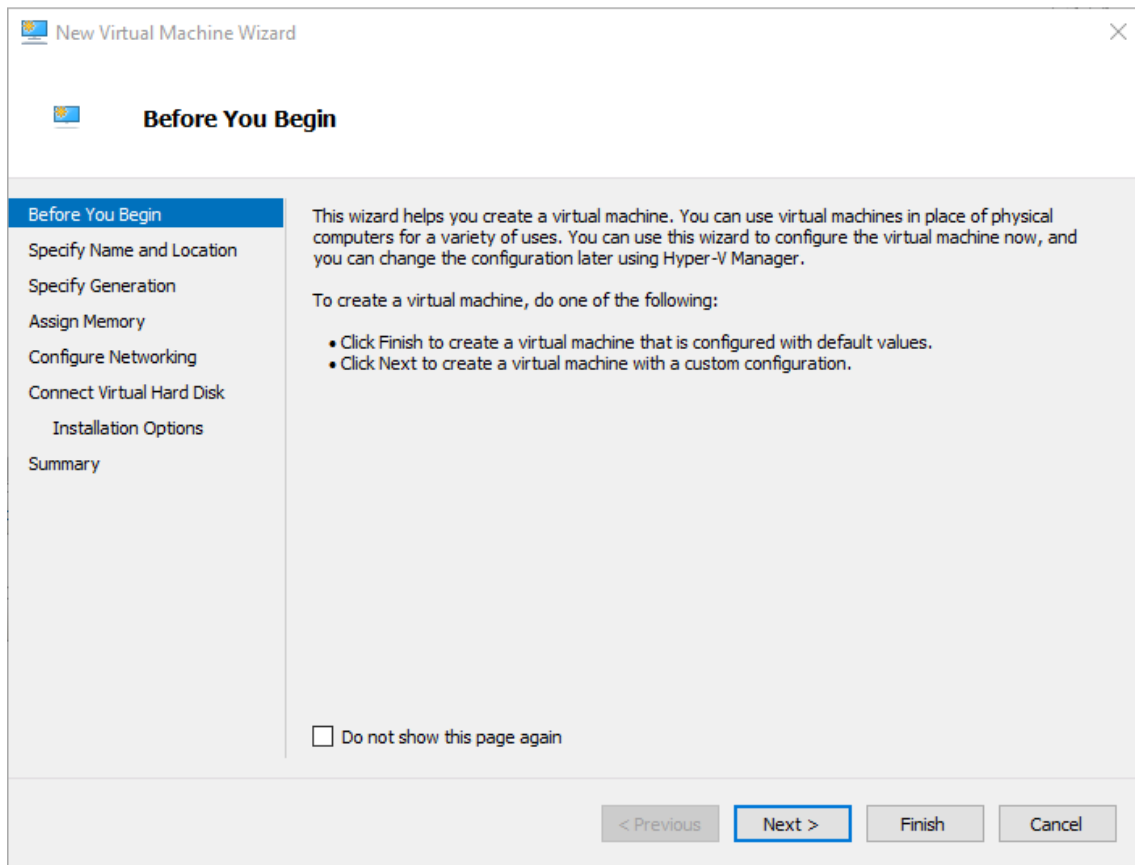
- If you prefer the PowerShell script instructions for this task, [click here](#).

```
#TASK: CREATE HUMONGOUS
Function Create-Humongous {
$VMName = "Humongous"
New-VHD -Path "C:\RonsNotes\VM_Drives\Humongus\Humongus.vhdx" -SizeBytes 80GB -
Dynamic
New-vm -Name $VMName -MemoryStartupBytes 4GB -VHDPATH
"C:\RonsNotes\VM_Drives\Humongus\Humongus.vhdx" -BootDevice IDE -SwitchName
"VMEternalNetwork"
Set-VMdvdDrive -VMName $VMName -ControllerNumber 1 -ControllerLocation 0 -Path
C:\RonsNotes\ISOs\Server2016\14393.0.160715-
1616.RS1_RELEASE_SERVER_EVAL_X64FRE_EN-US.ISO
Set-vm $VMName -ProcessorCount 4
Add-VMdvdDrive -VMNAME $VMName -ControllerNumber 1 -ControllerLocation 1 -Path
C:\RonsNotes\ISOs\SQL2016\SQLServer2016-x64-ENU.iso
Start-VM $VMName
} #END
Create-Humongous
```

1. In **Hyper-V Manager**, right-click on the name of your server, and select **New | Virtual Machine....**



2. When the **New Virtual Machine Wizard** opens, view the message in the **Before You Begin** section, then click **Next**.



3. Navigate to the **Name** text box and enter **Humongous**.
4. Place a check in the **Store the virtual machine in a different location** check box.

5. Click the corresponding **Browse...**

The screenshot shows the 'New Virtual Machine Wizard' dialog box, specifically the 'Specify Name and Location' step. The left sidebar contains a list of steps: 'Before You Begin', 'Specify Name and Location' (highlighted), 'Specify Generation', 'Assign Memory', 'Configure Networking', 'Connect Virtual Hard Disk', 'Installation Options', and 'Summary'. The main area contains the following text and controls:

- Header: **Specify Name and Location**
- Section: **Specify Name and Location**
- Text: Choose a name and location for this virtual machine.
- Text: The name is displayed in Hyper-V Manager. We recommend that you use a name that helps you easily identify this virtual machine, such as the name of the guest operating system or workload.
- Text: Name:
- Text: You can create a folder or use an existing folder to store the virtual machine. If you don't select a folder, the virtual machine is stored in the default folder configured for this server.
- Text: ☒ **Store the virtual machine in a different location!**
- Text: Location: **Browse...**
- Text: **!** If you plan to take checkpoints of this virtual machine, select a location that has enough free space. Checkpoints include virtual machine data and may require a large amount of space.
- Buttons: < Previous, Next > (highlighted), Finish, Cancel

6. In the **Select Folder** dialog box, navigate to **C:\RonsNotes**.
7. Within the **RonsNotes** folder, create a new folder named **VM_Drives**.
8. Double-click to open **VM_Drives** folder.
9. Within the **VM_Drives** folder, create a new folder named **Humongous**.
10. Double-click to open **Humongous** folder.
11. Click **Select Folder**, then review your settings.

New Virtual Machine Wizard

Specify Name and Location

Before You Begin

Specify Name and Location

Specify Generation

Assign Memory

Configure Networking

Connect Virtual Hard Disk

Installation Options

Summary

Choose a name and location for this virtual machine.


The name is displayed in Hyper-V Manager. We recommend that you use a name that helps you easily identify this virtual machine, such as the name of the guest operating system or workload.

Name:

You can create a folder or use an existing folder to store the virtual machine. If you don't select a folder, the virtual machine is stored in the default folder configured for this server.

☒ Store the virtual machine in a different location

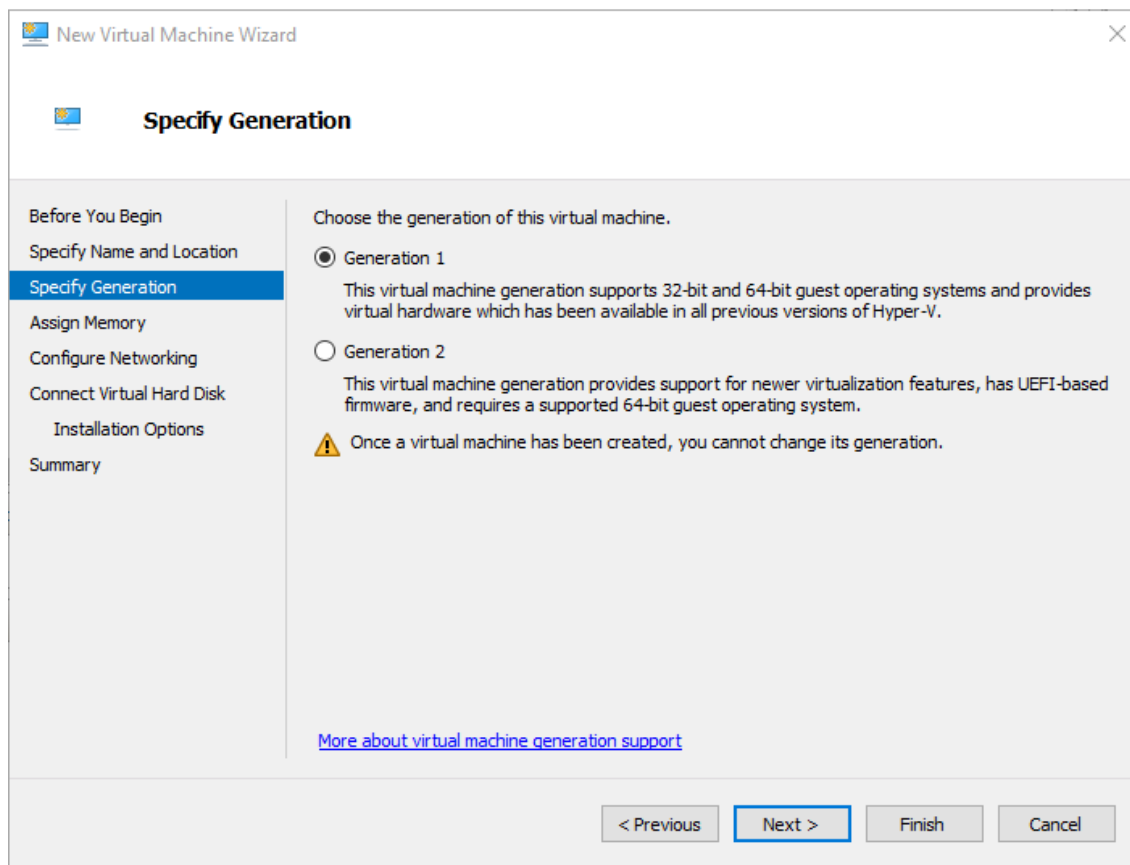
Location:

 If you plan to take checkpoints of this virtual machine, select a location that has enough free space. Checkpoints include virtual machine data and may require a large amount of space.

< Previous **Next >** Finish Cancel

12. Click **Next**.

13. In the **Specify Generation** dialog box, review the settings, then click **Next**.

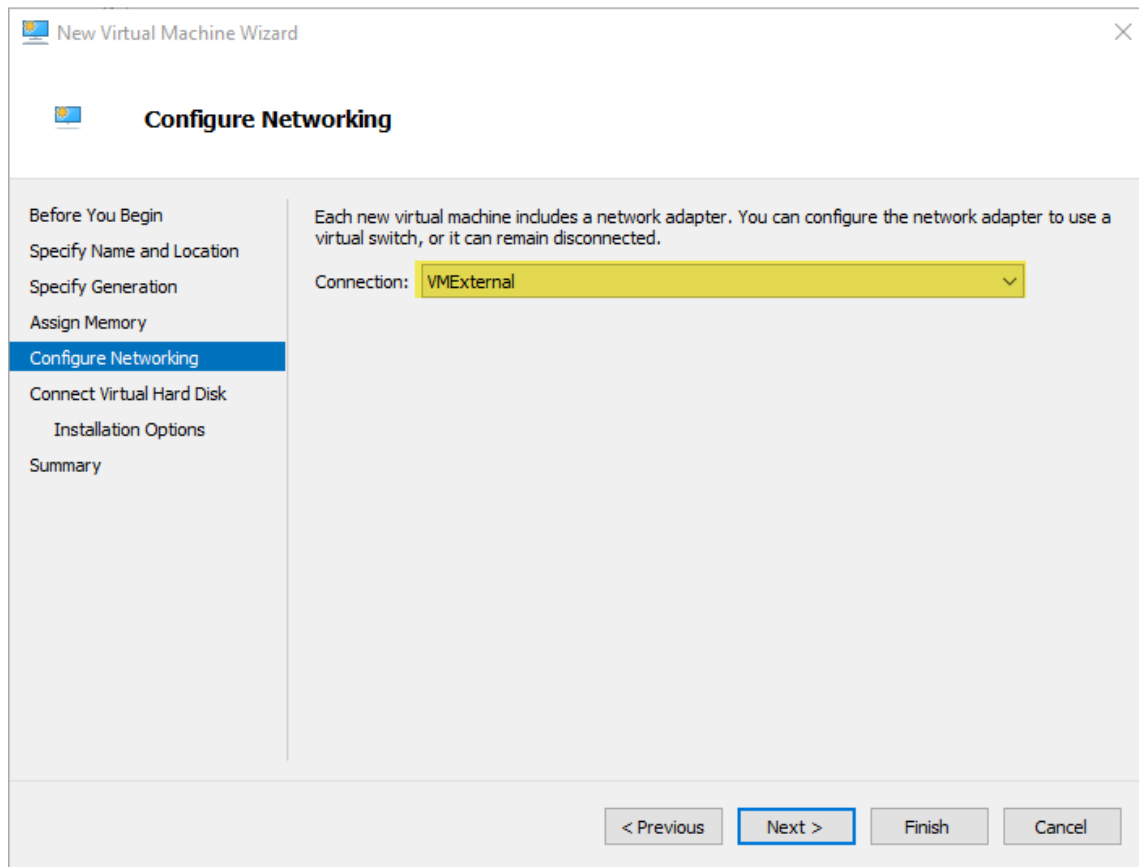


14. In the **Assign Memory** dialog box, set the **Startup memory** to 4000MB.

15. Verify there is a check in the **Dynamic Memory** check box.

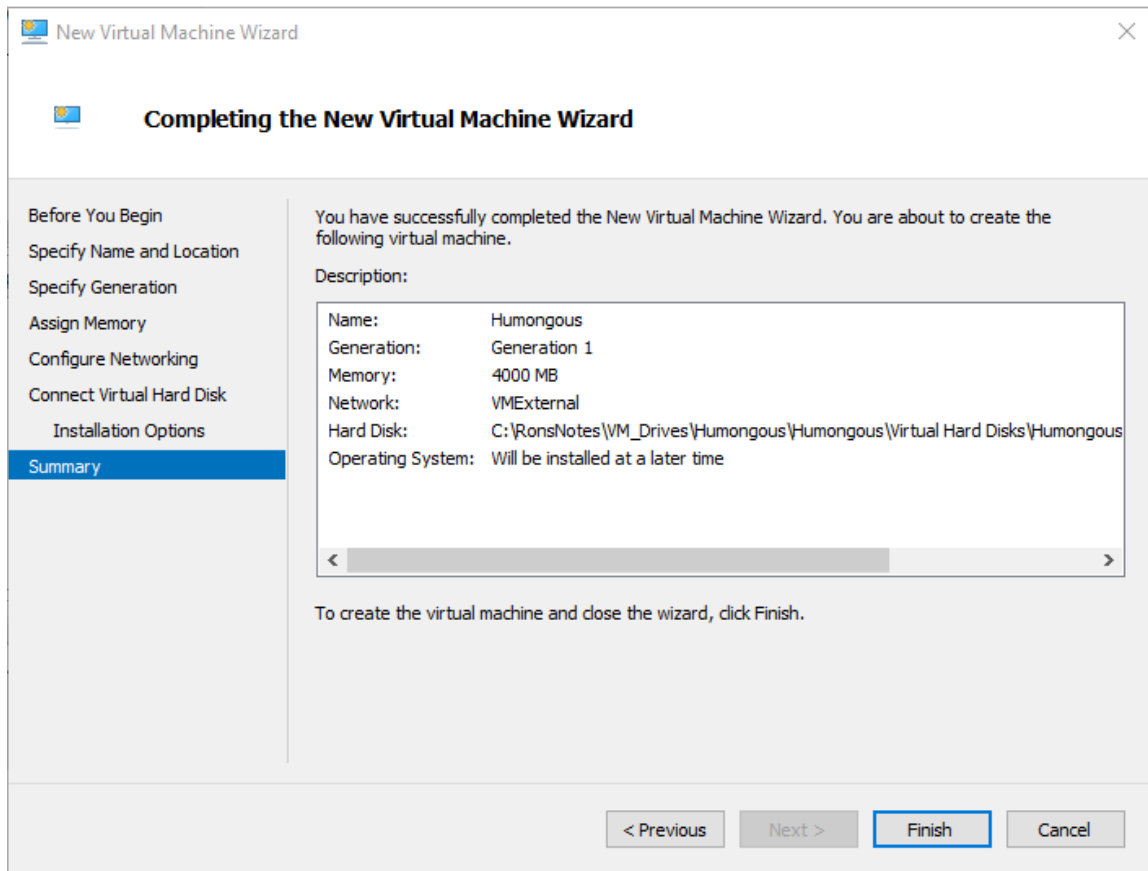
16. Click **Next**.

17. In the **Configure Networking** dialog box, move to the **Connection** setting, use the corresponding drop-down arrow and click to connect to the **VMExternal** adapter.



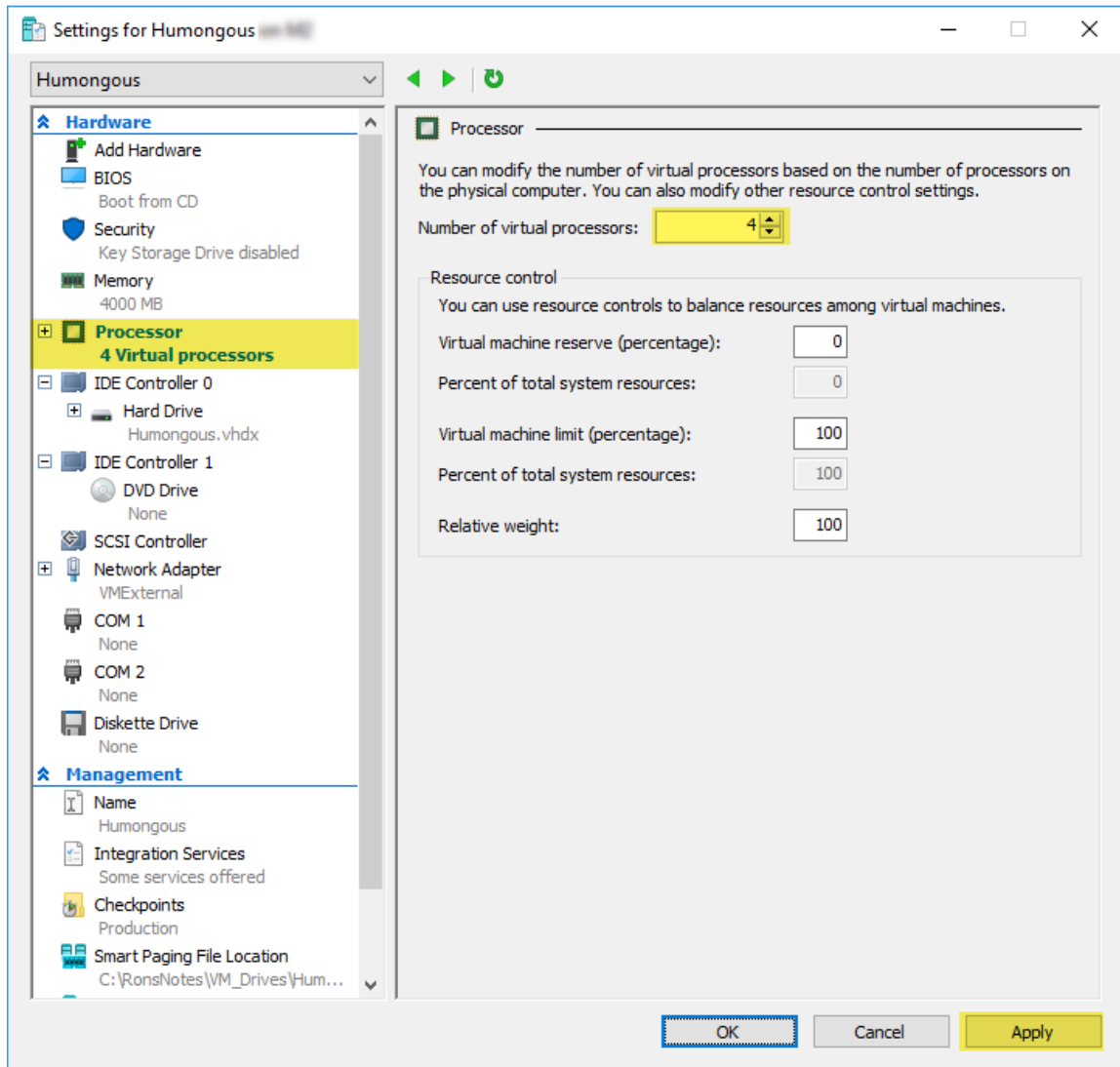
18. Click **Next**.
19. In the **Connect Virtual Hard Disk** dialog box, change the **Size** of the virtual hard disk to **80GB**.
20. Click **Next**.
21. In the **Installation Options** dialog box, review the settings and leave the radio button to **Install an operating system later** selected.
22. Click **Next**.

23. In the **Completing the New Virtual Machine Wizard** dialog box, review the settings, then click **Finish**.

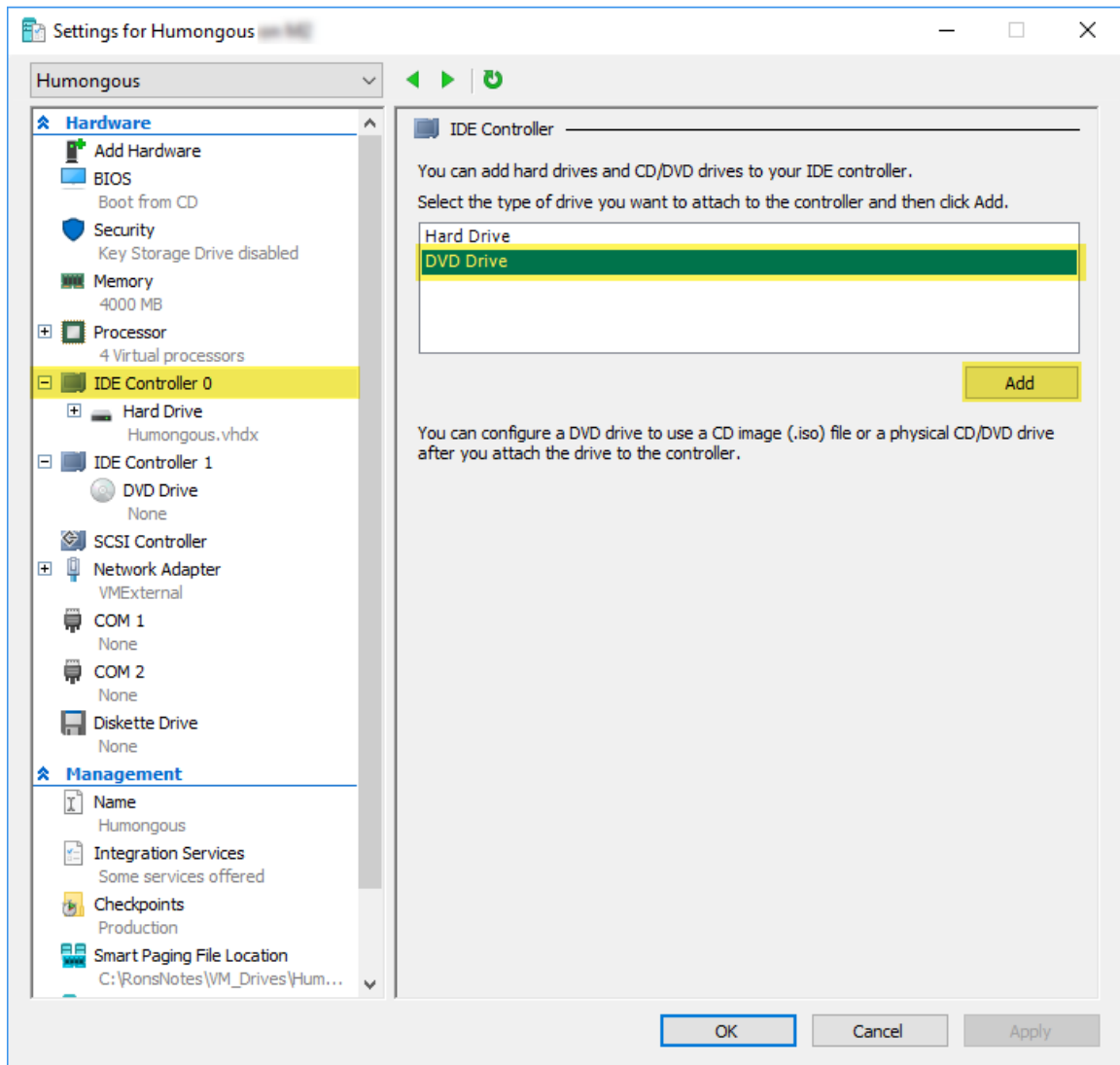


24. In **Hyper-V Manager**, click to select **Humongous** virtual machine, then right-click the machine and select **Settings**....
25. When **Settings for Humongous ...** dialog box opens, review the options available.
26. Navigate to the pane on the left, then locate and click to select **Processor** tab.
27. Verify the **Number of virtual processors** is set to **4**.

28. If changes were made, click **Apply**.

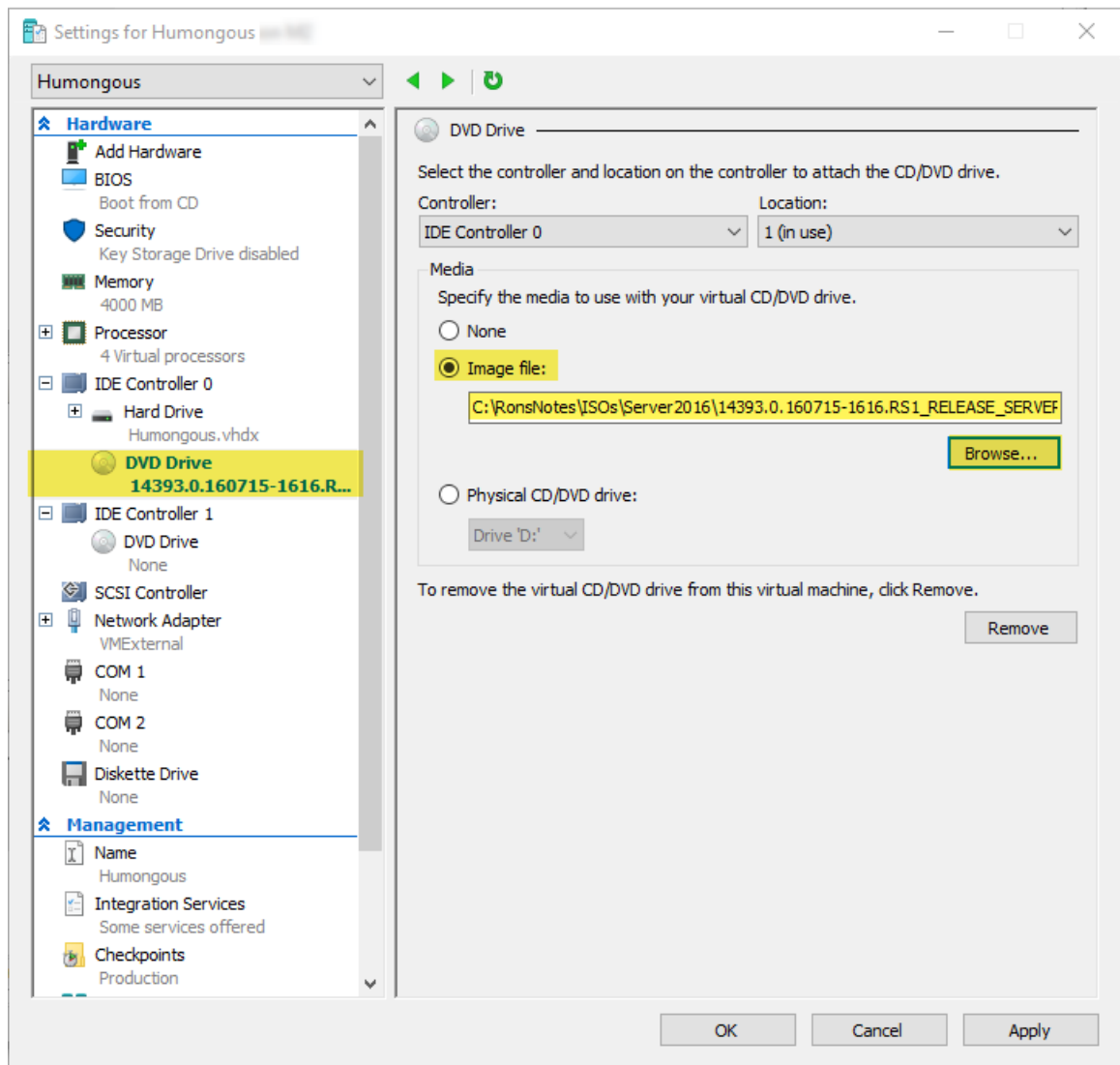


29. Move back to the pane on the left and click to select **IDE Controller 0**.
30. Locate the **Select the type of drive you want to attach to the controller...** setting, click to select **DVD Drive**, then click **Add**.



31. Click the radio button to select an **Image file**, then click the corresponding **Browse....**
32. In the **Open** dialog box, navigate to **C:\RonsNotes\ISOs\Server2016** and double-click the installation ISO.

33. Back in **Settings for Humongous...** dialog box, review the settings.



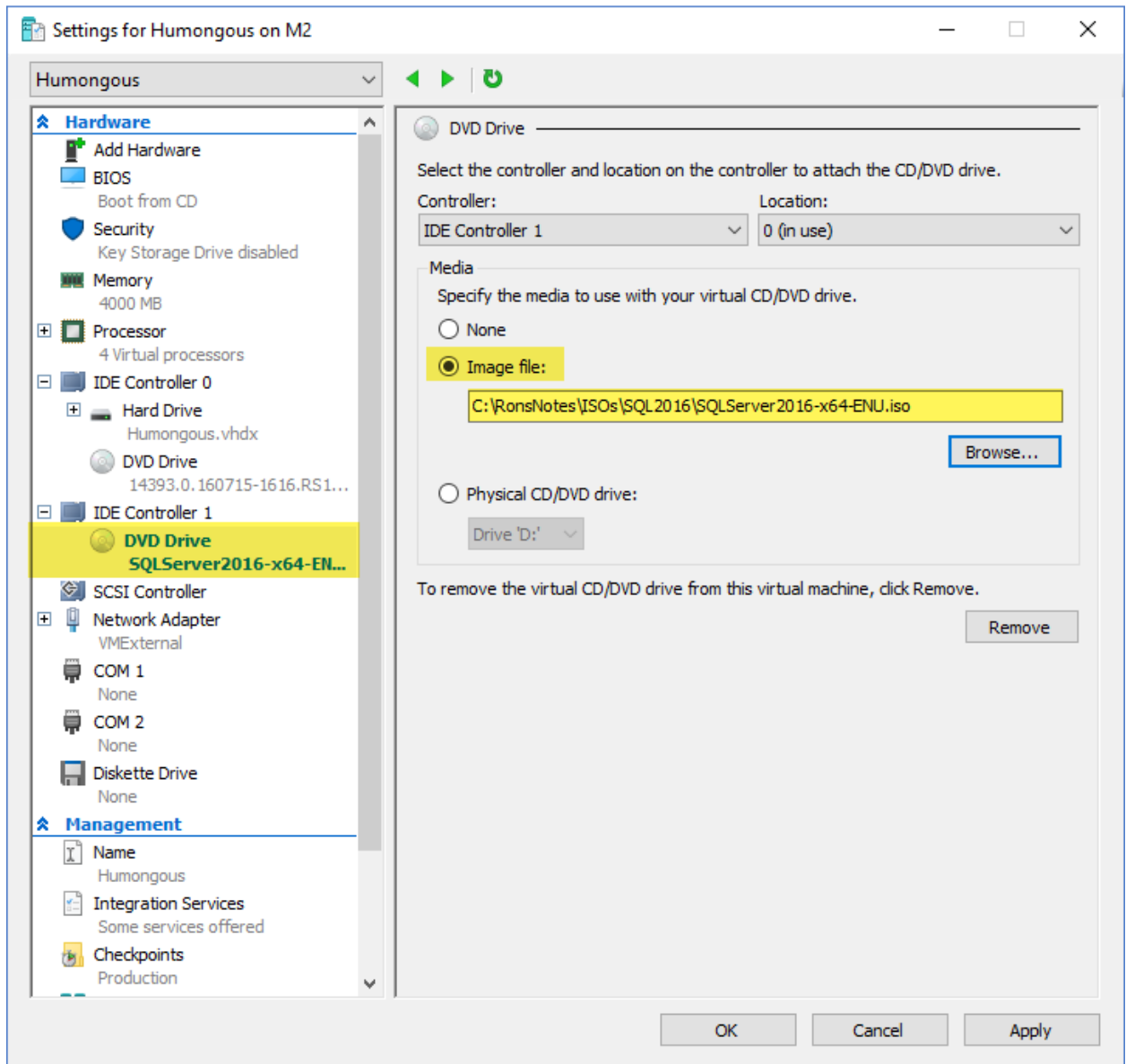
34. Click **Apply**.

35. Move back to the pane on the left and click to select **DVD Drive** below **IDE Controller 1**.

36. Click the radio button to select an **Image file**, then click the corresponding **Browse...**

37. In the **Open** dialog box, navigate to **C:\RonsNotes\ISOs\SQL2016** and double-click the installation ISO.

38. Back in **Settings for Humongous...** dialog box, review the settings.



39. Click **Apply**.

40. Click **OK**.

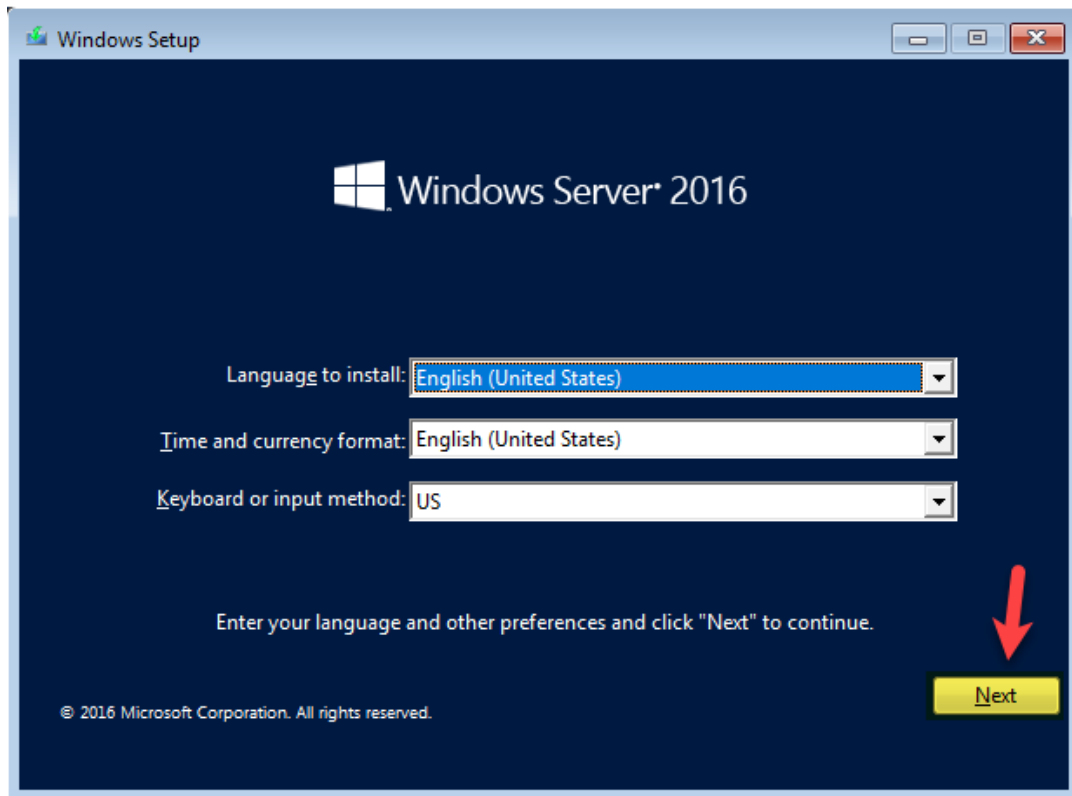
Installing Windows Server 2016

Note: there is no equivalent to this task in PowerShell.

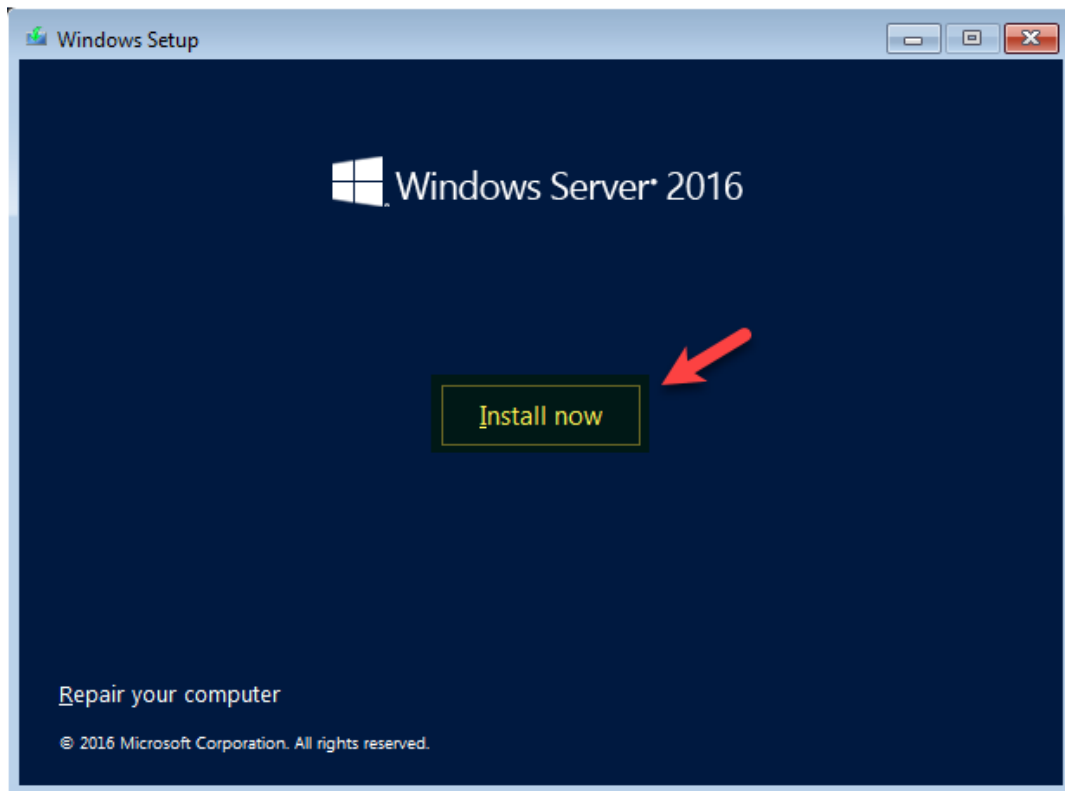
Task: Install Server 2016

1. Right-click the virtual machine (**Humongous**), then click **Start**.
2. Again, right-click the virtual machine (**Humongous**), then click **Connect**.

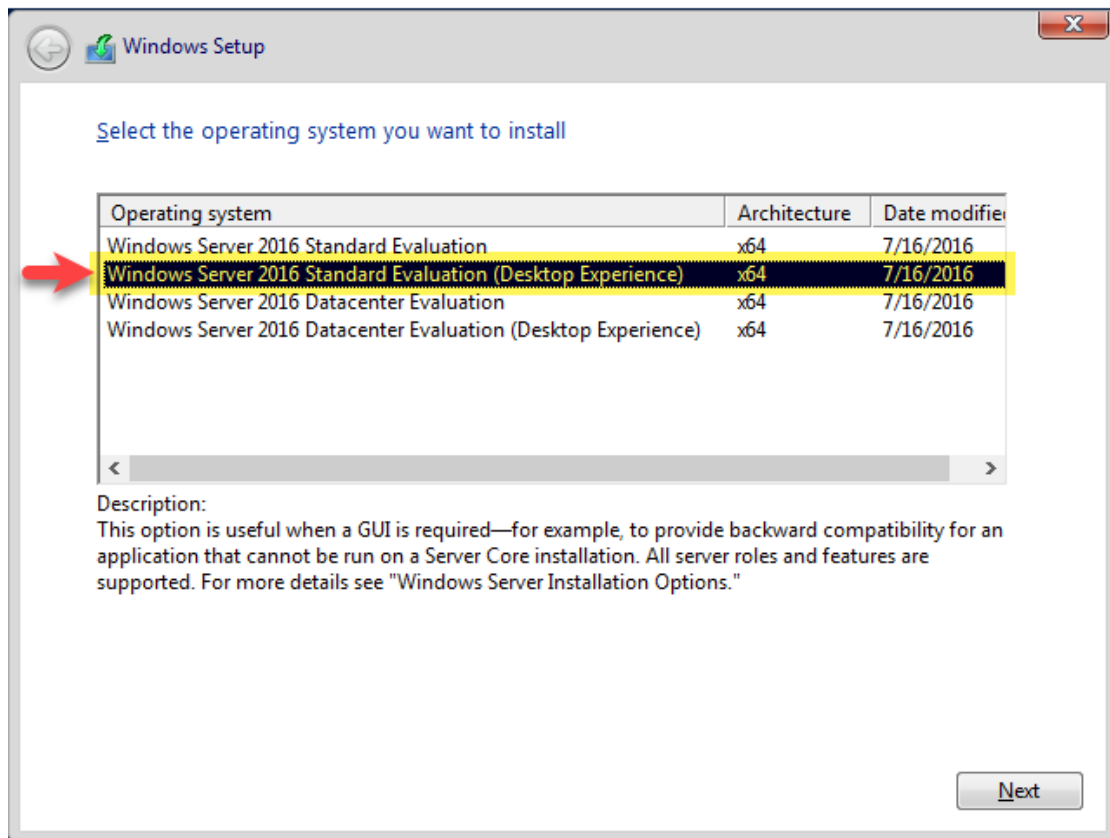
3. In the **Windows Setup** dialog box, review the settings, then click **Next**.



4. Click **Install now**.

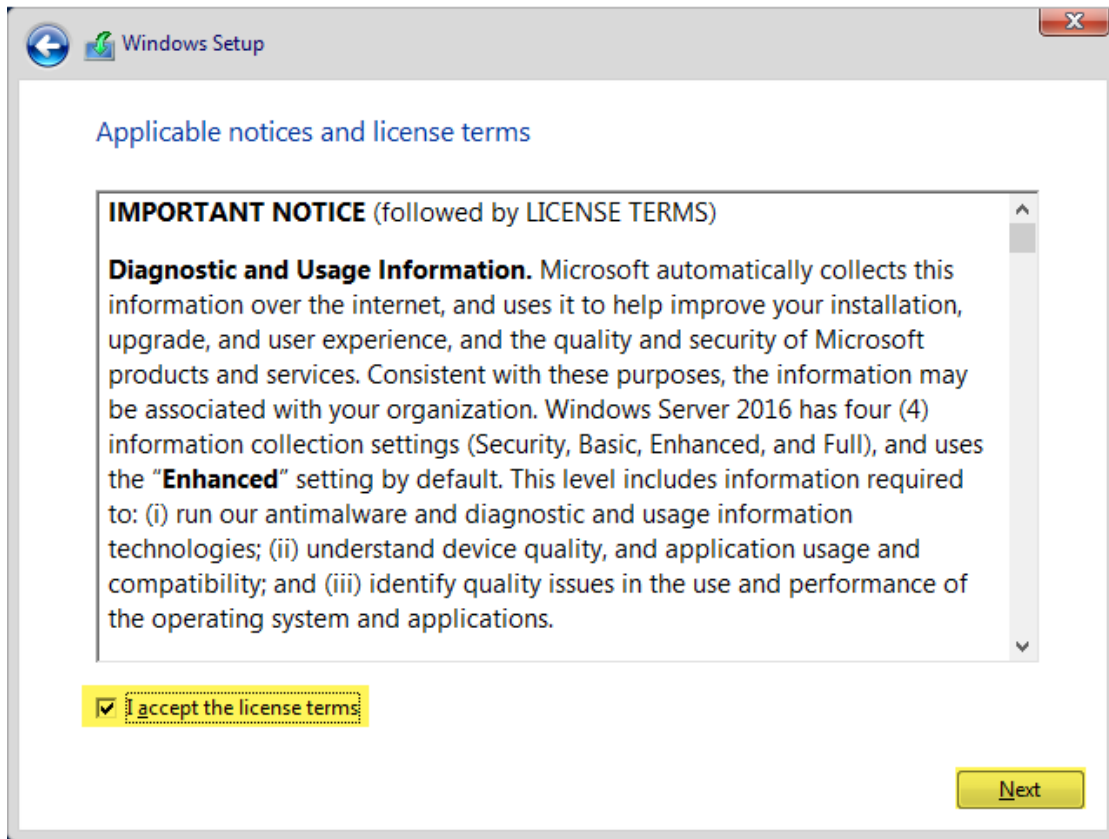


5. In the **Select the operating system you want to install** dialog box, click to select the second option **Windows Server 2016 Standard Evaluation (Desktop Experience)**.

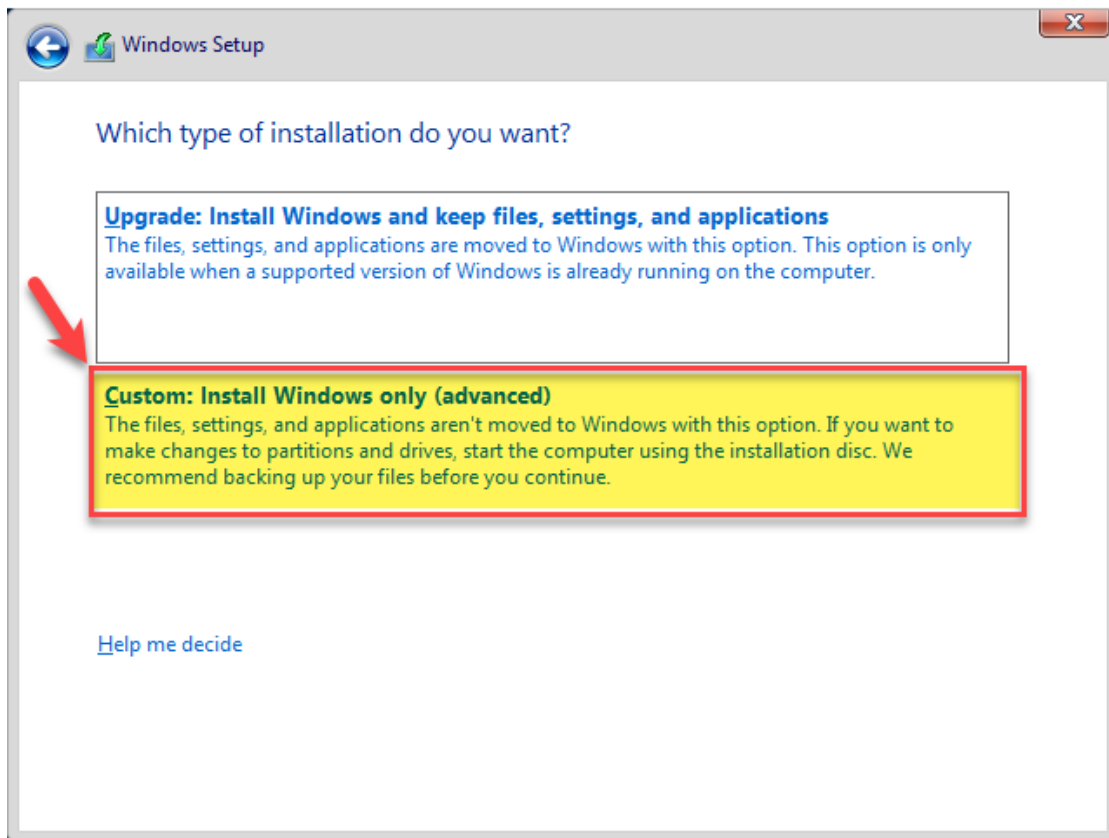


6. Click **Next**.

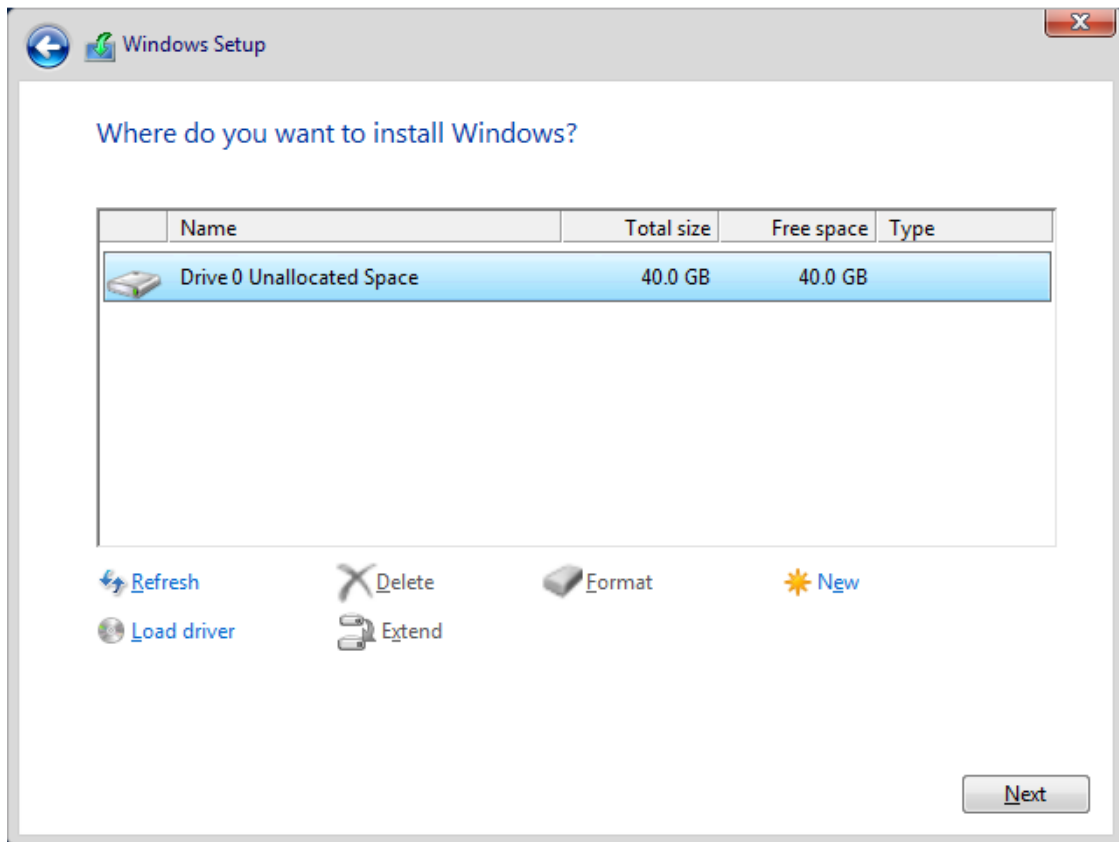
7. Accept the license, then click **Next**.



8. In the **Which type of installation do you want** dialog box, click to select **Custom: Install Windows only (advanced)**.



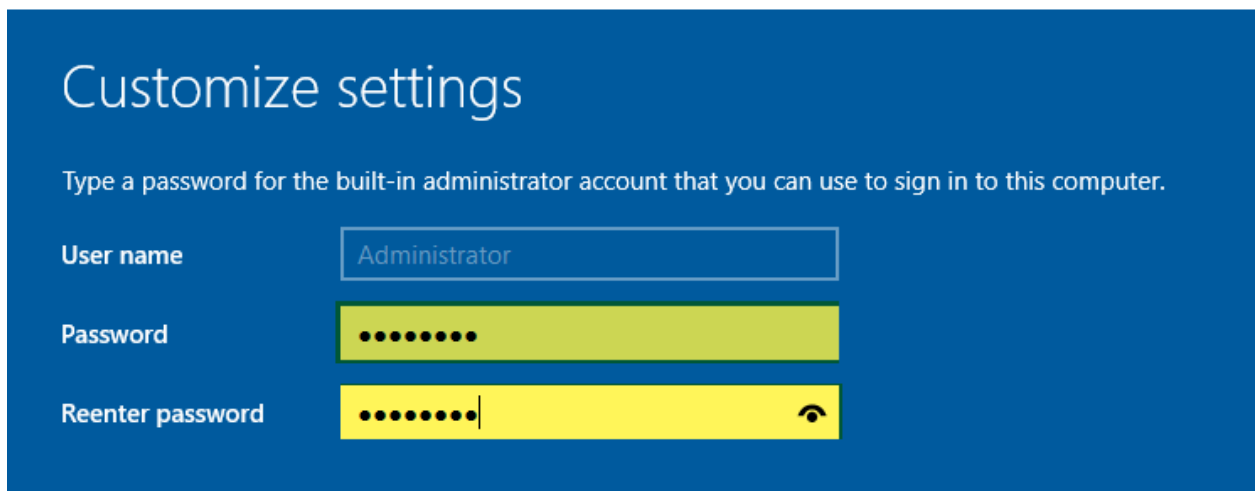
9. When the **Where do you want to install Windows** dialog box opens, review the settings, then click **Next**.




10. Wait for installation to complete.
11. In the **Customize settings** prompt, move to the **Password** text box and enter **Passw0rd**, then reenter the same in the **Reenter password** text box.



The 0 is numeric.

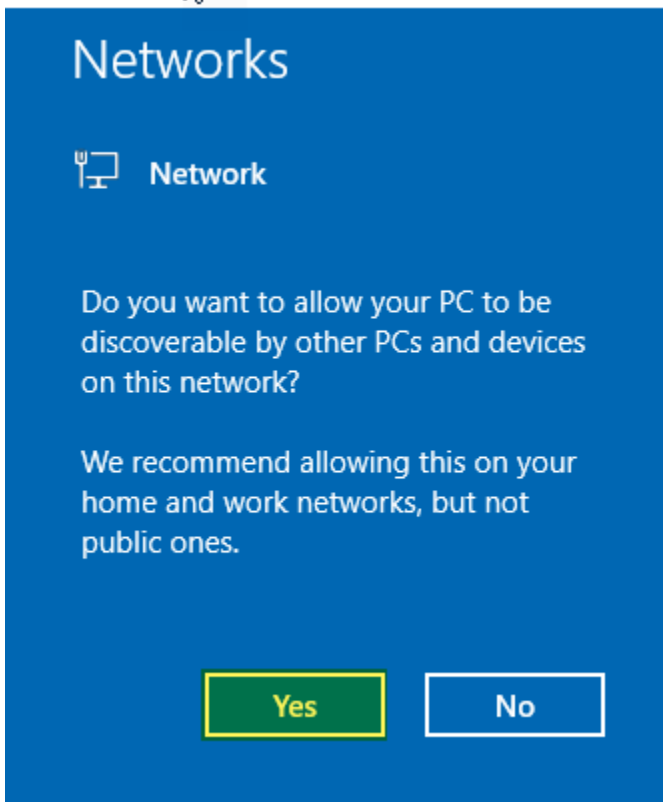


12. Navigate to the lower-right and click **Finish**.

13. Log on to the virtual machine by utilizing the key sequence of **Ctrl+Alt+End**, or by clicking on the **Ctrl+Alt+Delete** icon () in the toolbar.
14. Enter **Passw0rd** into the **Password** prompt to log in as **Administrator**.



15. Allow the virtual machine to fully start (wait for **Server Manager** to open).
16. You will see a prompt on the right asking **Do you want to allow your PC to be discoverable by other PCs and devices on this network**, click **Yes**.





If the virtual machine remains black, then use Hyper-V Manager to shut it down, then restart it.

Optional step:

- a. *You can run update on the virtual machine server. This will take a long time as you need to do it on all of them. We have tested this build with Server 2016 as-is, without any updates, and it all worked, but this is strictly your call.*
- b. *To run an update, open Server Manager, click to select Local Server, then click the corresponding hyperlink to search for and install updates.*

Note. Until we connect these VMs to the internet they will not authenticate meaning you have ten days to get past that phase of the setup.

17. Once Windows Server 2016 is installed successfully, switch to **Hyper-V Manager**, right-click the virtual machine (**Humongous**), then click **Shut Down...**
18. In the dialog box asking, **Are you sure you want to shut down the operating system in the selected virtual machines(s)**, click **Shut Down**.

PHASE 03 DOMAIN SETUP

Phase Objective

In this phase, we will copy files to the virtual machine, then configure the network adapters and build a domain.

Phase Topics

- Enabling Integration Services
- Copying Files to the Individual Virtual Machines
- Renaming the Virtual Machine
- Creating the Domain
- Building out the Domain

Enabling Guest Services on the Virtual Machine

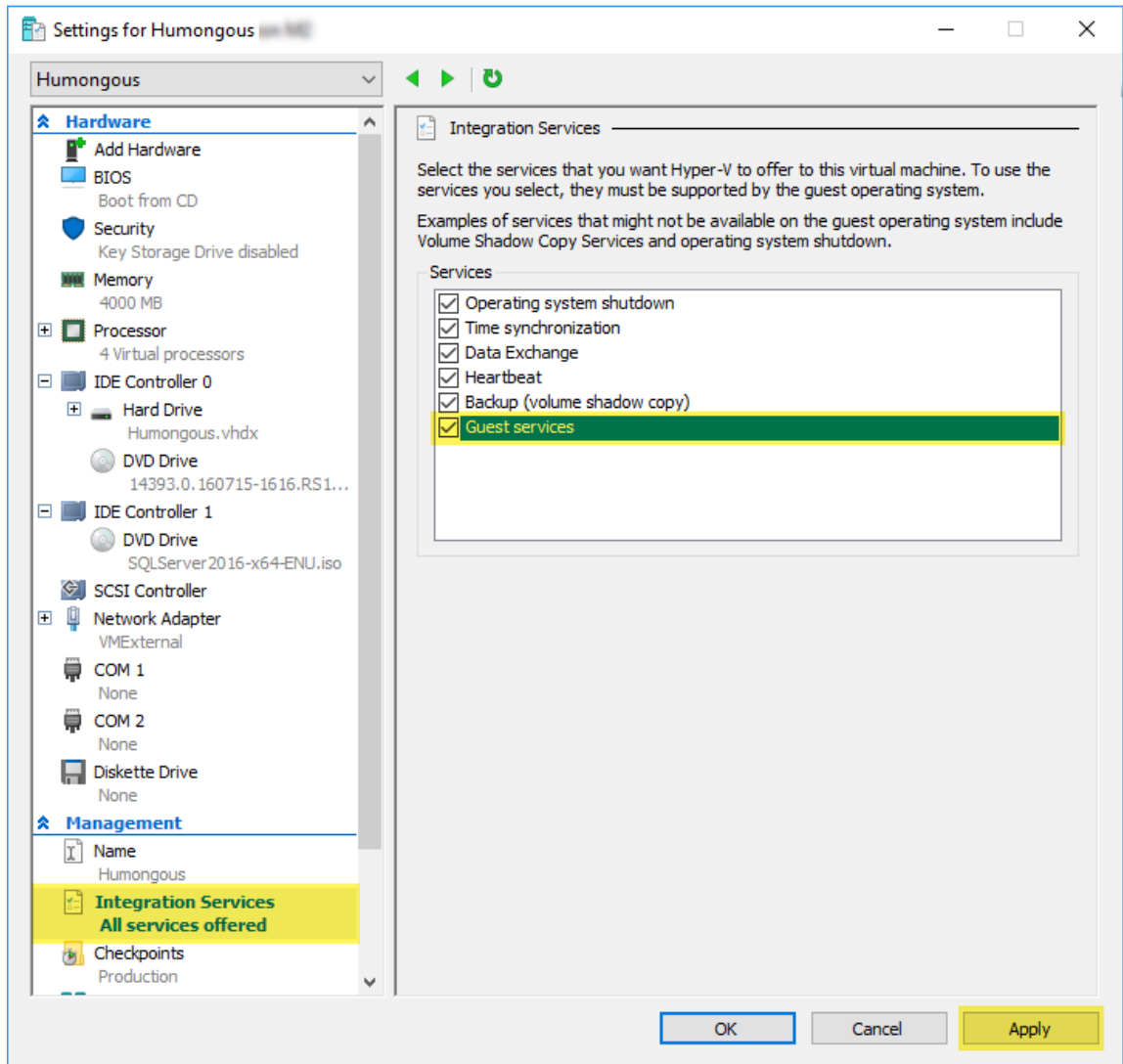
Task: Enabling Guest Services on the Virtual Machine

- If you prefer the PowerShell script instructions for this task, [click here](#).

```
#TASK: ENABLING GUEST SERVICES ON THE VIRTUAL MACHINE
$VMName = "Humongous"
Enable-VMIntegrationService -VMName $VMName -Name "Guest Service Interface"
```

1. In **Hyper-V Manager**, click to select **Humongous**, then right-click the virtual machine and select **Settings...**
2. Move to the pane on the left, then locate and click to select **Integration Services** tab.

3. Verify there is a check in the **Guest services** check box.



4. If changes were made, click **Apply**.
5. Click **OK**.

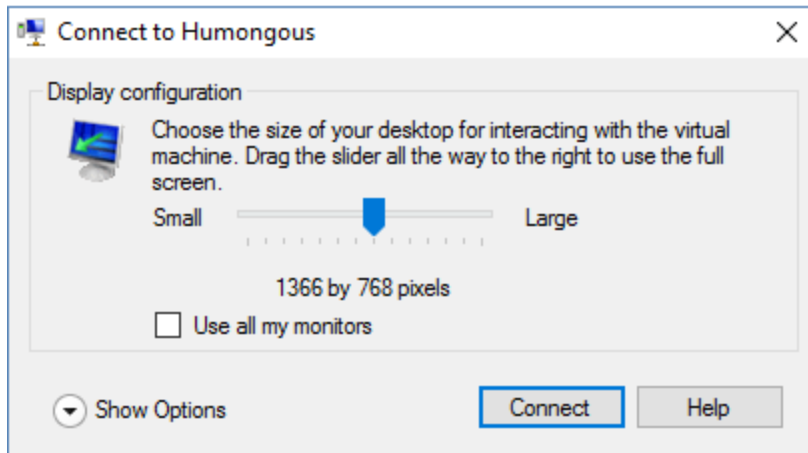
Renaming the Virtual Machine


Task: Renaming the Virtual Machine

- If you prefer the PowerShell script instructions for this task, [click here](#).

```
#TASK: RENAMING THE VIRTUAL MACHINE
Rename-Computer -NewName Humongous -Restart -Force
```

1. Switch to **Hyper-V Manager**.
2. Right-click **Humongous** virtual machine, then click **Start**.
3. Again, right-click **Humongous** virtual machine, then click **Connect**.
4. In **Connect to Humongous** dialog box, review the options available, then click **Connect**.

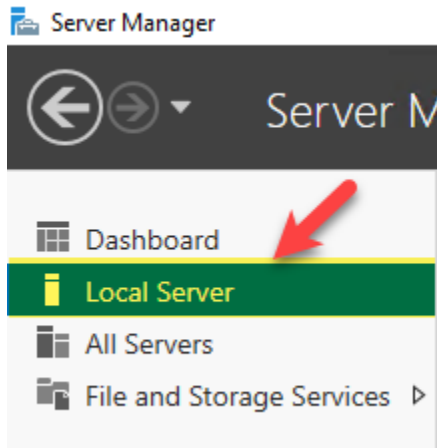


5. Log on to the virtual machine by utilizing the key sequence of **Ctrl+Alt+End**, or by clicking on the **Ctrl+Alt+Delete** icon () in the toolbar.
6. Enter **Passw0rd** into the **Password** prompt to log in as **Administrator**.



7. Allow the virtual machine to fully start (wait for **Server Manager** to open).

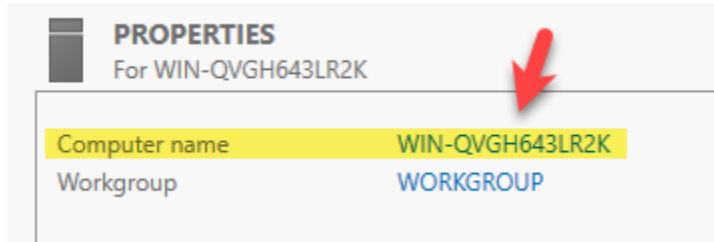
8. When **Server Manager** opens, navigate to the pane on the left and click **Local Server**.



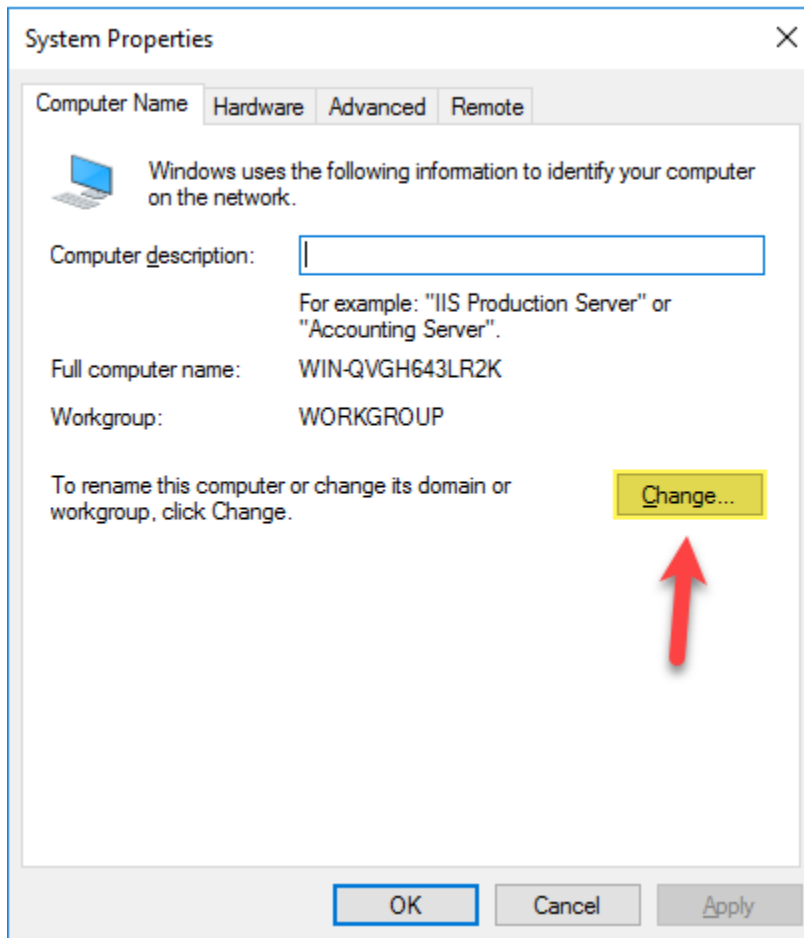
9. Locate the **Computer name** setting, note the current name, then click the corresponding link.



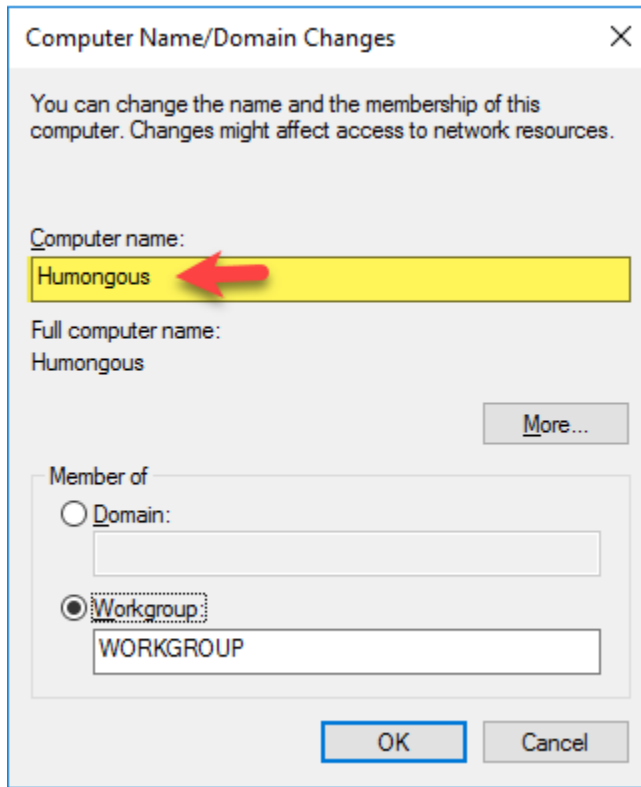
Note: your computer name will not directly match the one shown below.




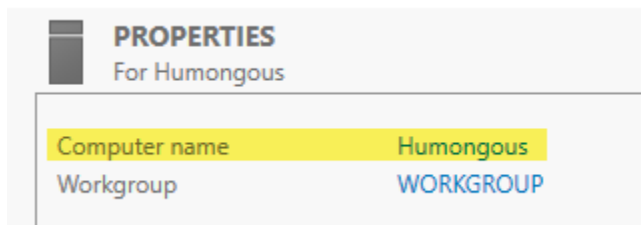
10. In the **System Properties** dialog box, click **Change....**



11. When the **Computer Name/Domain Changes** dialog box opens, move to the **Computer name** text box and enter **Humongous**.



12. Click **OK**.
13. In the dialog box advising **You must restart your computer to apply these changes**, click **OK**.
14. Click **Close**.
15. In the dialog box advising **You must restart your computer to apply these changes**, click **Restart Now**.
16. Wait for the machine to reboot.
17. Log on to the virtual machine by utilizing the key sequence of **Ctrl+Alt+End**, or by clicking on the **Ctrl+Alt+Delete** icon () in the toolbar.
18. Enter **PaSSw0rd** into the **Password** prompt to log in as **Administrator**. (*The 0 is numeric.*)
19. Allow the virtual machine to fully start (wait for **Server Manager** to open).
20. When **Server Manager** opens, navigate to the pane on the left and click **Local Server**.
21. Locate the **Computer name** setting and note the current name.



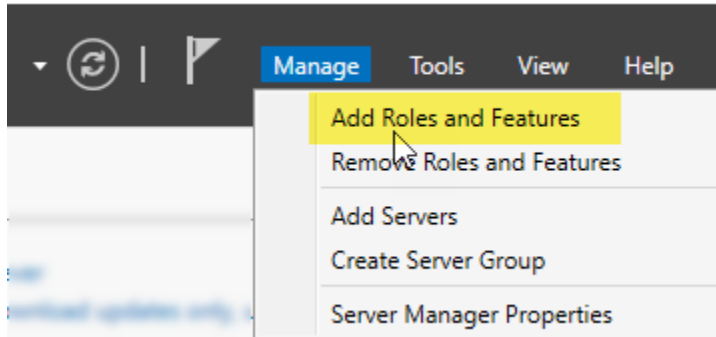
Creating the Domain and Configuring the Forest

Task: Creating the Domain

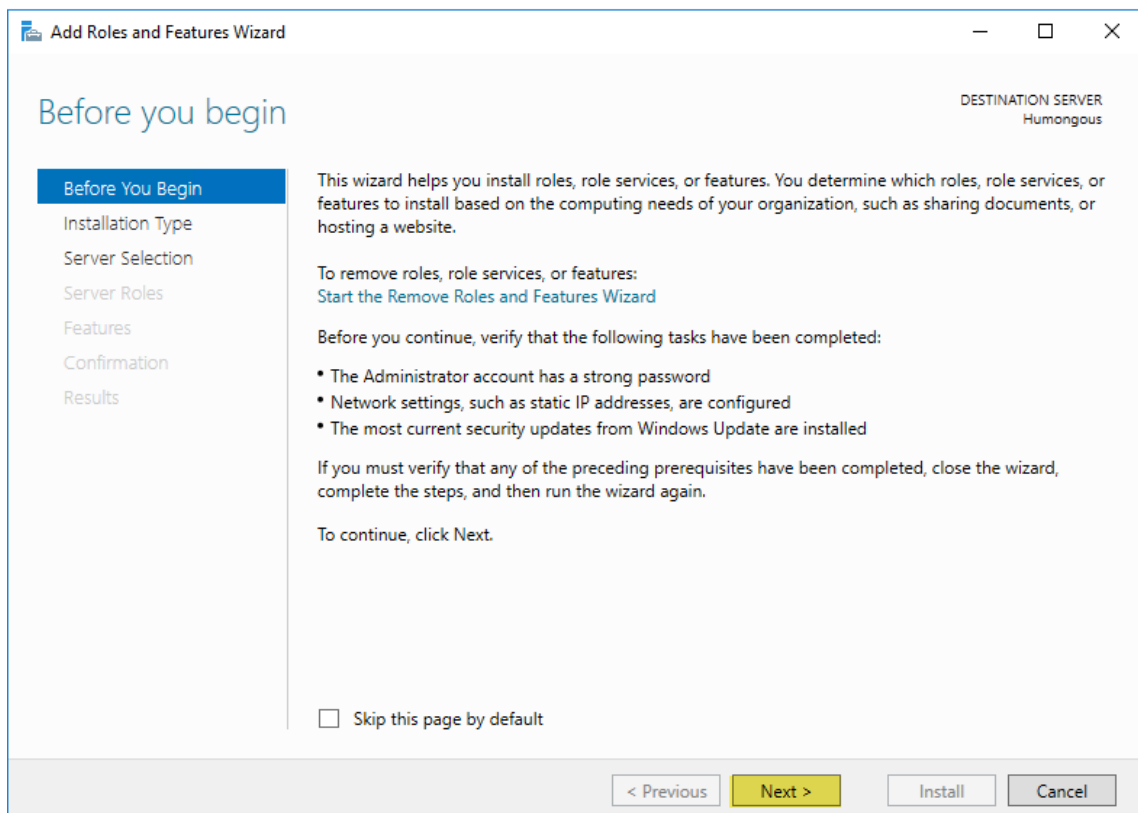
- If you prefer the PowerShell script instructions for this task, [click here](#).

```
#TASK: CREATING THE DOMAIN
Install-windowsfeature -name AD-Domain-Services -IncludeManagementTools
$domain_Name = "RonsNotes.training.local"
$secure_string_pwd = ConvertTo-SecureString "Passw0rd" -asplaintext -Force
```

1. Switch back to **Humongous** virtual machine.
2. In **Server Manager**, navigate up to the menu in the upper-right and click **Manage | Add Roles and Features**.

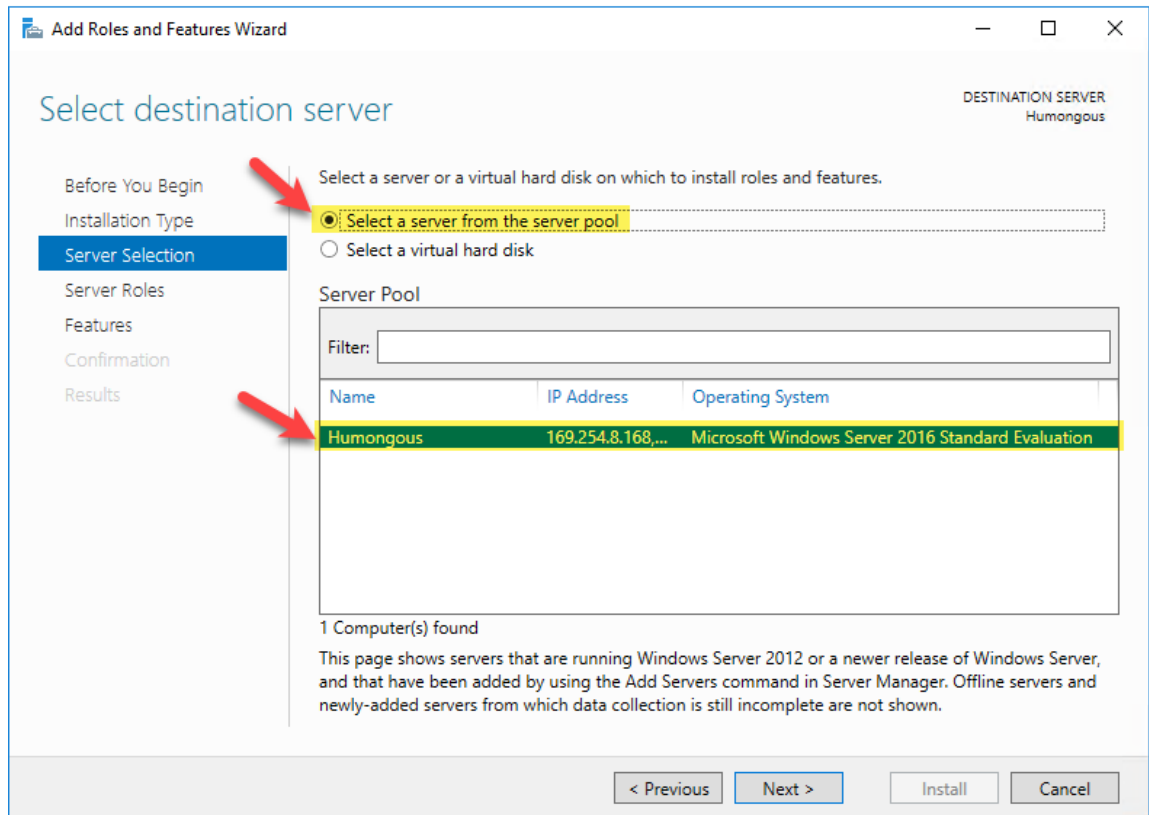


3. In the **Add Roles and Features Wizard** dialog box, review the information given, then click **Next**.

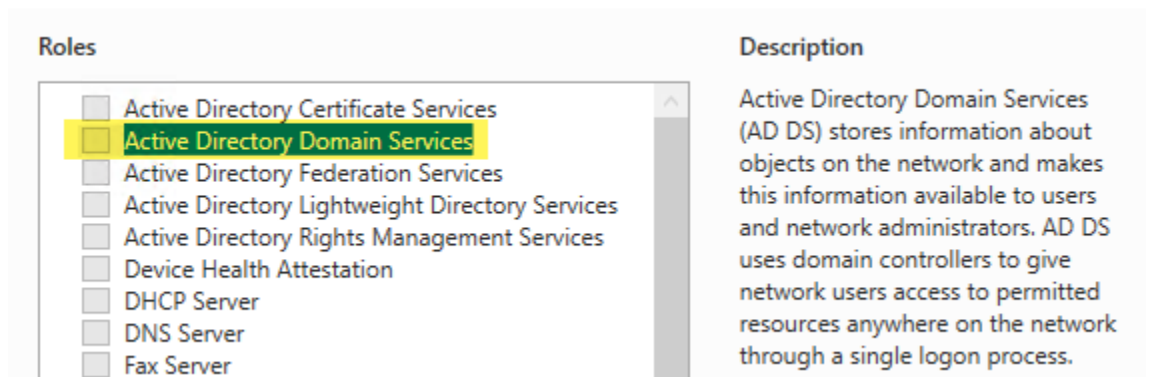


4. In the **Select installation type** dialog box, review the options available, then leave **Role-based or feature-based installation** selected and click **Next**.

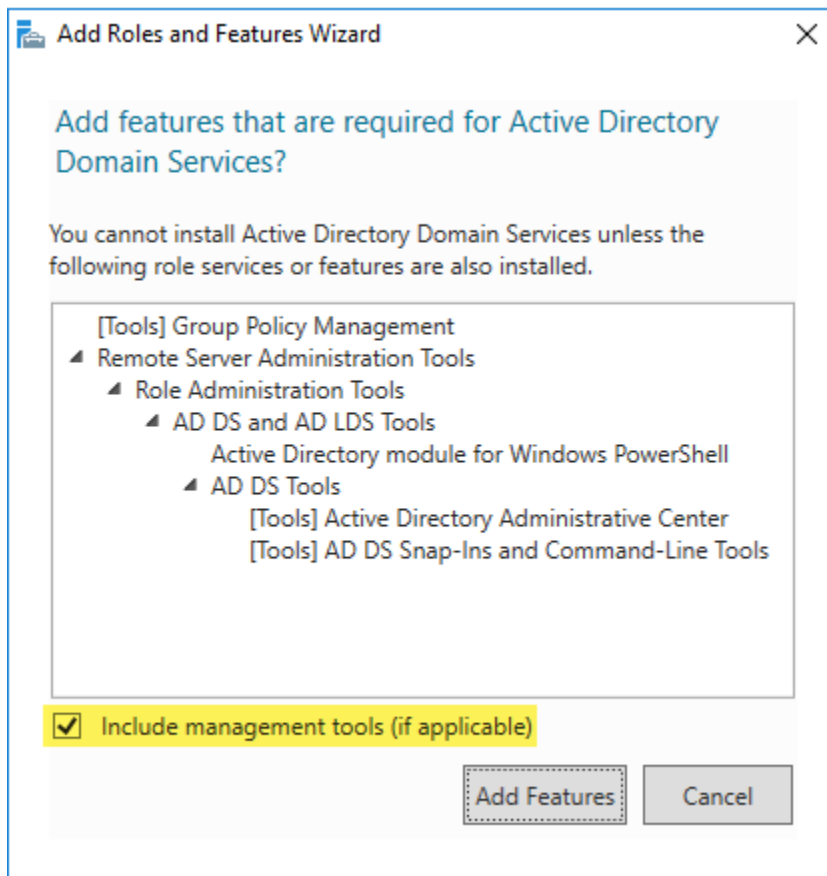
5. When the **Select destination server** dialog box opens, review the options available, then leave the settings as they are (**Humongous** selected) and click **Next**.



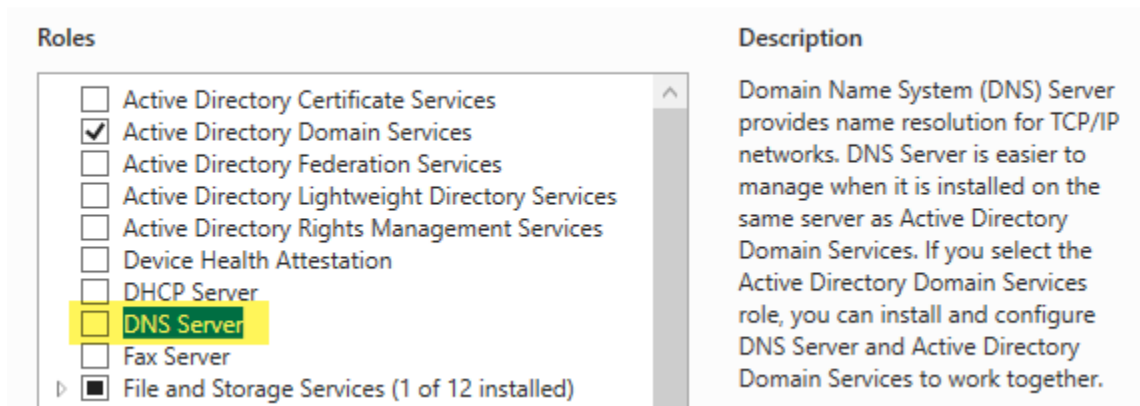
6. In the **Select server roles** dialog box, review the options available, then move to the **Roles** section and place a check in the **Active Directory Domain Services** check box.



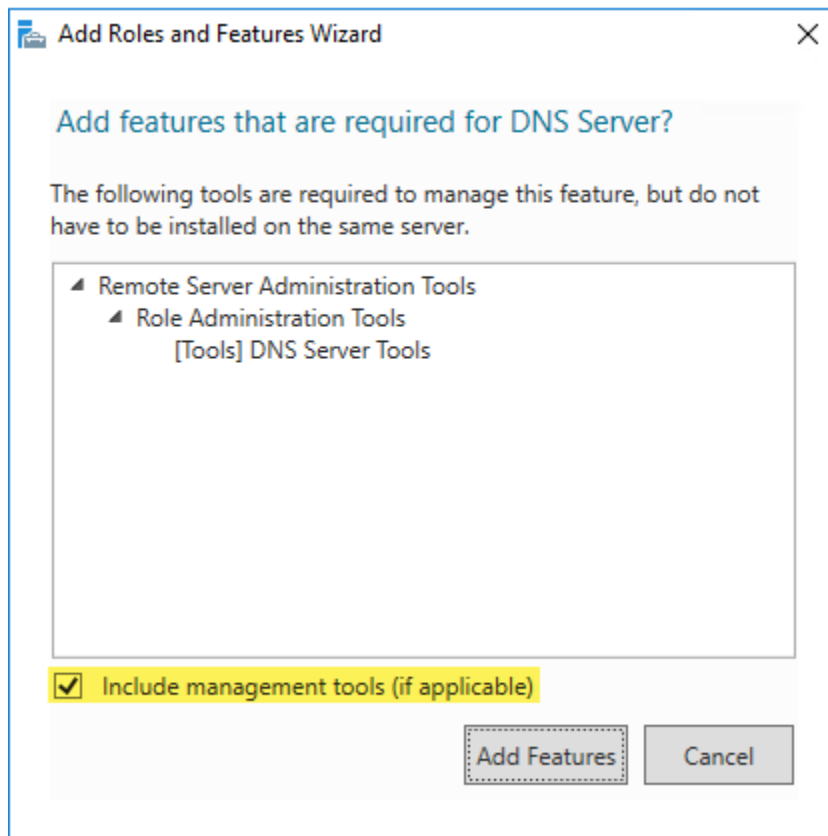
7. When the **Add features that are required for Active Directory Domain Services** dialog box appears, verify there is a check in the **Include management tools (if applicable)** check box.



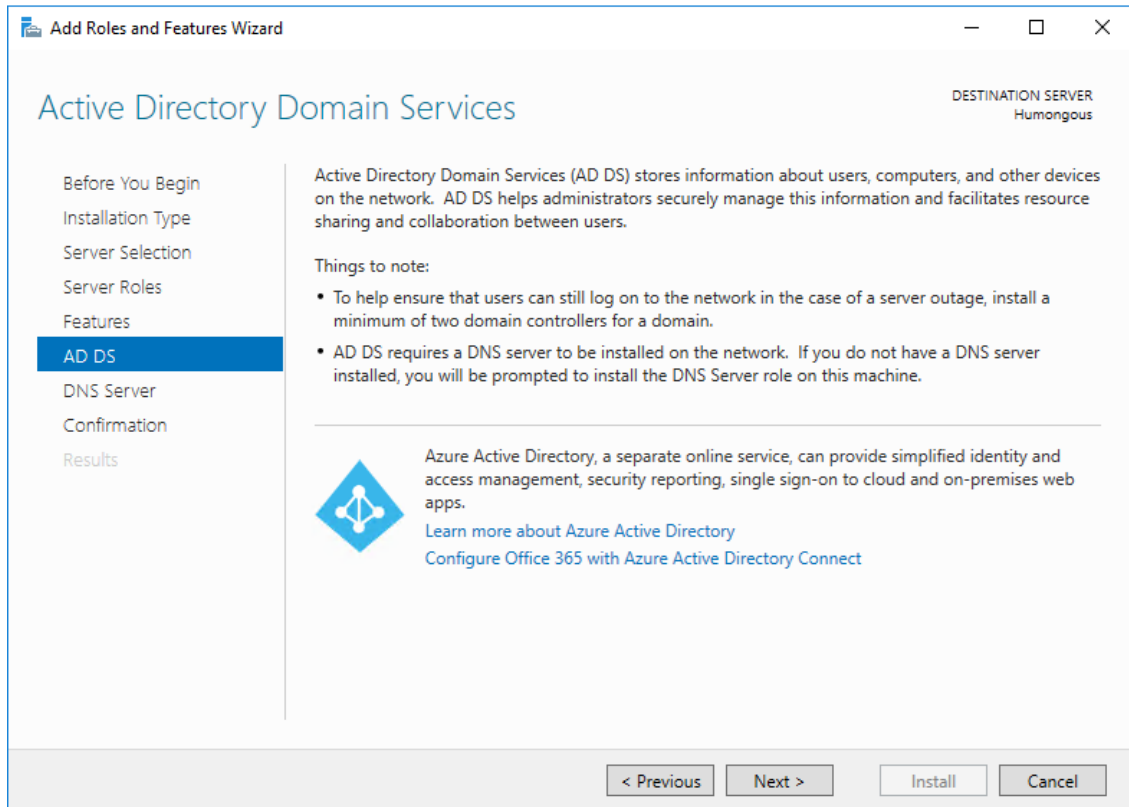
8. Click **Add Features**.
9. Move back to the **Roles** section and place a check in the **DNS Server** check box.



10. When the **Add features that are required for DNS Server** dialog box appears, verify there is a check in the **Include management tools (if applicable)** check box.

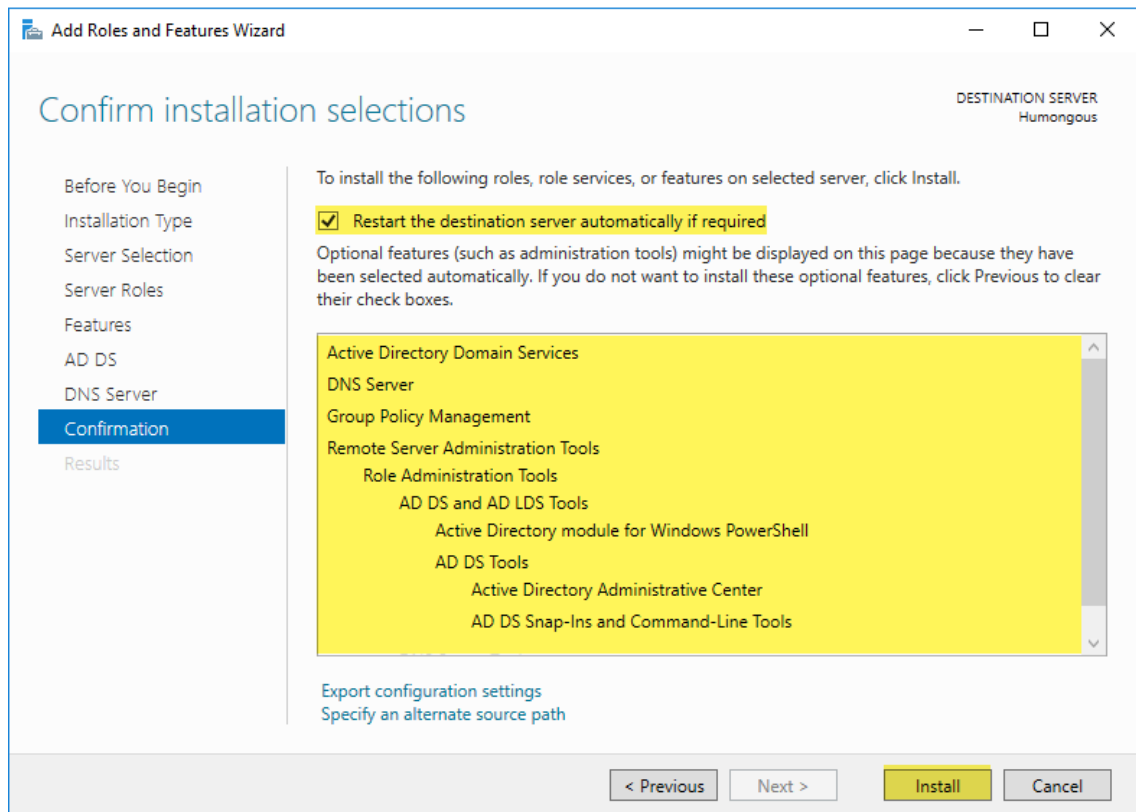


11. Click **Add Features**.
12. Click **Next**.
13. In the **Select features** dialog box, review the options available, then click **Next**.
14. When the **Active Directory Domain Services** dialog box appears, review the information given, then click **Next**.

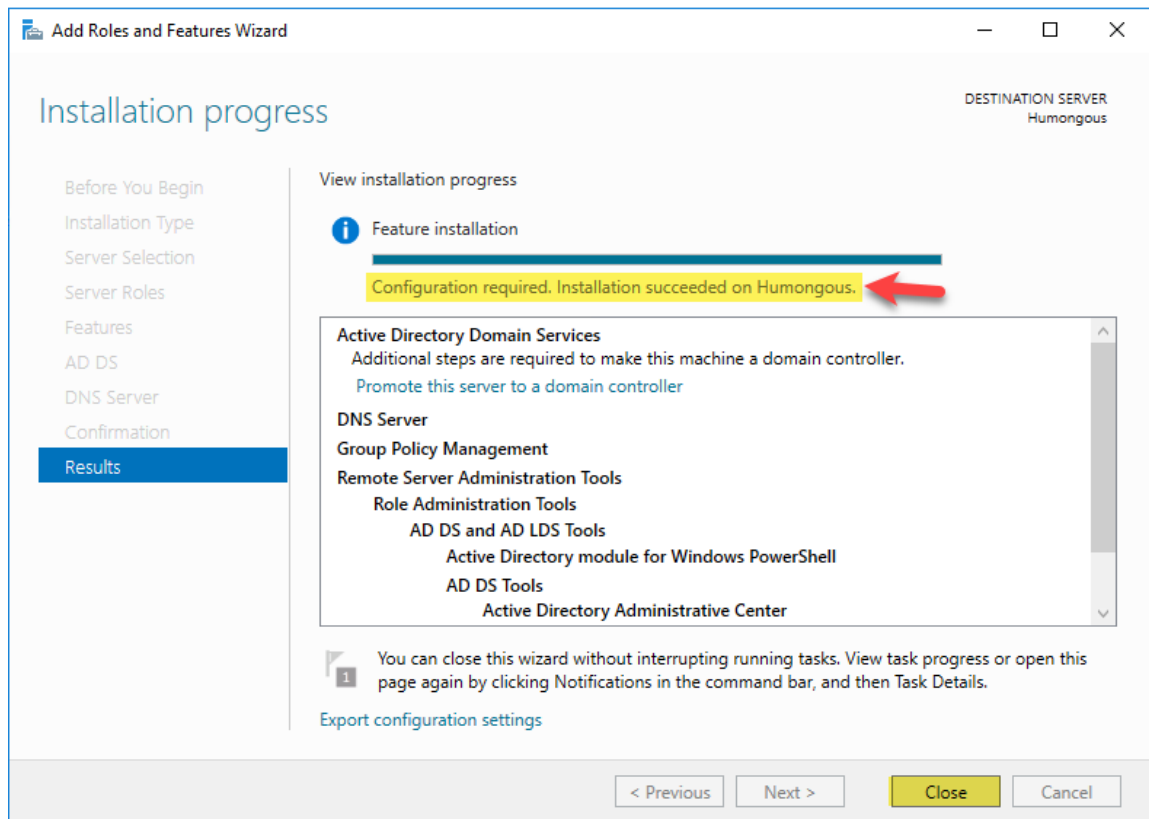


15. In the **DNS Server** dialog box, review the information given, then click **Next**.
16. In the **Confirm installation selections** dialog box, review the settings.
17. Place a check in the **Restart the destination server automatically if required** check box.
18. In the **Add Roles and Features Wizard** dialog box asking **Do you want to allow automatic restarts**, click **Yes**.

19. Back in **Confirm installation selections** dialog box, click **Install**.



20. Upon success, you will see a message advising that **Installation succeeded on Humongous**, then click **Close**.



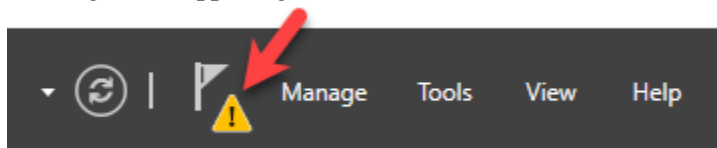
21. If the virtual machine does not reboot, manually reboot the machine.

Task: Configuring the Forest

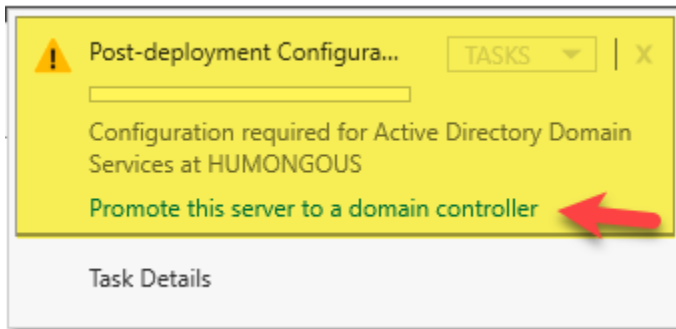
- If you prefer the PowerShell script instructions for this task, [click here](#).

```
#TASK: CONFIGURING THE FOREST
Install-ADDSForest -DomainName $domain_Name -SkipPreChecks -InstallDns:$true
-DomainNetbiosName RonsNotes -SafeModeAdministratorPassword
$secure_string_pwd -Force
```

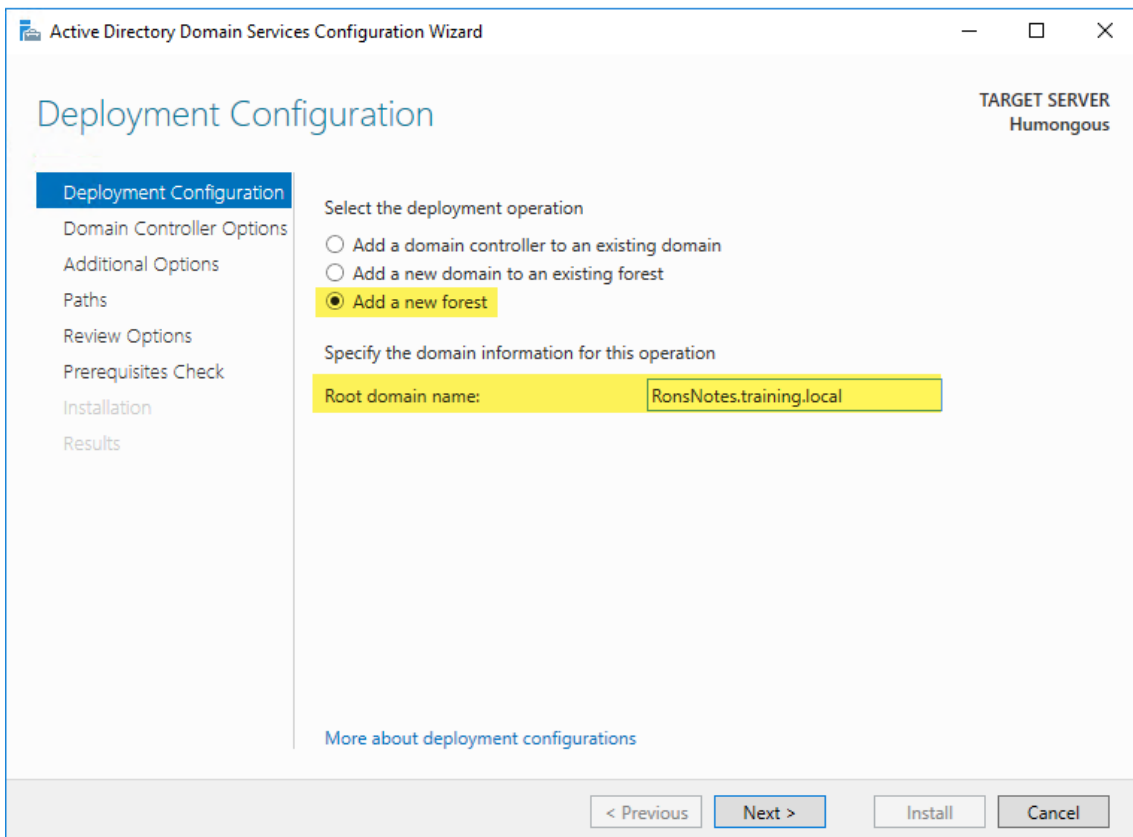
1. Once the machine comes back up from the reboot, back in **Server Manager**, notice a yellow warning in the upper-right.



2. Click the flag, then review the information given and click the **Promote this server to a domain controller** link.



3. In the **Deployment Configuration** dialog box, review the options available, then click the radio button to **Add a new forest**.
4. Move to the **Root domain name** text box and enter **RonsNotes.training.local**.



5. Click **Next**.
6. In the **Domain Controller Options** dialog box, review the current settings.
7. Move to the **Password** text box and enter **PASSw0rd**. (*The 0 is numeric.*)
8. Confirm **PASSw0rd** in the **Confirm password** text box. (*The 0 is numeric.*)

Active Directory Domain Services Configuration Wizard

Domain Controller Options

TARGET SERVER
Humongous

Deployment Configuration
Domain Controller Options
DNS Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results

Select functional level of the new forest and root domain

Forest functional level: Windows Server Technical Previe ▾

Domain functional level: Windows Server Technical Previe ▾

Specify domain controller capabilities

☒ Domain Name System (DNS) server

☒ Global Catalog (GC)

☐ Read only domain controller (RODC)

Type the Directory Services Restore Mode (DSRM) password

Password: ●●●●●●

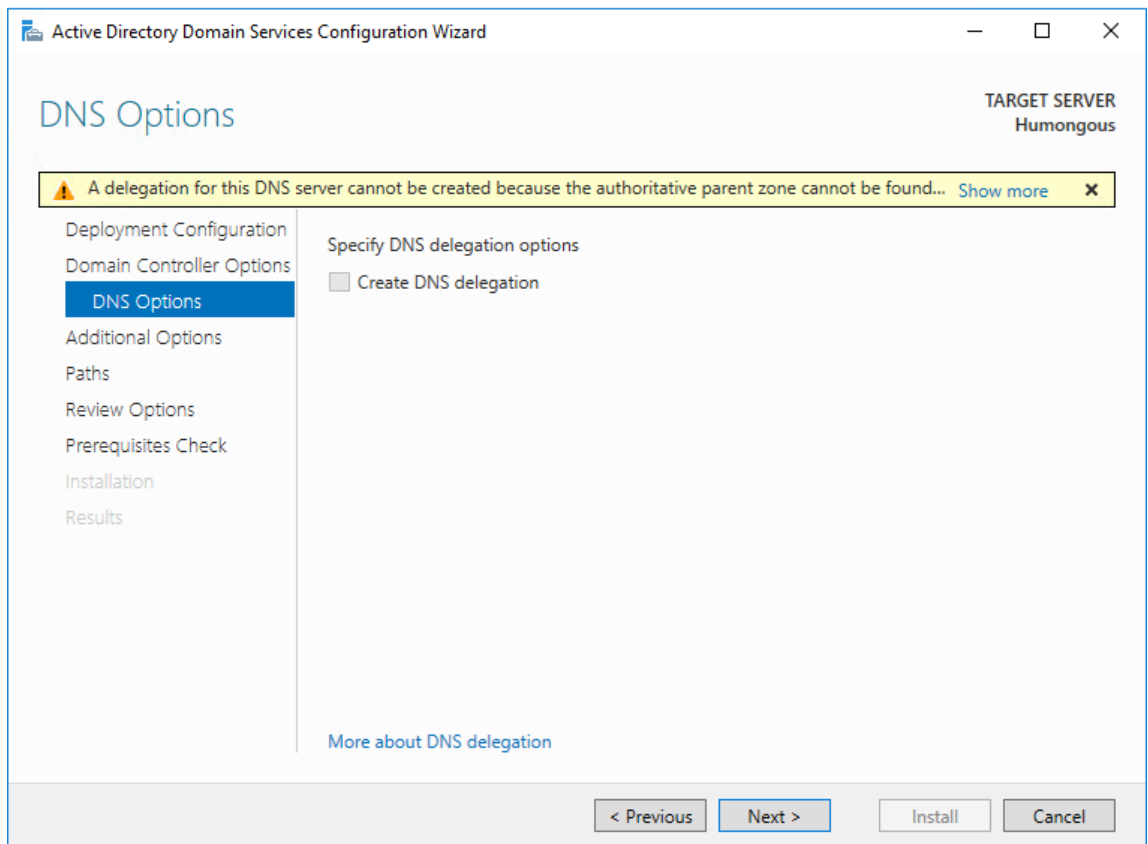
Confirm password: ●●●●●●

[More about domain controller options](#)

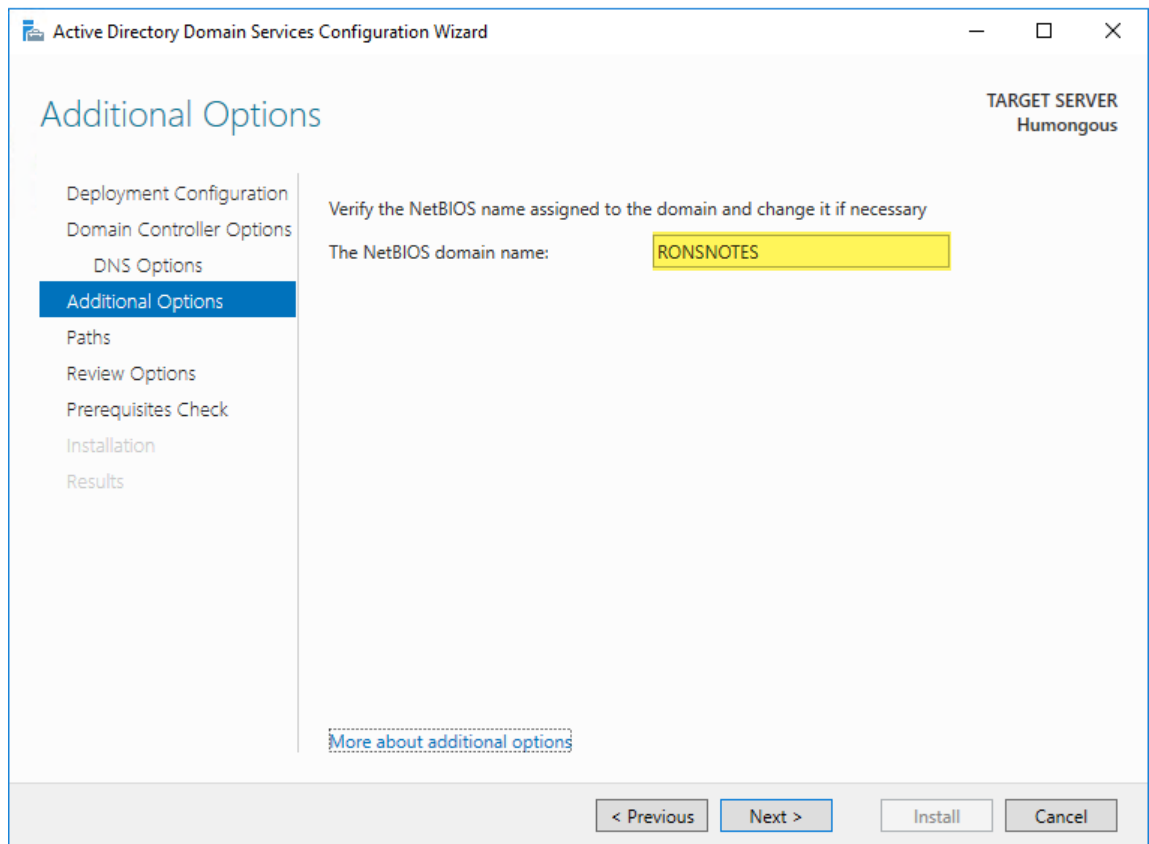
< Previous Next > Install Cancel

9. Click **Next**.

10. In the **DNS Options** dialog box, review the information given, then click **Next**.



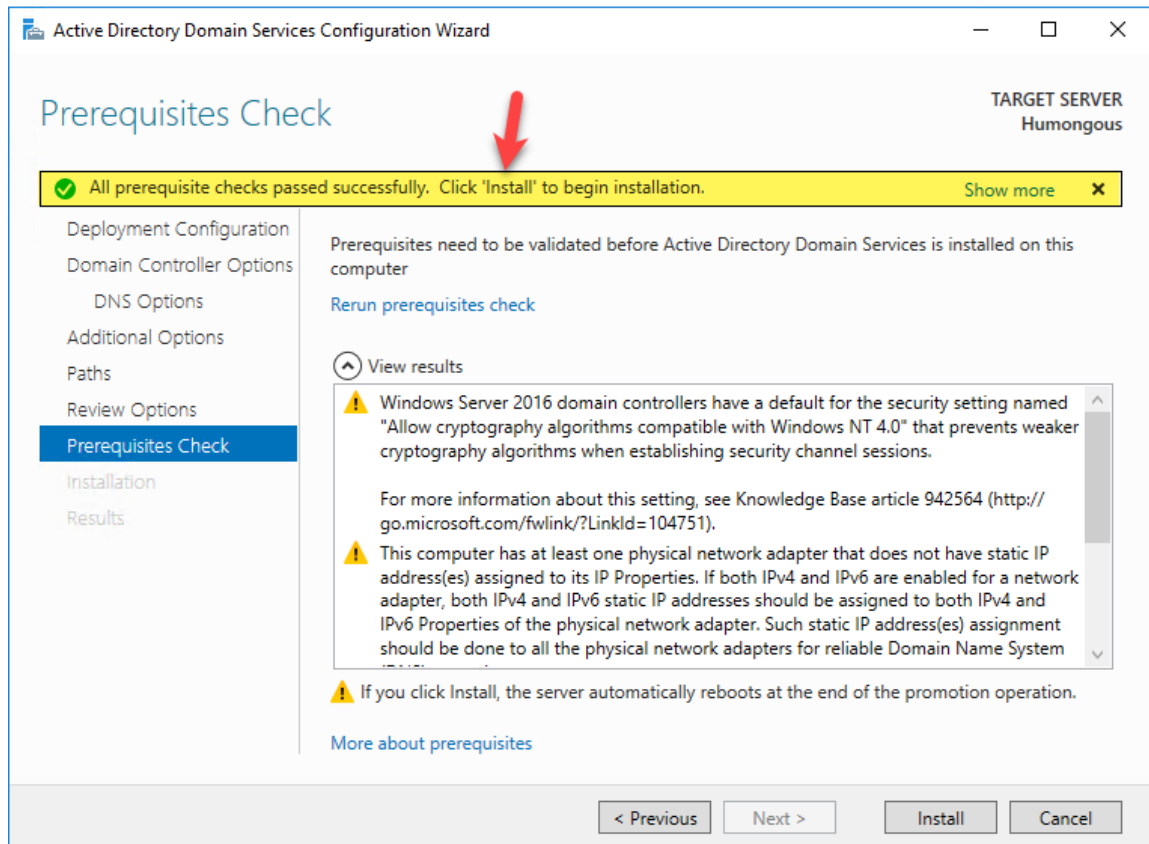
11. In the **Additional Options** dialog box, review the settings, then click **Next**.




12. In the **Paths** dialog box, review the settings, then click **Next**.

13. In the **Review Options** dialog box, review the settings then click **Next**.

14. In the **Prerequisites Check** dialog box, wait for the message to indicate that **All prerequisite checks passed successfully**, then click **Install**.



15. When the **Installation** dialog box appears, wait for installation to complete. Upon success, the virtual machine will restart.
16. When **Humongous** virtual machine starts back up, log on to the virtual machine by utilizing the key sequence of **Ctrl+Alt+End**, or by clicking on the **Ctrl+Alt+Delete** icon () in the toolbar.
17. Enter **PaSSw0rd** into the **Password** prompt to log in as **Administrator**.



18. Allow the virtual machine to fully start (wait for **Server Manager** to open).
19. When **Server Manager** opens, navigate to the pane on the left and click **Local Server**.
20. Locate the **Domain** setting and note the current domain.

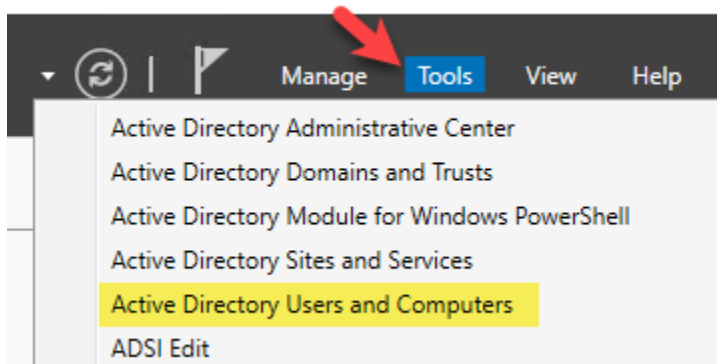


Task: Create Student as Domain Administrator

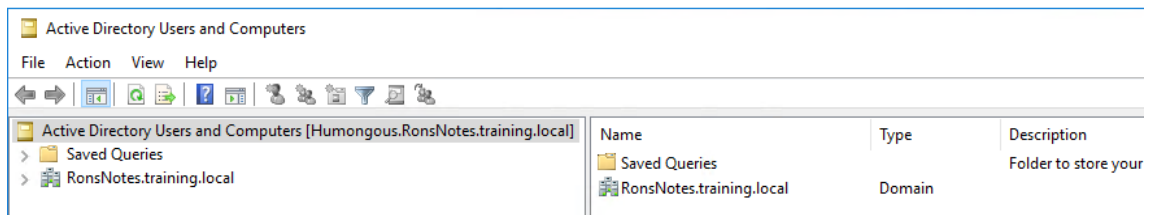
- If you prefer the PowerShell script instructions for this task, [click here](#).

```
#TASK: CREATE STUDENT AS DOMAIN ADMINISTRATOR
New-ADUser -SamAccountName 'Student' -AccountPassword (ConvertTo-SecureString
Passw0rd -AsPlainText -Force) -UserPrincipalName 'Student' -DisplayName 'Student'
-Name 'Student' -Enabled $true
Add-ADGroupMember -Identity 'Enterprise admins' Student
Add-ADGroupMember -Identity 'Domain Admins' Student
```

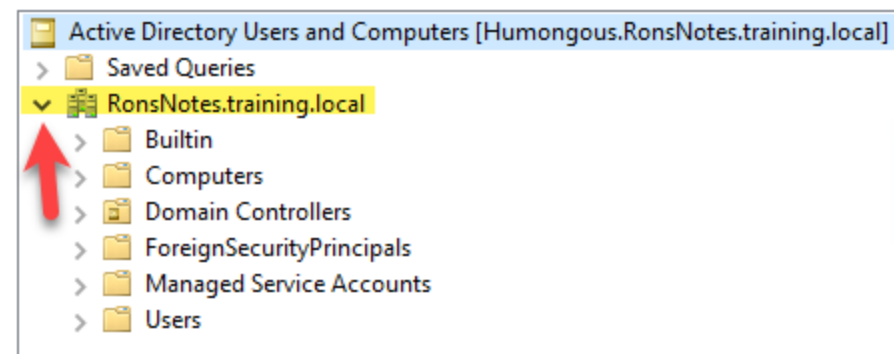
1. In **Humongous**, navigate up to the menu in the upper-right and click **Tools | Active Directory Users and Computers**.



2. When **Active Directory Users and Computers** opens, review the options available.

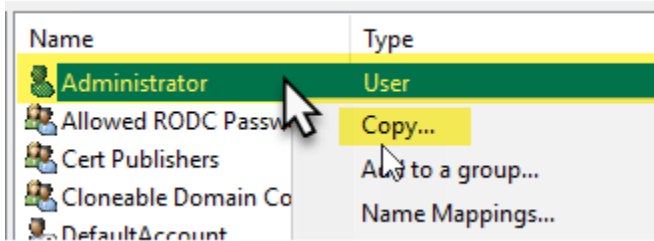


3. Move to the pane on the left and expand **RonsNotes.training.local**.



4. Click to select the **Users** folder.

5. Move to the section in the center, right-click **Administrator** and click **Copy....**

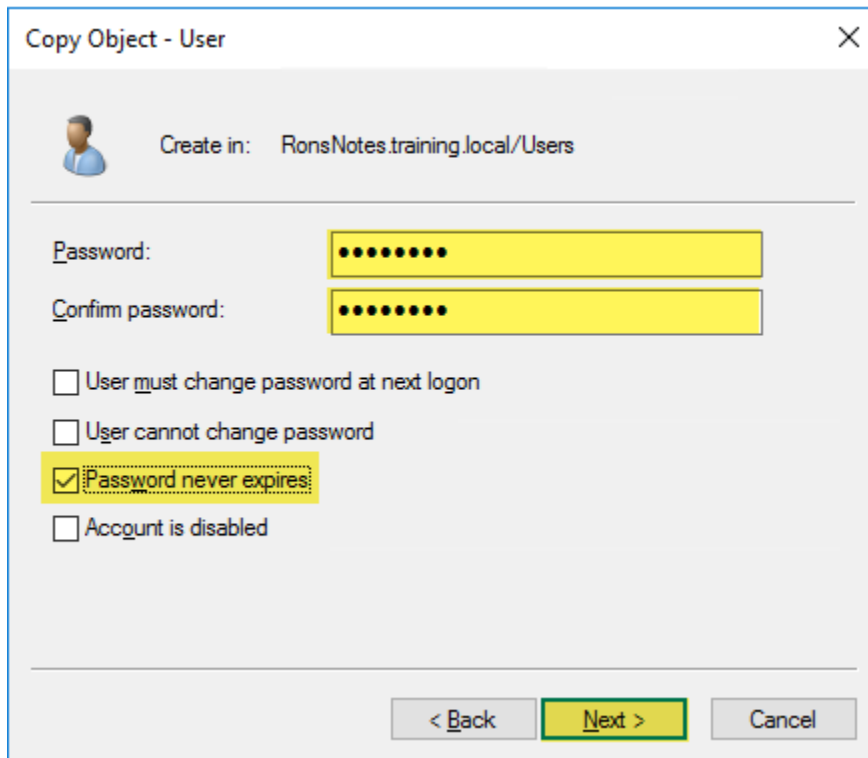


6. In the **Copy Object – User** dialog box, move to the **First name** text box and enter **Student**.
7. Navigate to the **User logon name** text box and enter **Student**.

A screenshot of the 'Copy Object - User' dialog box. The 'Create in:' field shows 'RonsNotes.training.local/Users'. The 'First name:' text box contains 'Student'. The 'Initials:' text box is empty. The 'Last name:' text box is empty. The 'Full name:' text box contains 'Student'. The 'User logon name:' text box contains 'Student'. The 'User logon name (pre-Windows 2000):' section has two text boxes: the first contains 'RONSNOTES\' and the second contains 'Student'. At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'. The 'Next >' button is highlighted.

8. Click **Next**.
9. Move to the **Password** text box and enter **Passw0rd**. (*The 0 is numeric.*)
10. Move to the **Confirm password** text box and enter **Passw0rd**. (*The 0 is numeric.*)

11. Verify there is a check in the **Password never expires** check box.



Copy Object - User

Create in: RonsNotes.training.local/Users

Password: [masked]

Confirm password: [masked]

☐ User must change password at next logon

☐ User cannot change password

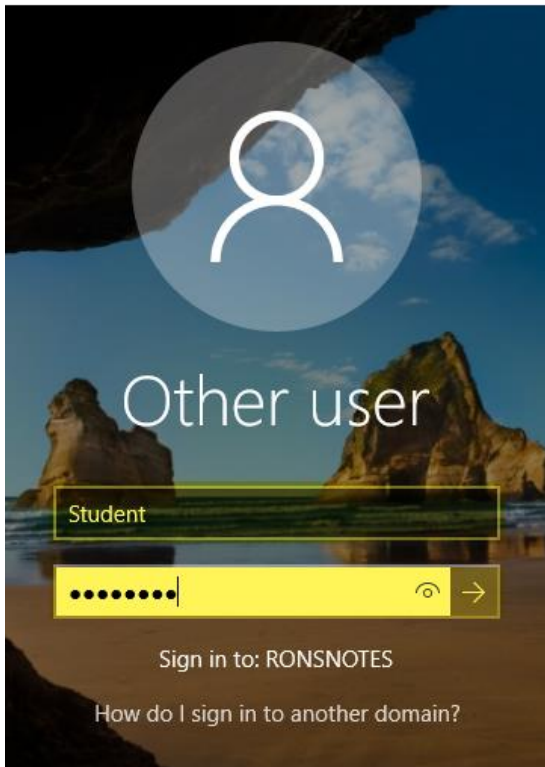
☒ Password never expires

☐ Account is disabled

< Back Next > Cancel

12. Click **Next**.
13. Click **Finish** and notice that **Student** is now listed at the bottom of the list.
14. Close **Active Directory Users and Computers**.
15. Press **Ctrl+Alt+End**.
16. Click **Sign out**.
17. Press **Ctrl+Alt+End**.
18. Navigate to the lower-left and click **Other user**.
19. Move to the **User name** text box and enter **Student**.

20. In the **Password** text box enter Passw0rd.



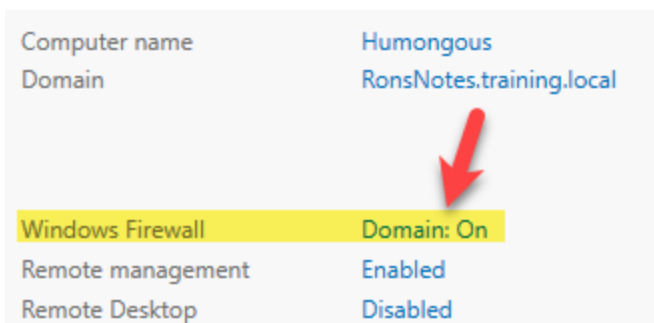
21. Allow the virtual machine to fully start (wait for **Server Manager** to open).

Task: Turn Off the Firewall

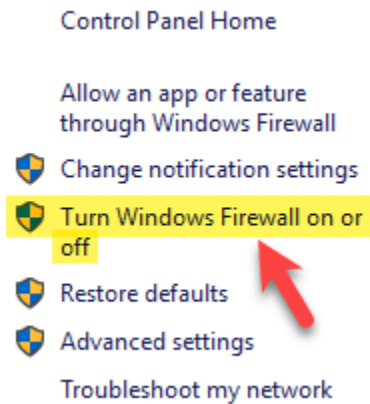
- If you prefer the PowerShell script instructions for this task, [click here](#).

```
#TASK: TURN OFF THE FIREWALL
Set-NetFirewallProfile -Profile domain,Public,Private -Enabled False
```

1. Connect to the virtual machine and log in as **Student**.
2. When **Server Manager** opens, move to the pane on the left and click **Local Server** tab.
3. Move to the **Properties** section in the center, locate the **Windows Firewall** setting and click the **Domain: On** link.



4. Navigate to the pane on the left and click **Turn Windows Firewall on or off**.





5. When **Customize settings for each type of network** opens, review the current settings.



Customize settings for each type of network

You can modify the firewall settings for each type of network that you use.



Domain network settings

-  ☒ Turn on Windows Firewall
- ☐ Block all incoming connections, including those in the list of allowed apps
 - ☐ Notify me when Windows Firewall blocks a new app
-  ☐ Turn off Windows Firewall (not recommended)

Private network settings

-  ☒ Turn on Windows Firewall
- ☐ Block all incoming connections, including those in the list of allowed apps
 - ☐ Notify me when Windows Firewall blocks a new app
-  ☐ Turn off Windows Firewall (not recommended)

Public network settings

-  ☒ Turn on Windows Firewall
- ☐ Block all incoming connections, including those in the list of allowed apps
 - ☐ Notify me when Windows Firewall blocks a new app
-  ☐ Turn off Windows Firewall (not recommended)

6. Click the radio button to **Turn off Windows Firewall** for all three network settings:
 - Domain
 - Private
 - Public

Customize settings for each type of network

You can modify the firewall settings for each type of network that you use.

Domain network settings



☐ Turn on Windows Firewall

☐ Block all incoming connections, including those in the list of allowed apps

☐ Notify me when Windows Firewall blocks a new app



☒ Turn off Windows Firewall (not recommended)

Private network settings



☐ Turn on Windows Firewall

☐ Block all incoming connections, including those in the list of allowed apps

☐ Notify me when Windows Firewall blocks a new app



☒ Turn off Windows Firewall (not recommended)

Public network settings



☐ Turn on Windows Firewall

☐ Block all incoming connections, including those in the list of allowed apps

☐ Notify me when Windows Firewall blocks a new app



☒ Turn off Windows Firewall (not recommended)

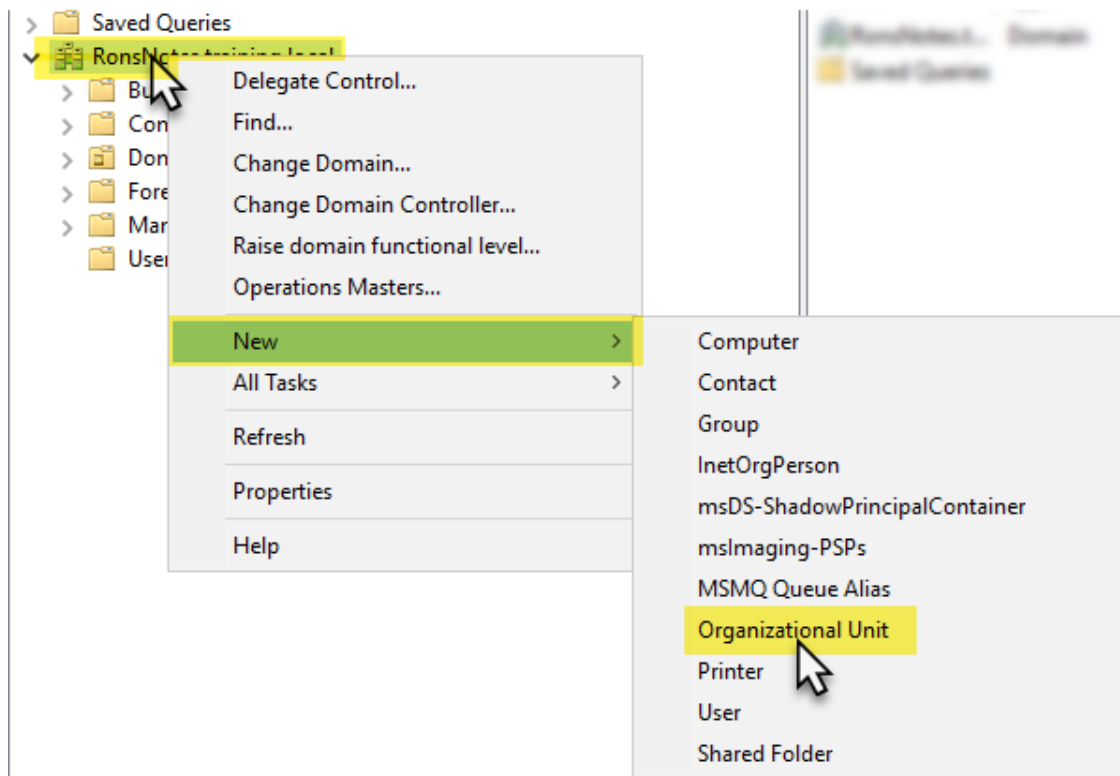
7. Click **OK**.
8. Close **Control Panel**.

Task: Create Organizational Units

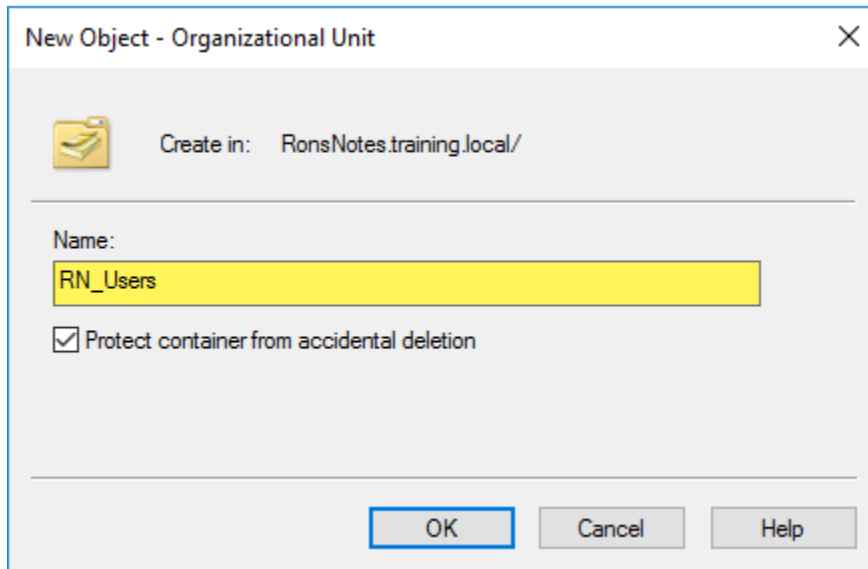
- If you prefer the PowerShell script instructions for this task, [click here](#).

```
#TASK: CREATE ORGANIZATIONAL UNITS
Function Create-OUs{
New-ADOrganizationalUnit -Name sharepoint_svrs -Path "DC=RonsNotes, DC=Training,
DC=Local"
New-ADOrganizationalUnit -Name SQL_Svrs -Path "DC=RonsNotes, DC=Training,
DC=Local"
New-ADOrganizationalUnit -Name RN_Users -Path "DC=RonsNotes, DC=Training,
DC=Local"
New-ADOrganizationalUnit -Name SP_Owners -Path "OU=RN_Users, DC=RonsNotes,
DC=Training, DC=Local"
New-ADOrganizationalUnit -Name SP_Members -Path "OU=RN_Users, DC=RonsNotes,
DC=Training, DC=Local"
New-ADOrganizationalUnit -Name SP_Visitors -Path "OU=RN_Users, DC=RonsNotes,
DC=Training, DC=Local"
New-ADOrganizationalUnit -Name SP_Designers -Path "OU=RN_Users, DC=RonsNotes,
DC=Training, DC=Local"
New-ADOrganizationalUnit -Name SP_Approvers -Path "OU=RN_Users, DC=RonsNotes,
DC=Training, DC=Local"
New-ADOrganizationalUnit -Name SVC_Accounts -Path "OU=RN_Users, DC=RonsNotes,
DC=Training, DC=Local"
New-ADOrganizationalUnit -Name SQLDBA -Path "DC=RonsNotes, DC=Training, DC=Local"
}
Create-OUs
```

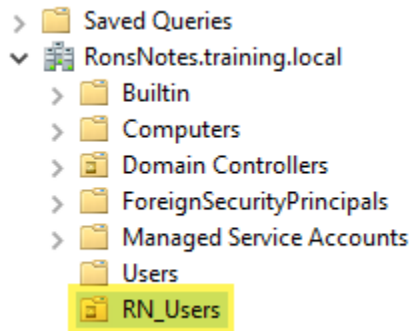
1. Navigate up to the menu in the upper-right and click **Tools | Active Directory Users and Computers**.
2. When **Active Directory Users and Computers** opens, review the options available.
3. Move to the pane on the left and expand **RonsNotes.training.local**.
4. Right-click **RonsNotes.training.local**, then click **New | Organizational Unit**.



5. In the **New Object – Organizational Unit** dialog box, move to the **Name** text box and enter **RN_Users**.

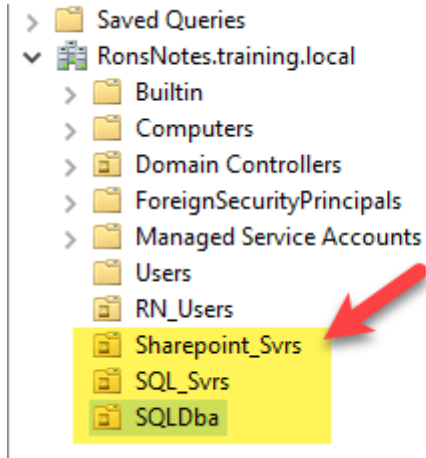


6. Review the remaining settings, then click **OK**.
7. Notice back in the pane on the left you now see **RN_Users** listed.

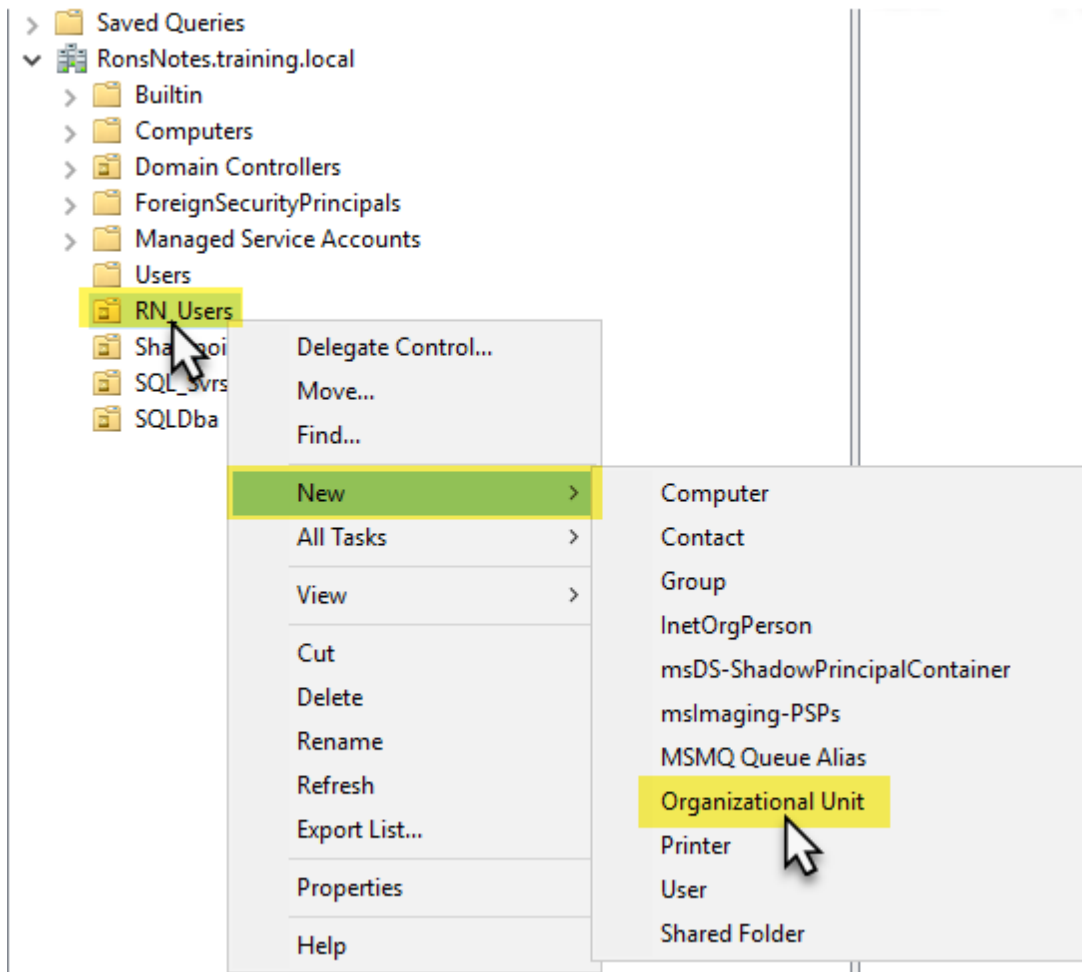


8. Repeat the last three steps to create the following additional Organizational Units:

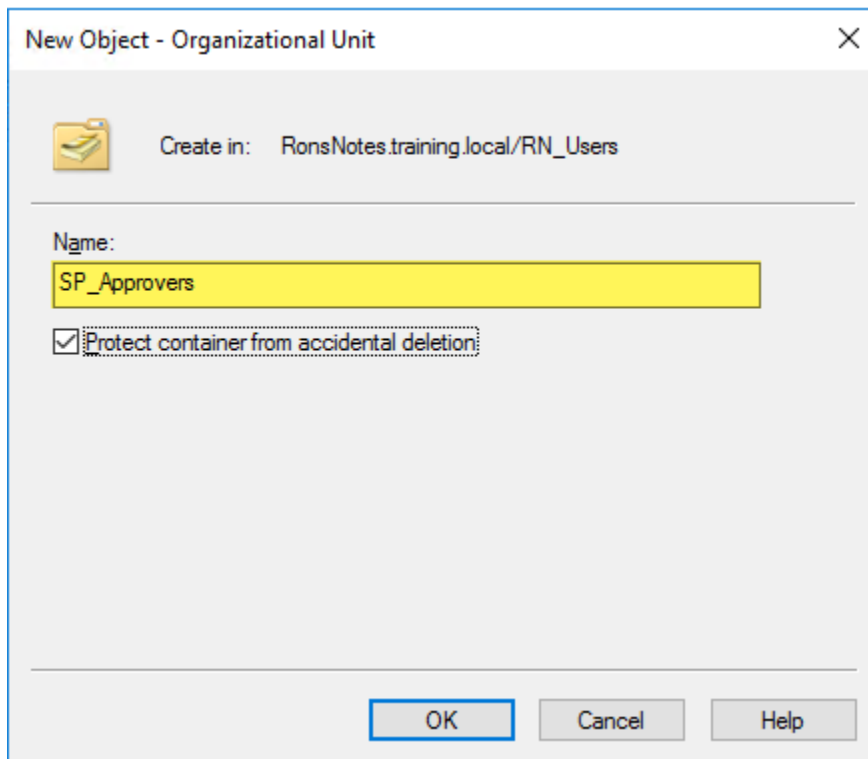
- Sharepoint_Svrs
- SQL_Svrs
- SQLDb



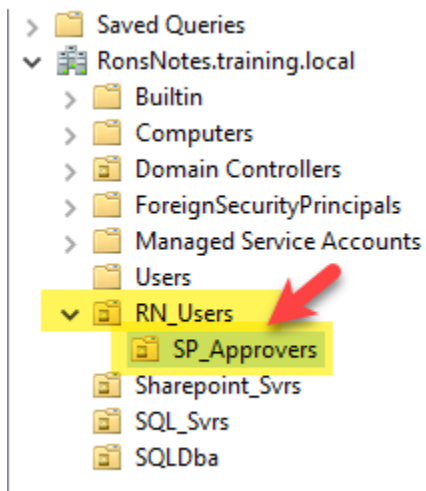
9. Click to select **RN_Users**, then right-click **RN_Users**, and click **New | Organizational Unit**.



10. In the **New Object – Organizational Unit** dialog box, move to the **Name** text box and enter **SP_Approvers**.

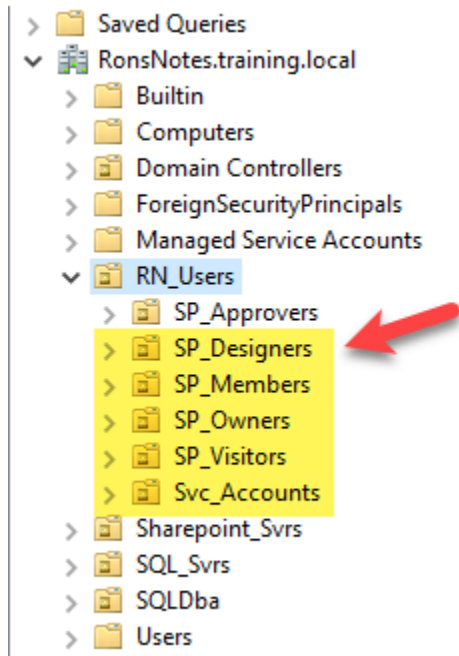


11. Review the remaining settings, then click **OK**.
12. Notice back in the pane on the left you now see **SP_Approvers** listed under **RN_Users**.



13. Repeat the last three steps to create the following additional Organizational Units within the existing **RN_Users** organizational unit:

- SP_Designers
- SP_Members
- SP_Owners
- SP_Visitors
- Svc_Accounts



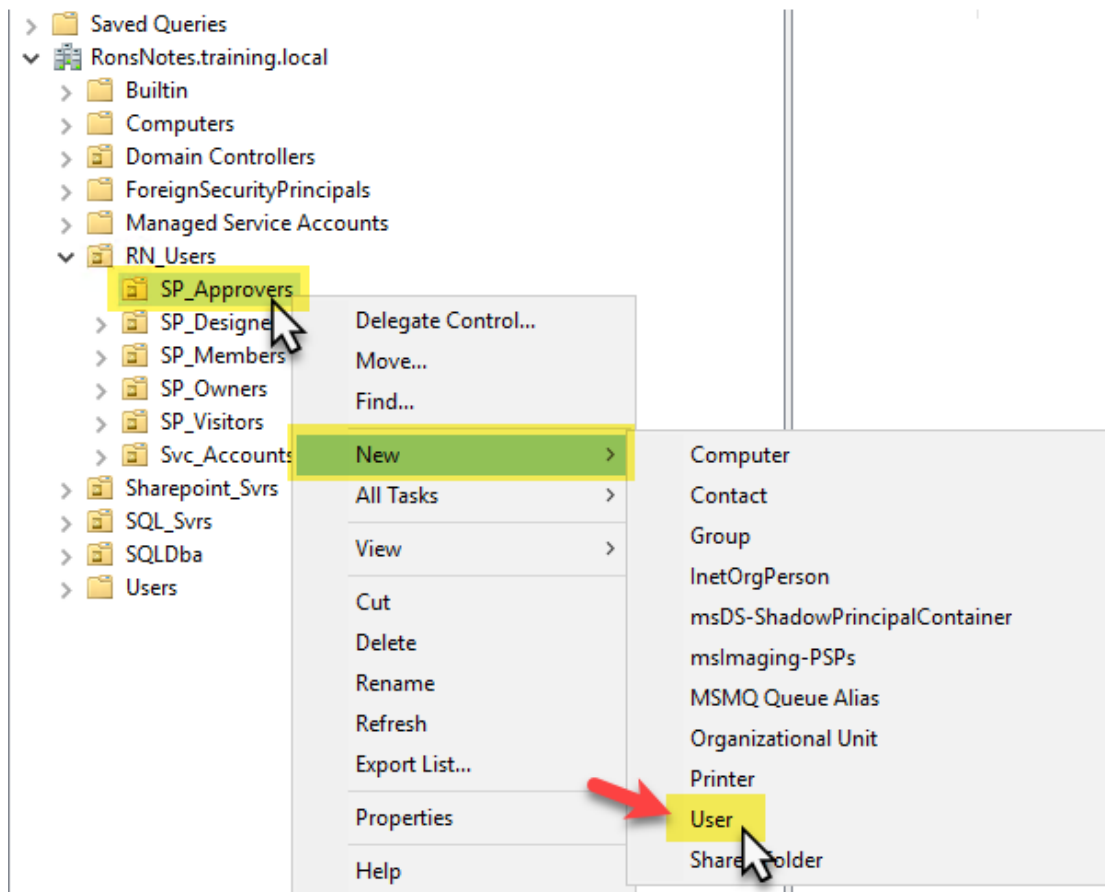
Task: Adding Active Directory Users

- If you prefer the PowerShell script instructions for this task, [click here](#).

```
#TASK: ADDING ACTIVE DIRECTORY USERS
Function Create-AdUserAccounts {
$Password = (ConvertTo-SecureString -AsPlainText "Passw0rd" -Force )
$SvcAccountOU = "OU=SVC_Accounts,OU=RN_Users,DC=RonsNotes, DC=Training, DC=Local"

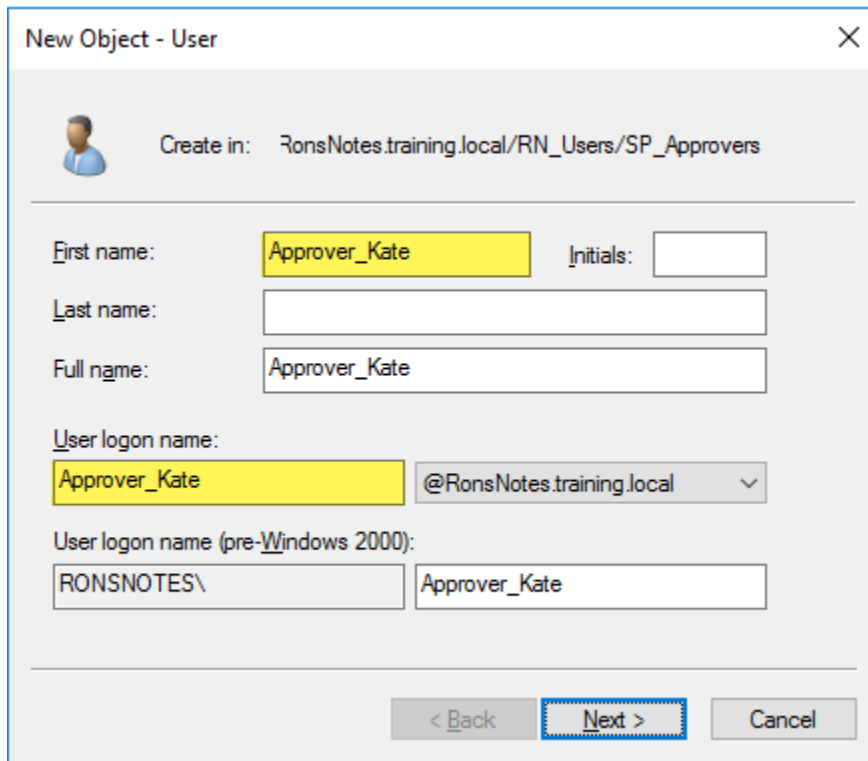
New-ADUser -Name SVC_Farm -SamAccountName SVC_Farm -AccountPassword $Password -
ChangePasswordAtLogon $false -Path $SvcAccountOU -Enabled $true
New-ADUser -Name SVC_WebSvcAccount -SamAccountName SVC_WebSvcAccount -
AccountPassword $Password -ChangePasswordAtLogon $false -Path $SvcAccountOU -
Enabled $true
New-ADUser -Name SVC_App -SamAccountName SVC_App -AccountPassword $Password -
ChangePasswordAtLogon $false -Path $SvcAccountOU -Enabled $true
New-ADUser -Name SVC_Profile -SamAccountName SVC_Profile -AccountPassword
$Password -ChangePasswordAtLogon $false -Path $SvcAccountOU -Enabled $true
New-ADUser -Name SVC_Search -SamAccountName SVC_Search -AccountPassword $Password
-ChangePasswordAtLogon $false -Path $SvcAccountOU -Enabled $true
New-ADUser -Name SVC_Installation -SamAccountName SVC_Installation -
AccountPassword $Password -ChangePasswordAtLogon $false -Path $SvcAccountOU -
Enabled $true
New-ADUser -Name SVC_Sync -SamAccountName SVC_Sync -AccountPassword $Password -
ChangePasswordAtLogon $false -Path $SvcAccountOU -Enabled $true
New-ADUser -Name SVC_Content -SamAccountName SVC_Content -AccountPassword
$Password -ChangePasswordAtLogon $false -Path $SvcAccountOU -Enabled $true
New-ADUser -Name SVC_superReader -SamAccountName SVC_superReader -AccountPassword
$Password -ChangePasswordAtLogon $false -Path $SvcAccountOU -Enabled $true
New-ADUser -Name SVC_Unattend -SamAccountName SVC_Unattend -AccountPassword
$Password -ChangePasswordAtLogon $false -Path $SvcAccountOU -Enabled $true
New-ADUser -Name SVC_DBA -SamAccountName SVC_DBA -AccountPassword $Password -
ChangePasswordAtLogon $false -Path $SvcAccountOU -Enabled $true
New-ADUser -Name Designer_Bobbie -SamAccountName Designer_Bobbie -AccountPassword
$Password -ChangePasswordAtLogon $false -Path
"OU=SP_Designers,OU=RN_Users,DC=RonsNotes, DC=Training, DC=Local" -Enabled $true
New-ADUser -Name Approver_Kate -SamAccountName Approver_Kate -AccountPassword
$Password -ChangePasswordAtLogon $false -Path
"OU=SP_Approvers,OU=RN_Users,DC=RonsNotes, DC=Training, DC=Local" -Enabled $true
New-ADUser -Name Member_Sam -SamAccountName Member_Sam -AccountPassword $Password
-ChangePasswordAtLogon $false -Path "OU=SP_Members,OU=RN_Users,DC=RonsNotes,
DC=Training, DC=Local" -Enabled $true
New-ADUser -Name Owner_Ron -SamAccountName Owner_Ron -AccountPassword $Password
-ChangePasswordAtLogon $false -Path "OU=SP_Owners,OU=RN_Users,DC=RonsNotes,
DC=Training, DC=Local" -Enabled $true
New-ADUser -Name Visitor_Carlos -SamAccountName Visitor_Carlos -AccountPassword
$Password -ChangePasswordAtLogon $false -Path
"OU=SP_Visitors,OU=RN_Users,DC=RonsNotes, DC=Training, DC=Local" -Enabled $true
New-ADUser -Name SQLDbA -SamAccountName SQLDbA -AccountPassword $Password -
ChangePasswordAtLogon $false -Path "OU=SQLDbA,DC=RonsNotes, DC=Training,
DC=Local" -Enabled $true
}
Create-AdUserAccounts
```


1. Click to select **SP_Approvers**, then right-click **SP_Approvers**, and click **New | User**.



2. In the **New Object – User** dialog box, move to the **First name** text box and enter Approver_Kate.

3. Navigate to the **User logon name** text box and enter **Approver_Kate**.



New Object - User

Create in: RonsNotes.training.local/RN_Users/SP_Approvers

First name: Approver_Kate Initials:

Last name:

Full name: Approver_Kate

User logon name: Approver_Kate @RonsNotes.training.local

User logon name (pre-Windows 2000): RONSNOTES\ Approver_Kate

< Back Next > Cancel

4. Click **Next**.
5. Move to the **Password** text box and enter **Passw0rd**. (*The 0 is numeric.*)
6. Move to the **Confirm password** text box and enter **Passw0rd**. (*The 0 is numeric.*)

7. Clear the check from the **User must change password at next logon**.
8. Verify there is a check in the **Password never expires** check box.

New Object - User

Create in: RonsNotes.training.local/RN_Users/SP_Approvers

Password: [masked]

Confirm password: [masked]

☐ User must change password at next logon

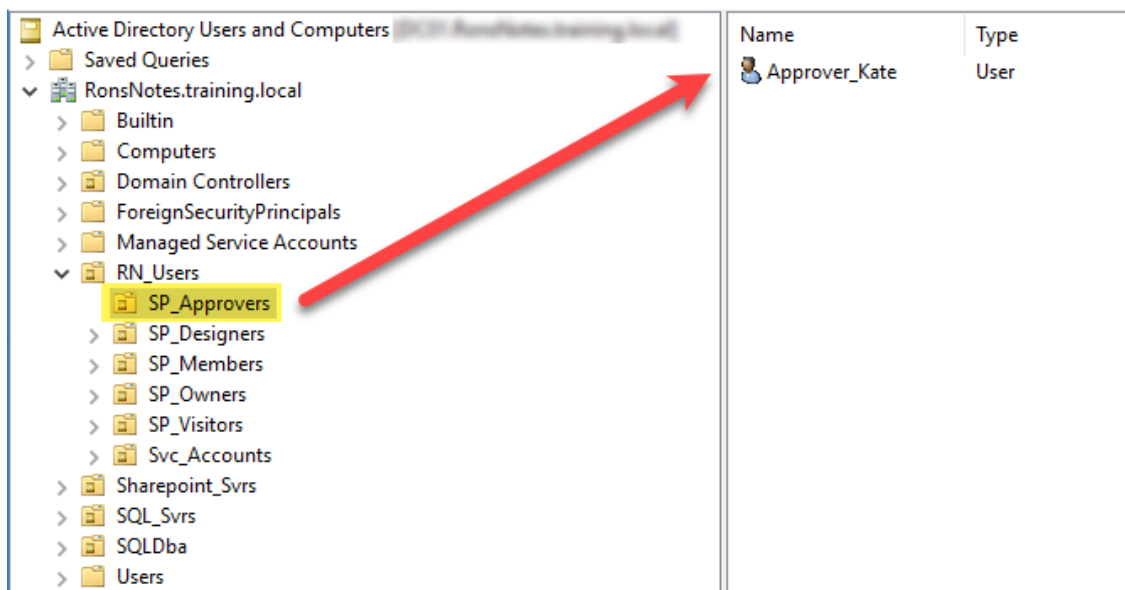
☐ User cannot change password

☒ Password never expires

☐ Account is disabled

< Back Next > Cancel

9. Click **Next**.
10. Click **Finish** and notice that **Approver_Kate** is now listed in the center section.



11. Repeat the prior ten steps to create the following users in the corresponding places.

Location	Name
RN_Users / SP_Approvers	Approver_Kate (COMPLETED ABOVE)
RN_Users SP_Designers	Designer_Bobbie
RN_Users SP_Members	Member_Sam

RN_Users SP_Owners	Owner_Ron
RN_Users SP_Visitors	Visitor_Carlos
RN_Users Svc_Accounts	SVC_Farm
RN_Users Svc_Accounts	SVC_WebSvcAccount
RN_Users Svc_Accounts	SVC_App
RN_Users Svc_Accounts	SVC_Profile
RN_Users Svc_Accounts	SVC_Search
RN_Users Svc_Accounts	SVC_Installation
RN_Users Svc_Accounts	SVC_Sync
RN_Users Svc_Accounts	SVC_Content
RN_Users Svc_Accounts	SVC_superReader
RN_Users Svc_Accounts	SVC_Unattend
RN_Users Svc_Accounts	SVC_DBA
SQLDb	SQLDb

12. Close **Active Directory Users and Computers**.

13. Minimize **Humongous**.

PHASE 04 SETUP SQL SERVER

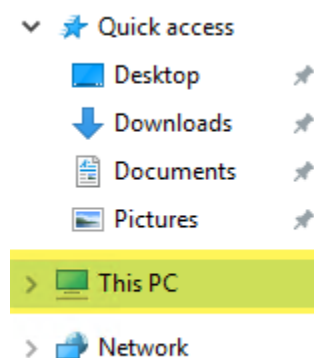
Phase Objective

In this phase, we will set up SQL Server on the virtual machine. Phase Topics

- Install SQL Server 2016
- Install SQL Server Management Studio

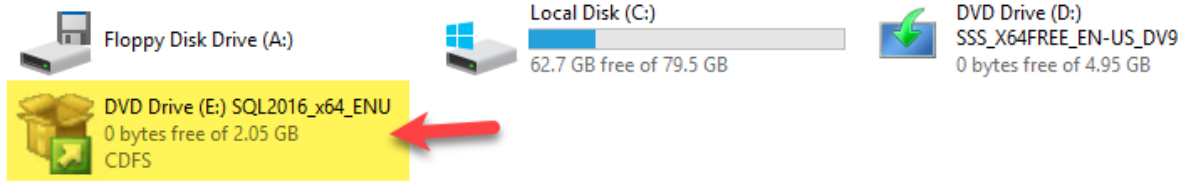
Task Install SQL Server 2016

1. In **Hyper-V Manager**, click to select **Humongous**, then right-click the virtual machine and select **Start**. (If it isn't already started.)
2. Double-click the **Humongous** virtual machine, then click **Connect**.
3. At the logon screen, click **Other user** in the lower-left corner, then log in as **Student**.
4. Start **File Explorer**.
5. Navigate to the pane on the left and click to select **This PC**.



6. Double-click **E:** drive.

✓ Devices and drives (4)

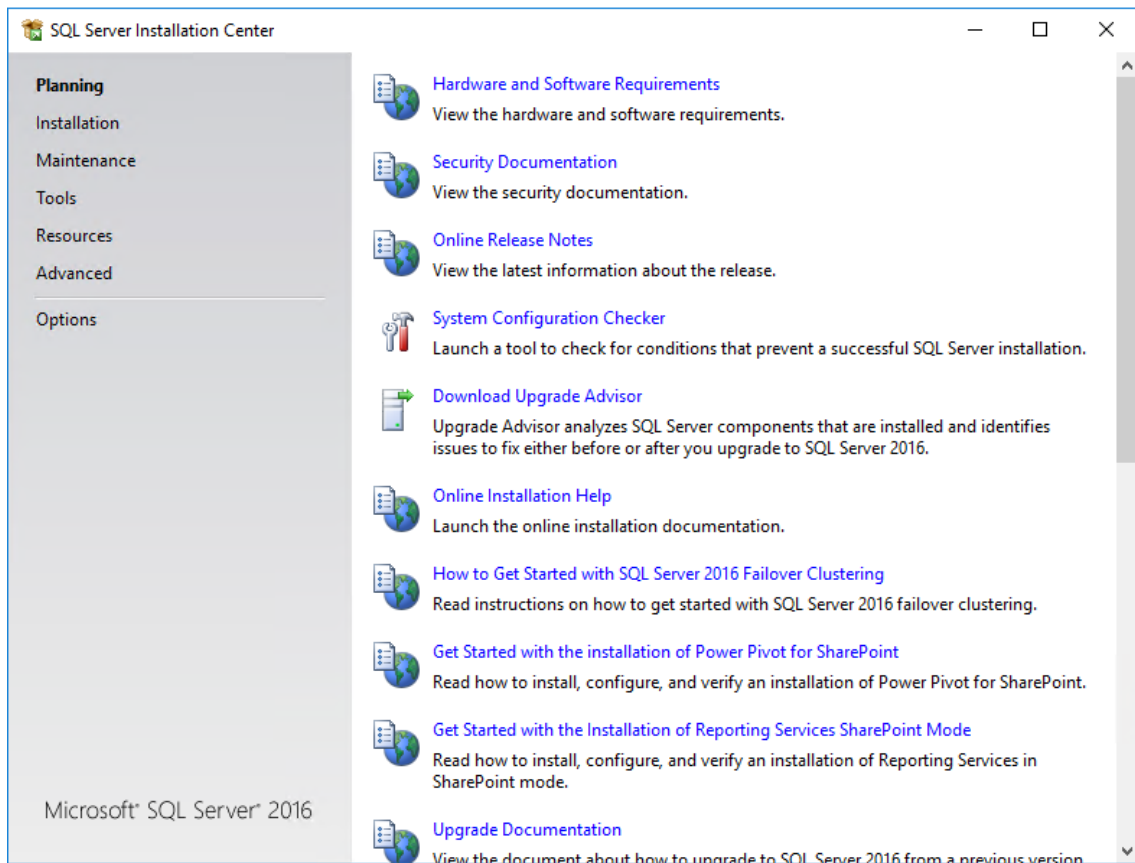


7. When the list of files appears, locate and double-click **Setup.exe**.

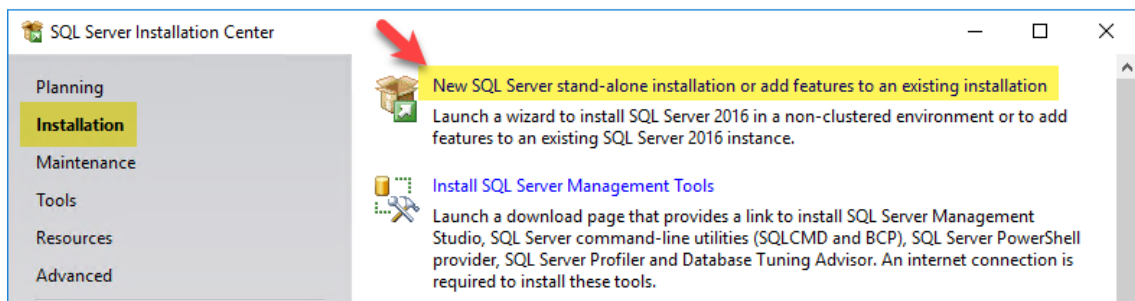
Name	Date modified	Type
1033_ENU_LP	5/3/2016 4:05 PM	File folder
redist	5/3/2016 4:10 PM	File folder
resources	5/3/2016 4:10 PM	File folder
Tools	5/3/2016 4:10 PM	File folder
x64	5/3/2016 4:10 PM	File folder
autorun	2/9/2016 7:38 PM	Setup Information
MedialInfo	4/30/2016 9:13 PM	XML Document
setup	4/30/2016 9:12 AM	Application
setup.exe.config	2/9/2016 7:34 PM	CONFIG File
SqlSetupBootstrapper.dll	4/30/2016 9:12 AM	Application extens...
sqmapi.dll	4/30/2016 9:12 AM	Application extens...

8. In the **User Account Control** dialog box, click **Yes**.

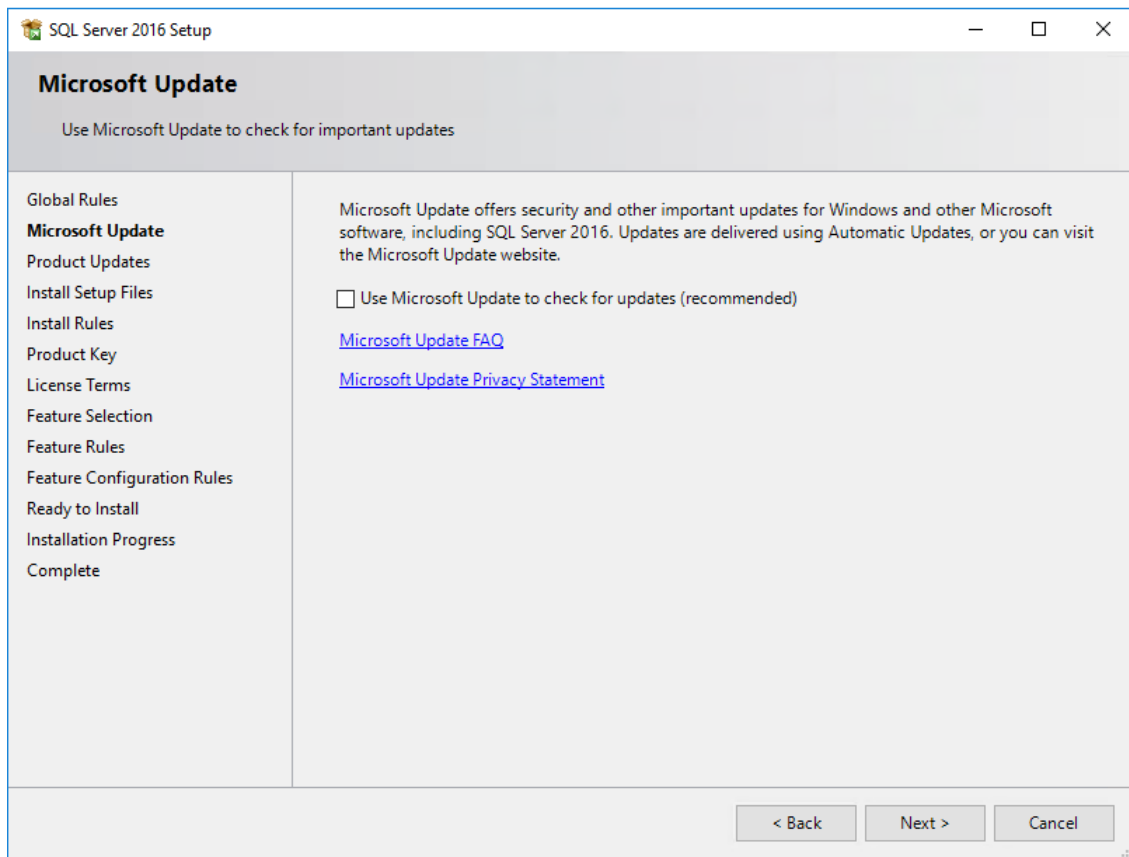
9. In the **SQL Server Installation Center** dialog box, review the options available.



10. Navigate to the pane on the left and click **Installation**.
11. Click the link for a **New SQL Server stand-alone installation or add features to an existing installation**.



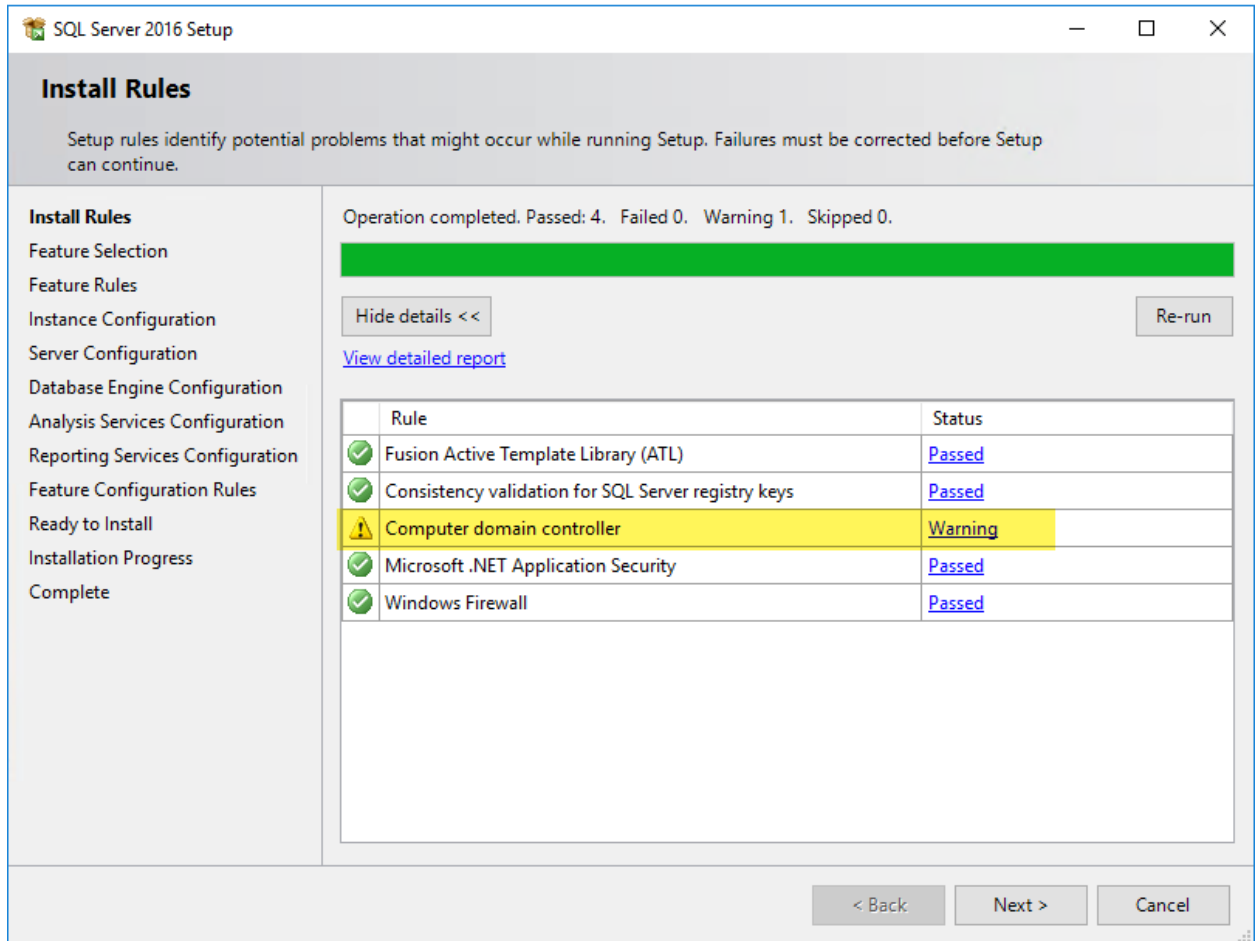
12. In the **Microsoft Update** dialog box, click **Next**.





If you encounter a Product Updates dialog box, click Next.

13. When the **Install Rules** dialog box opens, ignore the **Computer domain controller Warning**, then click **Next**.



14. In the **Product Key** dialog box, verify **Evaluation** is selected, then click **Next**.

The screenshot shows the 'SQL Server 2016 Setup' window with the 'Product Key' tab selected. The left sidebar lists various setup steps, with 'Product Key' highlighted. The main area contains instructions on how to validate the installation and two options: 'Specify a free edition' (selected) and 'Enter the product key'. The 'Specify a free edition' option has a dropdown menu with 'Evaluation' selected. The 'Enter the product key' option has an empty text field with a placeholder for a 25-character key. At the bottom right, there are buttons for '< Back', 'Next >', and 'Cancel'.

SQL Server 2016 Setup

Product Key

Specify the edition of SQL Server 2016 to install.

Global Rules
Microsoft Update
Product Updates
Install Setup Files
Install Rules
Product Key
License Terms
Feature Selection
Feature Rules
Feature Configuration Rules
Ready to Install
Installation Progress
Complete

Validate this instance of SQL Server 2016 by entering the 25-character key from the Microsoft certificate of authenticity or product packaging. You can also specify a free edition of SQL Server: Developer, Evaluation, or Express. Evaluation has the largest set of SQL Server features, as documented in SQL Server Books Online, and is activated with a 180-day expiration. Developer edition does not have an expiration, has the same set of features found in Evaluation, but is licensed for non-production database application development only. To upgrade from one installed edition to another, run the Edition Upgrade Wizard.

☒ Specify a free edition:

Evaluation

☐ Enter the product key:

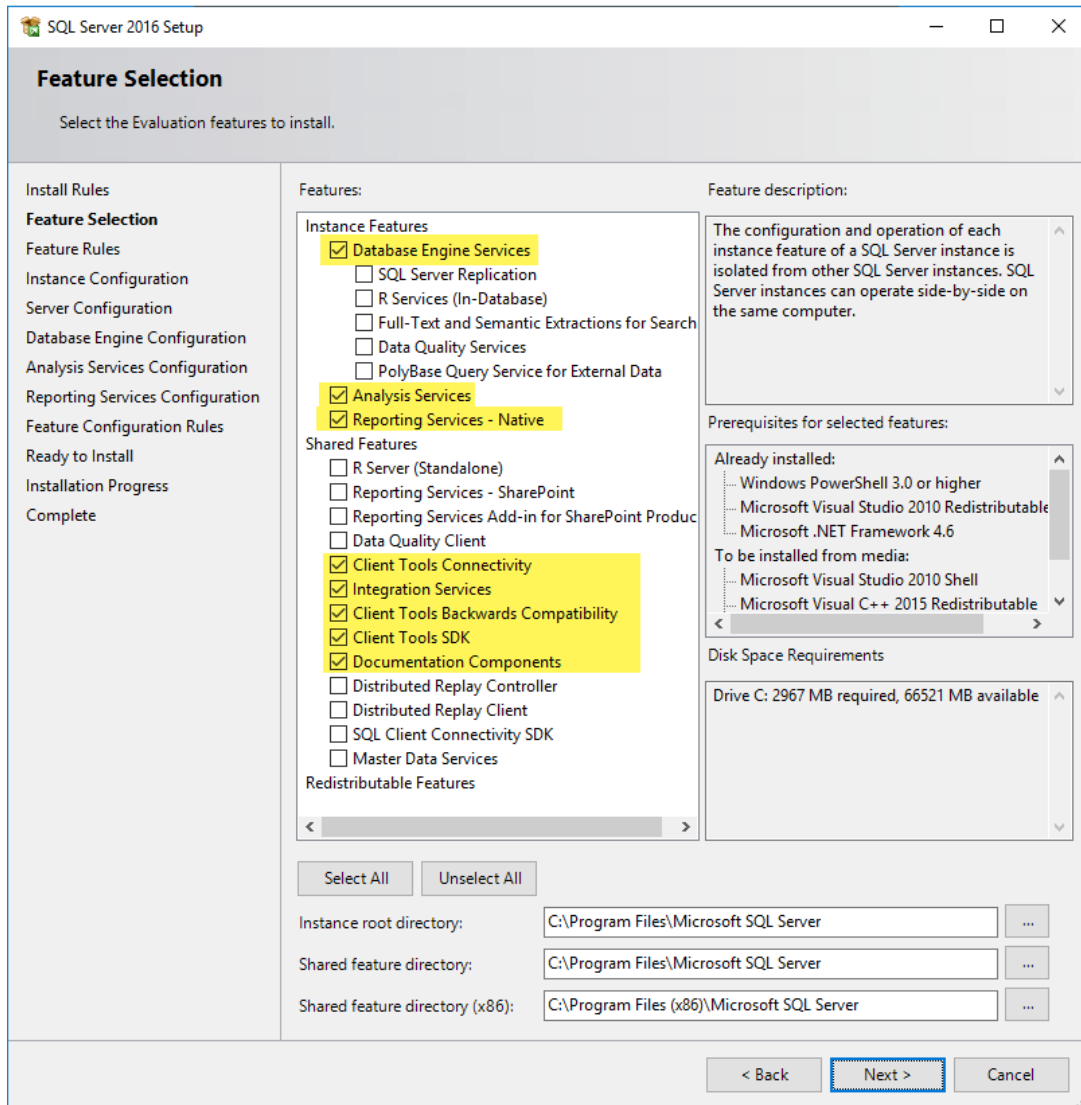
_____ - _____ - _____ - _____ - _____

< Back Next > Cancel

15. In the **License Terms** dialog box, place a check in the **I accept the license terms** check box and click **Next**.

16. In the **Feature Selection** dialog box, place a check in the following check boxes:

- Database Engine Services
- Analysis Services
- Reporting Services – Native
- Client Tools Connectivity
- Integration Services
- Client Tools Backwards Compatibility
- Client Tools SDK
- Documentation Components



17. Click **Next**.
18. In the **Instance Configuration** dialog box, leave the **Default instance** settings as they are, and click **Next**.

☒ **Default instance**
☐ **Named instance:**

Instance ID:

SQL Server directory:

Analysis Services directory:

Reporting Services directory:

19. In the **Server Configuration** dialog box, move to the **SQL Server Analysis Services** row, click into the empty **Account Name** text box, use the corresponding drop-down arrow, then click <<**Browse...**>>.
20. In the **Select Users, Computers, Service Accounts, or Groups** dialog box, move to the **Enter the object names to select** text box and enter SQLDbA.

21. Click **Check Names** and notice SQLDbA is now underlined.
22. Click **OK**.
23. Click into the corresponding empty **Password** text box and enter Passw0rd.



In Passw0rd, the 0 is numeric.

Service	Account Name	Password	Startup Type
SQL Server Agent	NT Service\SQLSERVERA...		Manual
SQL Server Database Engine	NT Service\MSSQLSERVER		Automatic
SQL Server Analysis Services	RonsNotes\SQLDbA	Automatic
SQL Server Reporting Services	NT Service\ReportServer		Automatic
SQL Server Integration Services 13.0	NT Service\MsDtsServer...		Automatic
SQL Server Browser	NT AUTHORITY\LOCAL ...		Disabled

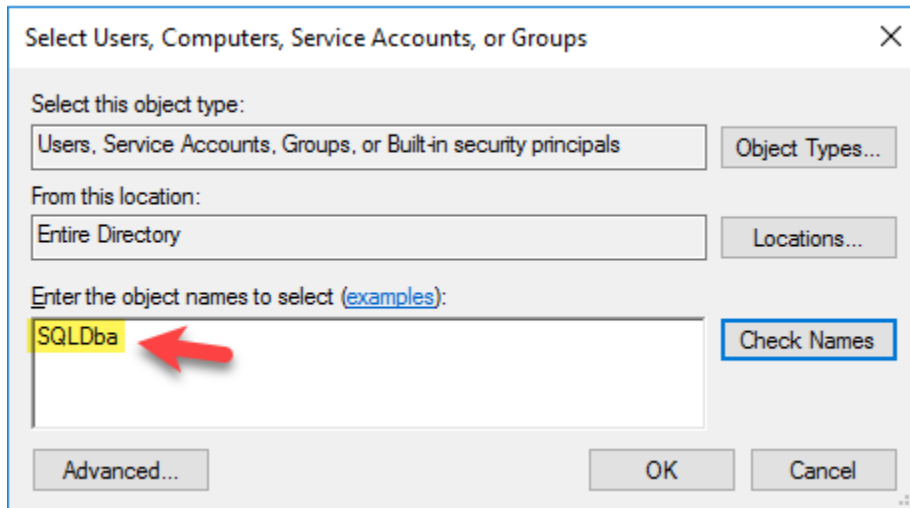
☐ Grant Perform Volume Maintenance Task privilege to SQL Server Database Engine Service

This privilege enables instant file initialization by avoiding zeroing of data pages. This may lead to information disclosure by allowing deleted content to be accessed.

[Click here for details](#)

24. Click **Next**.
25. In the **Database Engine Configuration** dialog box, review the current settings.
26. Click **Add Current User**.
27. Notice you now see **RONSNOTES\Student (Student)** listed in the **Specify SQL Server administrators** text box.

28. Click **Add...**
29. In the **Select Users, Computers, Service Accounts, or Groups** dialog box, move to the **Enter the object names to select** text box and enter SQLDbA.

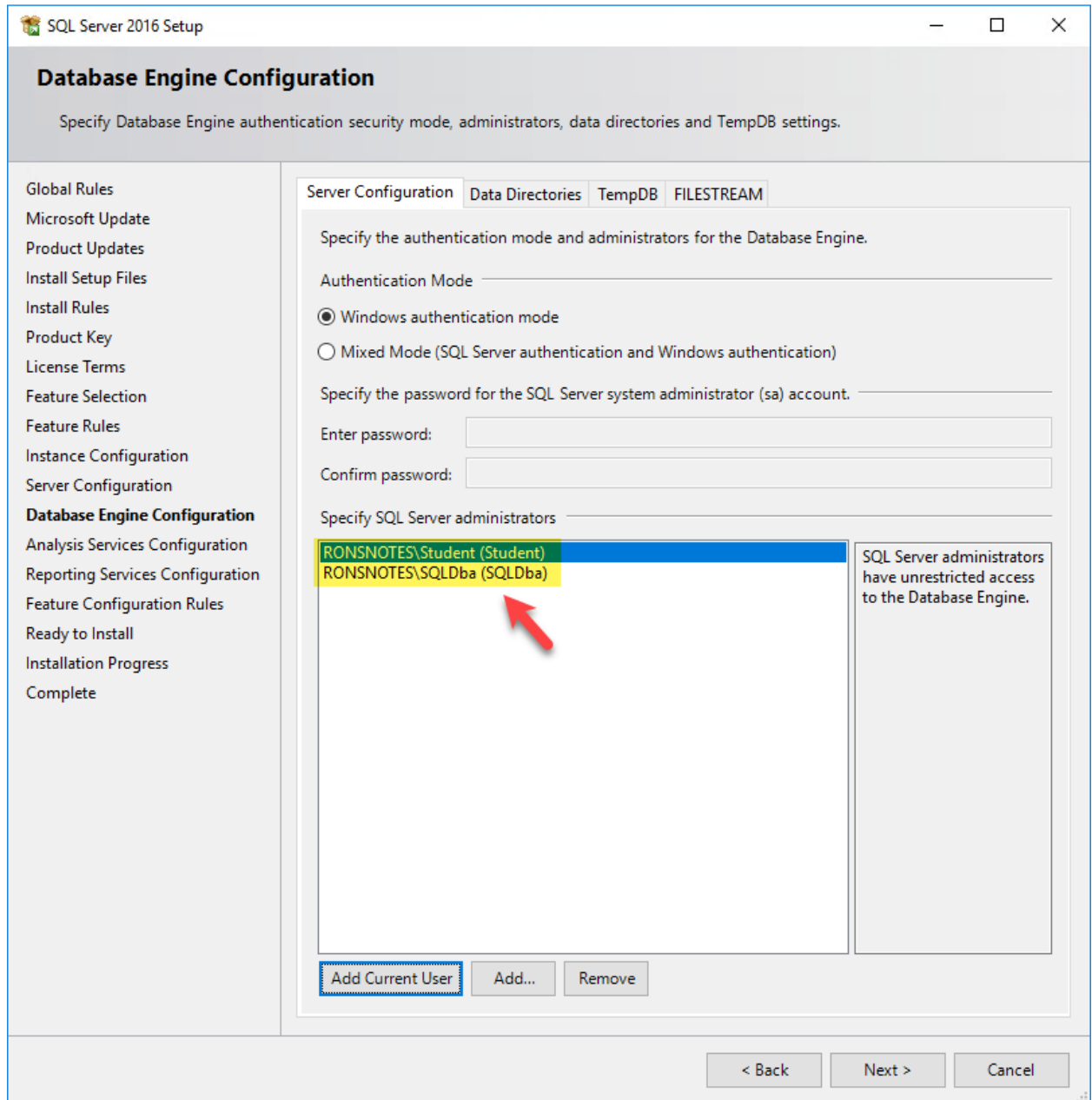


30. Click **Check Names** and notice SQLDbA is now underlined.
31. Click **OK**.

32. Notice you now see **RONSNOTES\SQLDbA (SQLDbA)** listed in the **Specify SQL Server administrators** text box.

At this point you should show two administrators:

- *RONSNOTES\Student (Student)*
- *RONSNOTES\SQLDbA (SQLDbA)*



33. Click **Next**.

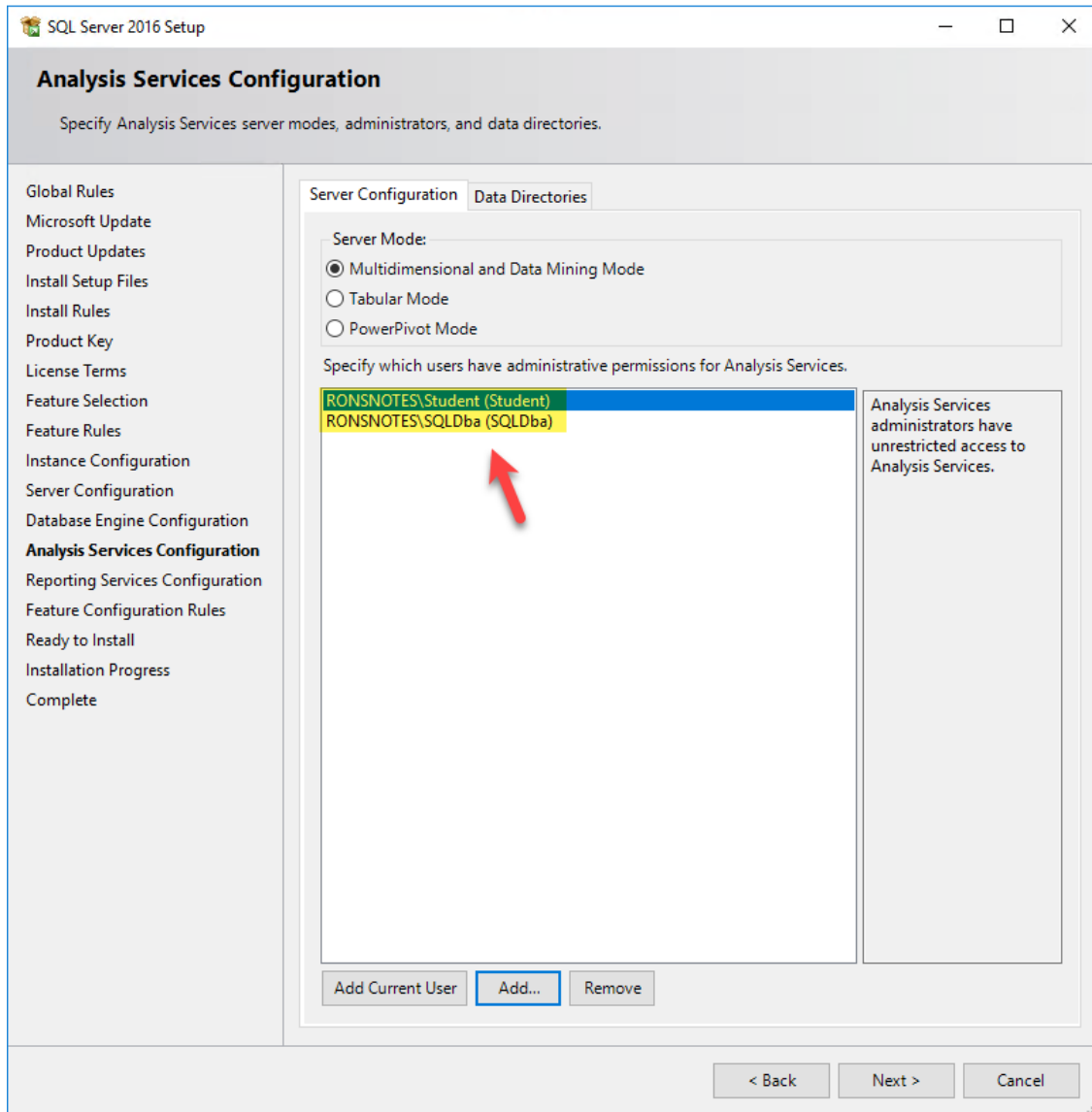
34. In the **Analysis Service Configuration** dialog box, review the current settings.

35. Click **Add Current User**.

36. Notice you now see **RONSNOTES\Student (Student)** listed in the **Specify which users have administrative permissions for Analysis Services** text box.

37. Click **Add...**.

38. In the **Select Users, Computers, Service Accounts, or Groups** dialog box, move to the **Enter the object names to select** text box and enter **SQLDb**.
39. Click **Check Names** and notice **SQLDb** is now underlined.
40. Click **OK**.
41. Notice you now see **RONSNOTES\SQLDb (SQLDb)** listed in the **Specify which users have administrative permissions for Analysis Services** text box.
At this point you should show two administrators:
 - *RONSNOTES\Student (Student)*
 - *RONSNOTES\SQLDb (SQLDb)*



42. Click **Next**.

43. In the **Reporting Services Configuration** dialog box, review the settings, then click **Next**.

Reporting Services Native Mode

☒ Install and configure.
Installs and configures the report server in native mode. The report server is operational after setup completes.

☐ Install only.
Installs the report server files. After installation, use Reporting Services Configuration Manager to configure the report server for native mode.

Reporting Services SharePoint Integrated Mode

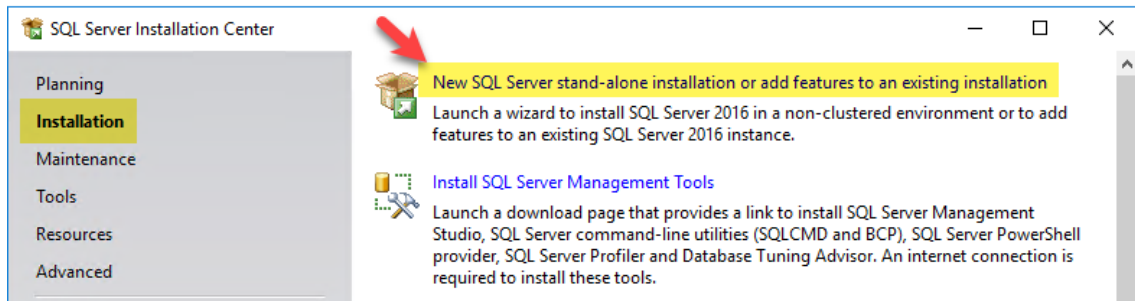
☐ Install only.
Installs the report server files. After installation use SharePoint Central Administration to complete the configuration. Verify the SQL Server Reporting Services service is started and create at least one SQL Server Reporting Services service application. For more information, click Help.

44. Click **Next**.
45. In the **Ready to Install** dialog box, click **Install**.
46. Upon **Success**, click **Close**.
47. Using **Hyper-V Manager**, shut down and restart the VM.
48. Double-click the VM to connect.
49. Open **File Explorer** and double-click the drive containing **SQL2016_x64_ENU**.
50. Double-click **setup**.

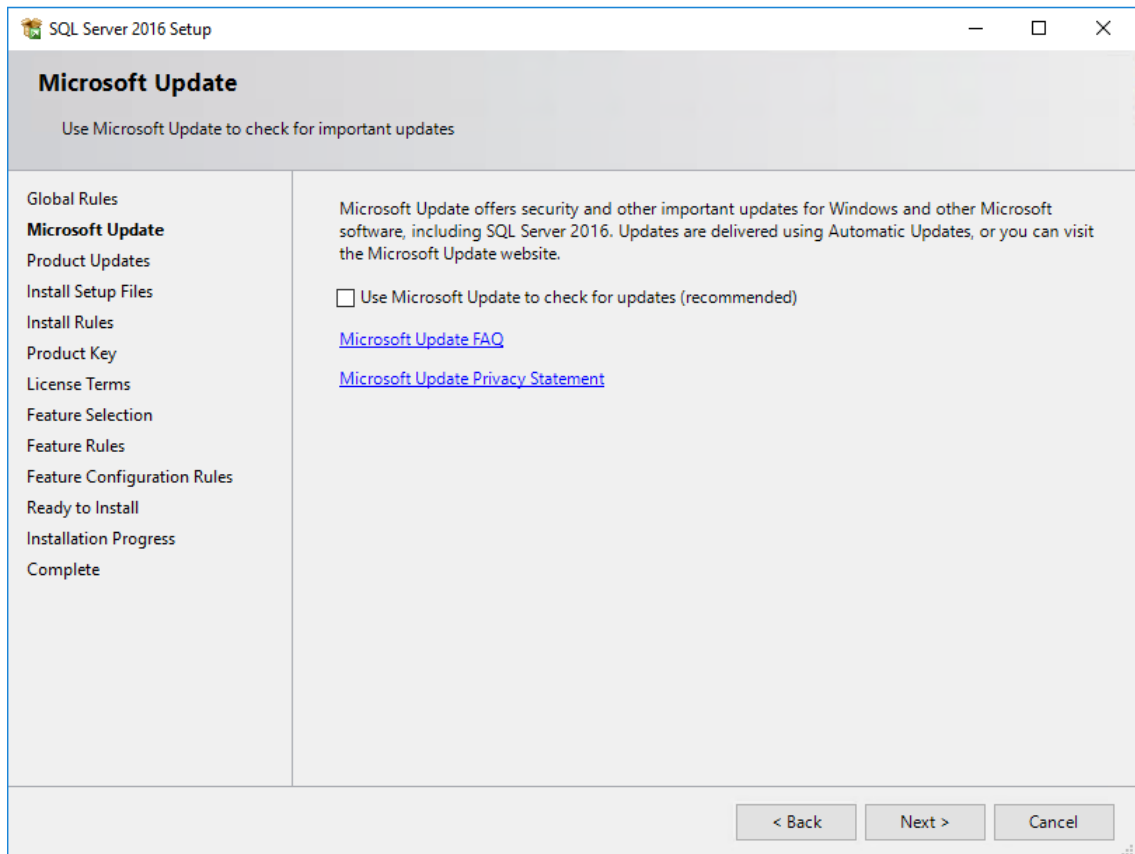
Name	Date modified	Type
1033_ENU_LP	5/3/2016 4:05 PM	File folder
redist	5/3/2016 4:10 PM	File folder
resources	5/3/2016 4:10 PM	File folder
Tools	5/3/2016 4:10 PM	File folder
x64	5/3/2016 4:10 PM	File folder
autorun	2/9/2016 7:38 PM	Setup Information
MediaInfo	4/30/2016 9:13 PM	XML Document
setup	4/30/2016 9:12 AM	Application
setup.exe.config	2/9/2016 7:34 PM	CONFIG File
SqlSetupBootstrapper.dll	4/30/2016 9:12 AM	Application extens...
sqmapi.dll	4/30/2016 9:12 AM	Application extens...

51. In the **User Account Control** dialog box, click **Yes**.
52. In **SQL Server Installation Center**, click **Installation** tab.

53. Click the link for a **New SQL Server stand-alone installation or add features to an existing installation**.



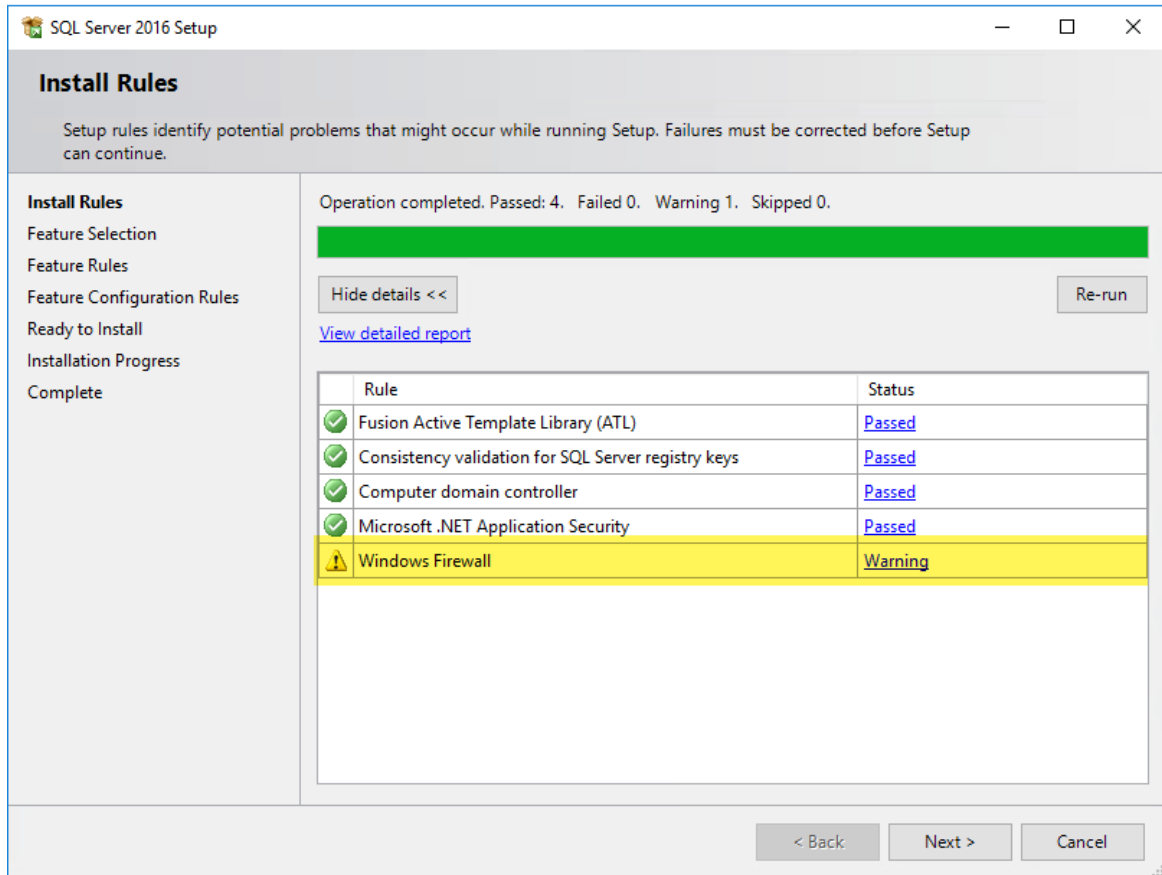
54. In the **Microsoft Update** dialog box, click **Next**.





If you encounter a Product Updates dialog box, click Next.

55. When the **Install Rules** dialog box opens, ignore the **Windows Firewall Warning**, then click **Next**.



56. In the **Installation Type** dialog box, click **Next**.

Installation Type

Perform a new installation or add features to an existing instance of SQL Server 2016.

☒ Perform a new installation of SQL Server 2016
Select this option if you want to install a new instance of SQL Server or want to install shared components.

☐ Add features to an existing instance of SQL Server 2016
MSSQLSERVER
Select this option if you want to add features to an existing instance of SQL Server. For example, you want to add the Analysis Services features to the instance that contains the Database Engine. Features within an instance must be the same edition.

Installed instances:

Instance Name	Instance ID	Features	Edition	Version
MSSQLSERVER	MSSQL13.MSSQLS...	SQLEngine,AS,RS	Evaluation	13.0.1601.5
<Shared Compone...		Conn, BC, SDK		13.0.14500.10
<Shared Compone...		IS		13.0.1601.5

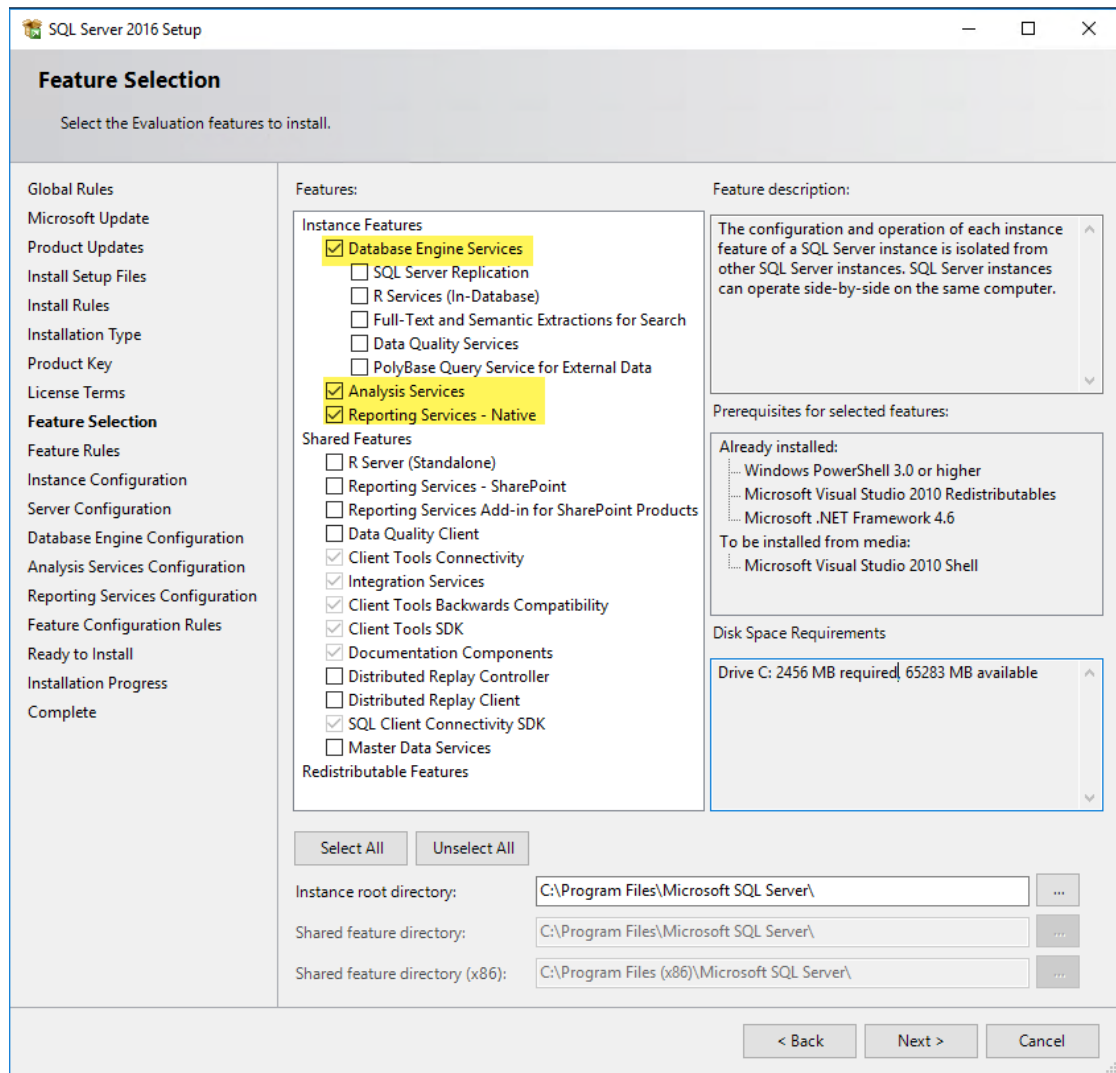
< Back Next > Cancel

57. In the **Product Key** dialog box, click **Next**.

58. In the **License Terms** dialog box, place a check in the **I accept the license terms** check box and click **Next**.

59. In the **Feature Selection** dialog box, place a check in the following check boxes:

- Database Engine Services
- Analysis Services
- Reporting Services – Native



60. Click **Next**.

61. In the **Instance Configuration** dialog box, move to the **Named instance** text box and enter **INSTANCE2**.

62. In the **Instance ID** text box, enter **INSTANCE2** and then click **Next**.

☐ Default instance
☒ Named instance:

Instance ID:

SQL Server directory: C:\Program Files\Microsoft SQL Server\MSSQL13.INSTANCE2
Analysis Services directory: C:\Program Files\Microsoft SQL Server\MSAS13.INSTANCE2
Reporting Services directory: C:\Program Files\Microsoft SQL Server\MSRS13.INSTANCE2

63. In the **Server Configuration** dialog box, click **Next**.
64. In the **Select Users, Computers, Service Accounts, or Groups** dialog box, move to the **Enter the object names to select** text box and enter **SQLDb**.

Select Users, Computers, Service Accounts, or Groups

Select this object type:

From this location:

Enter the object names to select (examples):

65. Click **Check Names** and notice SQLDb is now underlined.
66. Click **OK**.

67. Click into the corresponding empty **Password** text box and enter **Passw0rd**.



In Passw0rd, the 0 is numeric.

Service	Account Name	Password	Startup Type
SQL Server Agent	NT Service\SQLSERVERA...		Manual
SQL Server Database Engine	NT Service\MSSQLSERVER		Automatic
SQL Server Analysis Services	RonsNotes\SQLDb	••••••••	Automatic
SQL Server Reporting Services	NT Service\ReportServer		Automatic
SQL Server Integration Services 13.0	NT Service\MsDtsServer...		Automatic
SQL Server Browser	NT AUTHORITY\LOCAL ...		Disabled

☐ Grant Perform Volume Maintenance Task privilege to SQL Server Database Engine Service

This privilege enables instant file initialization by avoiding zeroing of data pages. This may lead to information disclosure by allowing deleted content to be accessed.

[Click here for details](#)

68. Click **Next**.

69. In the **Database Engine Configuration** dialog box, review the current settings.

70. Click **Add Current User**.

71. Notice you now see **RONSNOTES\Student (Student)** listed in the **Specify SQL Server administrators** text box.

72. Click **Add...**

73. In the **Select Users, Computers, Service Accounts, or Groups** dialog box, move to the **Enter the object names to select** text box and enter **SQLDb**.

Select Users, Computers, Service Accounts, or Groups

Select this object type:
Users, Service Accounts, Groups, or Built-in security principals

From this location:
Entire Directory

Enter the object names to select (examples):
SQLDb

Check Names

Advanced... OK Cancel

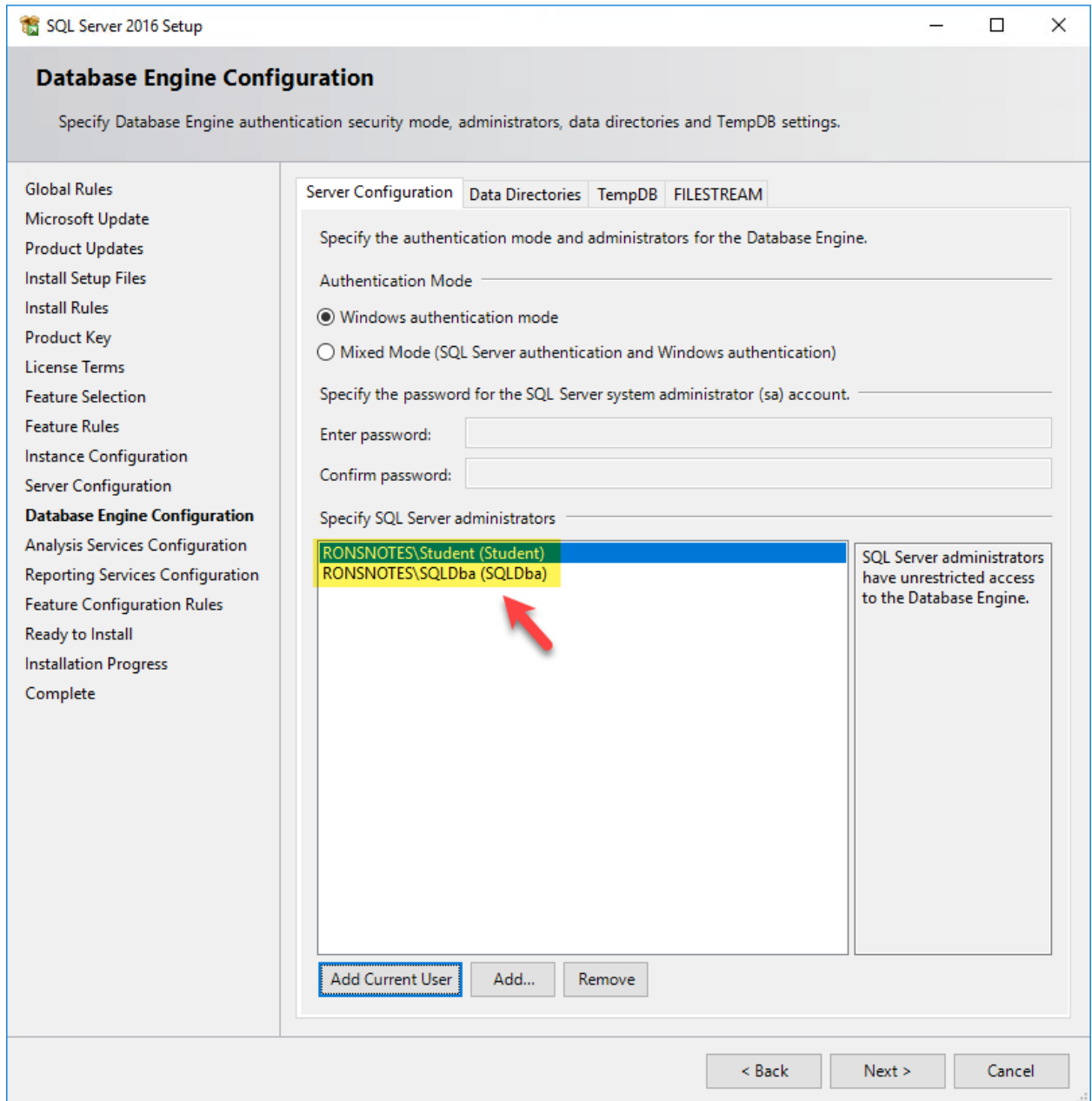
74. Click **Check Names** and notice **SQLDb** is now underlined.

75. Click **OK**.

76. Notice you now see **RONSNOTES\SQLDb (SQLDb)** listed in the **Specify SQL Server administrators** text box.

At this point you should show two administrators:

- *RONSNOTES\Student (Student)*
- *RONSNOTES\SQLDb (SQLDb)*



77. Click **Next**.

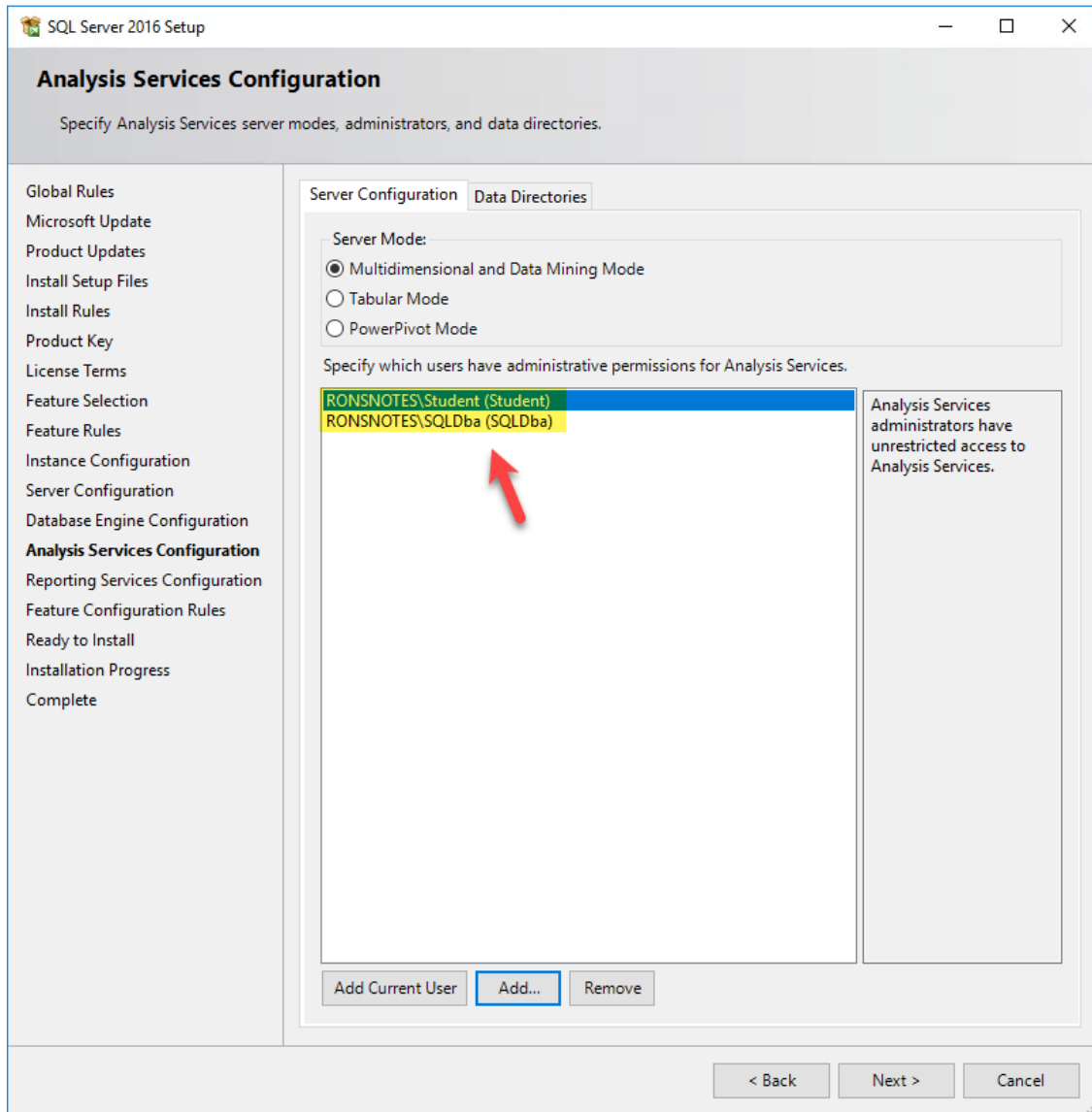
78. In the **Analysis Service Configuration** dialog box, review the current settings.

79. Click **Add Current User**.

80. Notice you now see **RONSNOTES\Student (Student)** listed in the **Specify which users have administrative permissions for Analysis Services** text box.

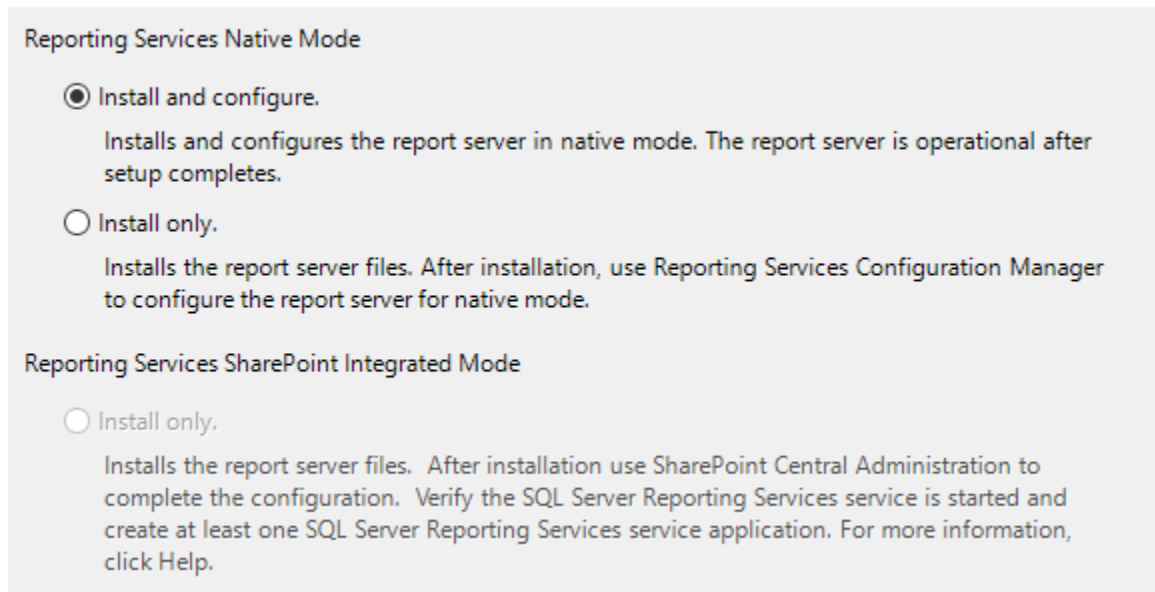
81. Click **Add...**

82. In the **Select Users, Computers, Service Accounts, or Groups** dialog box, move to the **Enter the object names to select** text box and enter **SQLDb**.
83. Click **Check Names** and notice **SQLDb** is now underlined.
84. Click **OK**.
85. Notice you now see **RONSNOTES\SQLDb (SQLDb)** listed in the **Specify which users have administrative permissions for Analysis Services** text box.
- At this point you should show two administrators:*
- *RONSNOTES\Student (Student)*
 - *RONSNOTES\SQLDb (SQLDb)*



86. Click **Next**.

87. In the **Reporting Services Configuration** dialog box, review the settings, then click **Next**.



The image shows a screenshot of the 'Reporting Services Configuration' dialog box. It has two main sections: 'Reporting Services Native Mode' and 'Reporting Services SharePoint Integrated Mode'. Under 'Native Mode', there are two radio buttons: 'Install and configure.' (which is selected) and 'Install only.'. Below each radio button is a descriptive paragraph. Under 'SharePoint Integrated Mode', there is one radio button: 'Install only.', also with a descriptive paragraph below it.

Reporting Services Native Mode

☒ **Install and configure.**
Installs and configures the report server in native mode. The report server is operational after setup completes.

☐ **Install only.**
Installs the report server files. After installation, use Reporting Services Configuration Manager to configure the report server for native mode.

Reporting Services SharePoint Integrated Mode

☐ **Install only.**
Installs the report server files. After installation use SharePoint Central Administration to complete the configuration. Verify the SQL Server Reporting Services service is started and create at least one SQL Server Reporting Services service application. For more information, click Help.

88. Click **Next**.

89. In the **Ready to Install** dialog box, click **Install**.

90. Upon **Success**, click **Close**.

91. Using **Hyper-V Manager**, shut down and restart the VM.

92. Double-click the VM to connect.

93. Open **File Explorer** and double-click the drive containing **SQL2016_x64_ENU**.

94. Double-click **setup**.

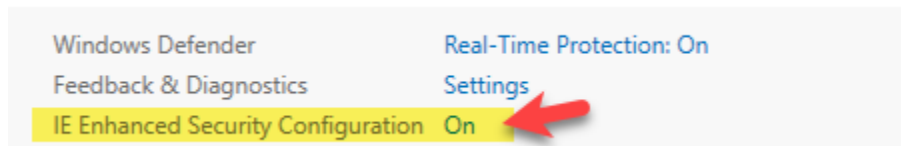
95. In the **User Account Control** dialog box, click **Yes**.

96. In **SQL Server Installation Center**, click **Installation** tab.

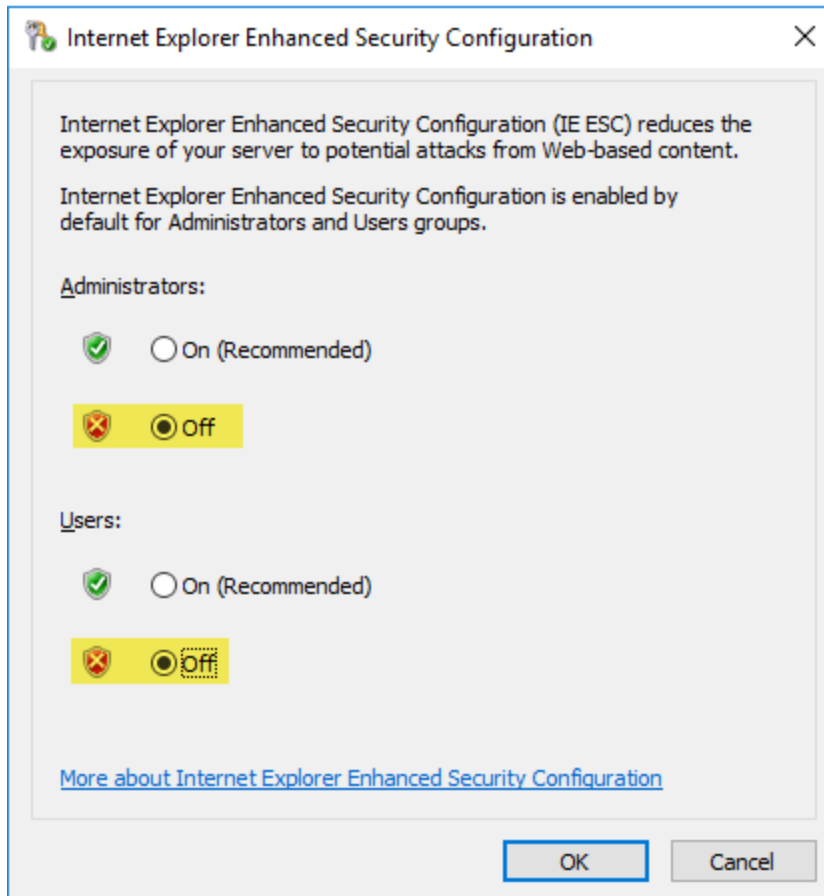
Task: Install SQL Server Management Studio

There is no PowerShell script equivalent to this task.

1. Switch to **Server Manager**.
2. Navigate to the pane on the left and click to select the **Local Server** tab.
3. Locate the **IE Enhanced Security Configuration** setting and click the corresponding **On** link.



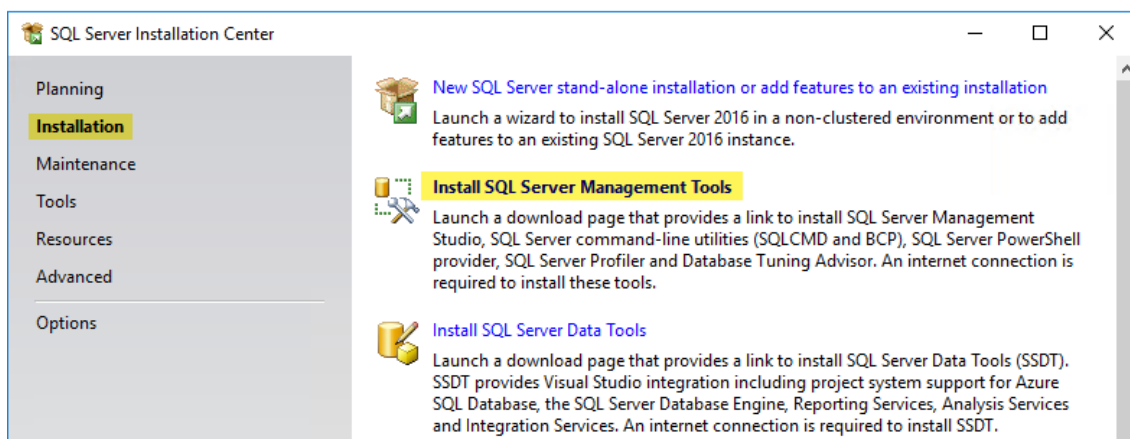
4. Click the **Off** radio button for both **Administrators** and **Users**.



5. Click **OK**.
6. Switch back to the **SQL Server Installation Center**, move to the pane on the left and click **Installation**.
7. Click **Install SQL Server Management Tools** link.

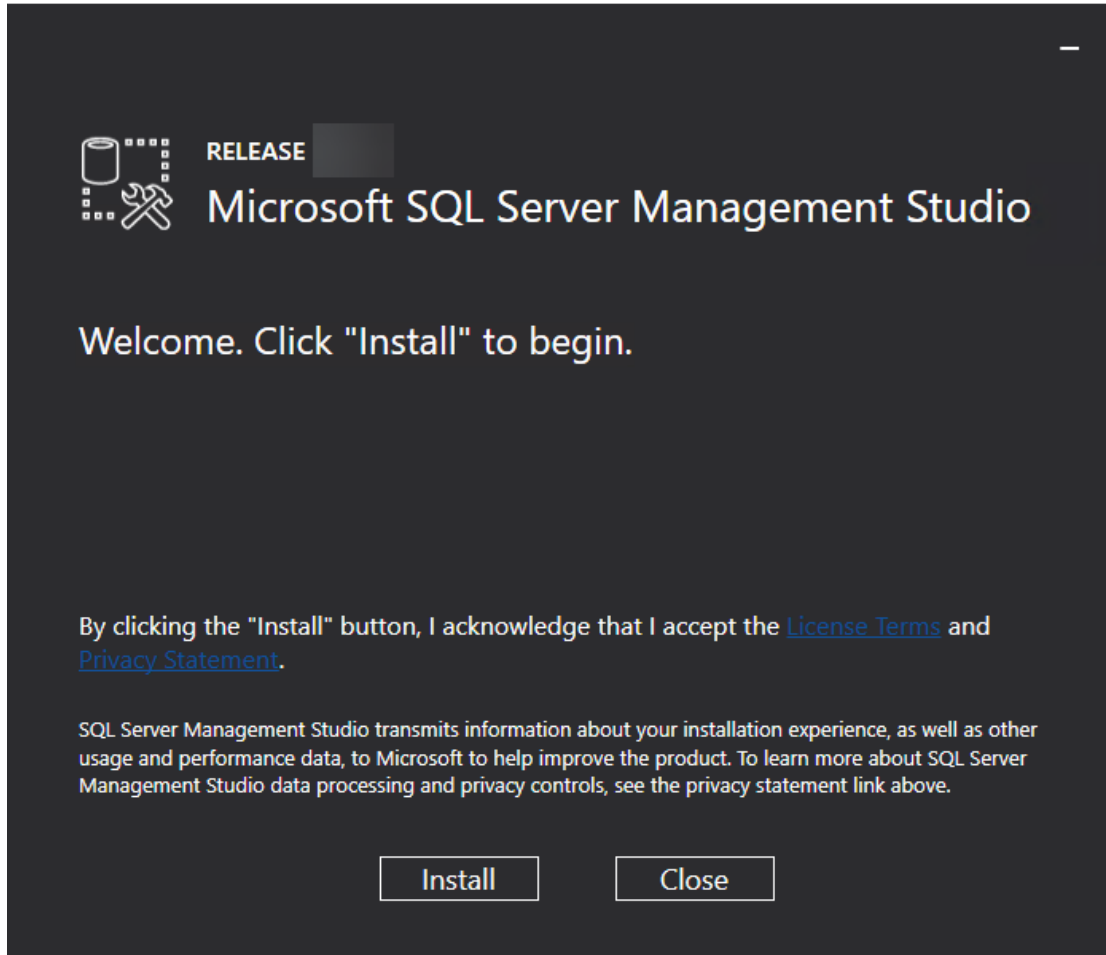


If you receive the Internet Explorer settings dialog box, move the radio button to Don't use recommended settings and click OK.

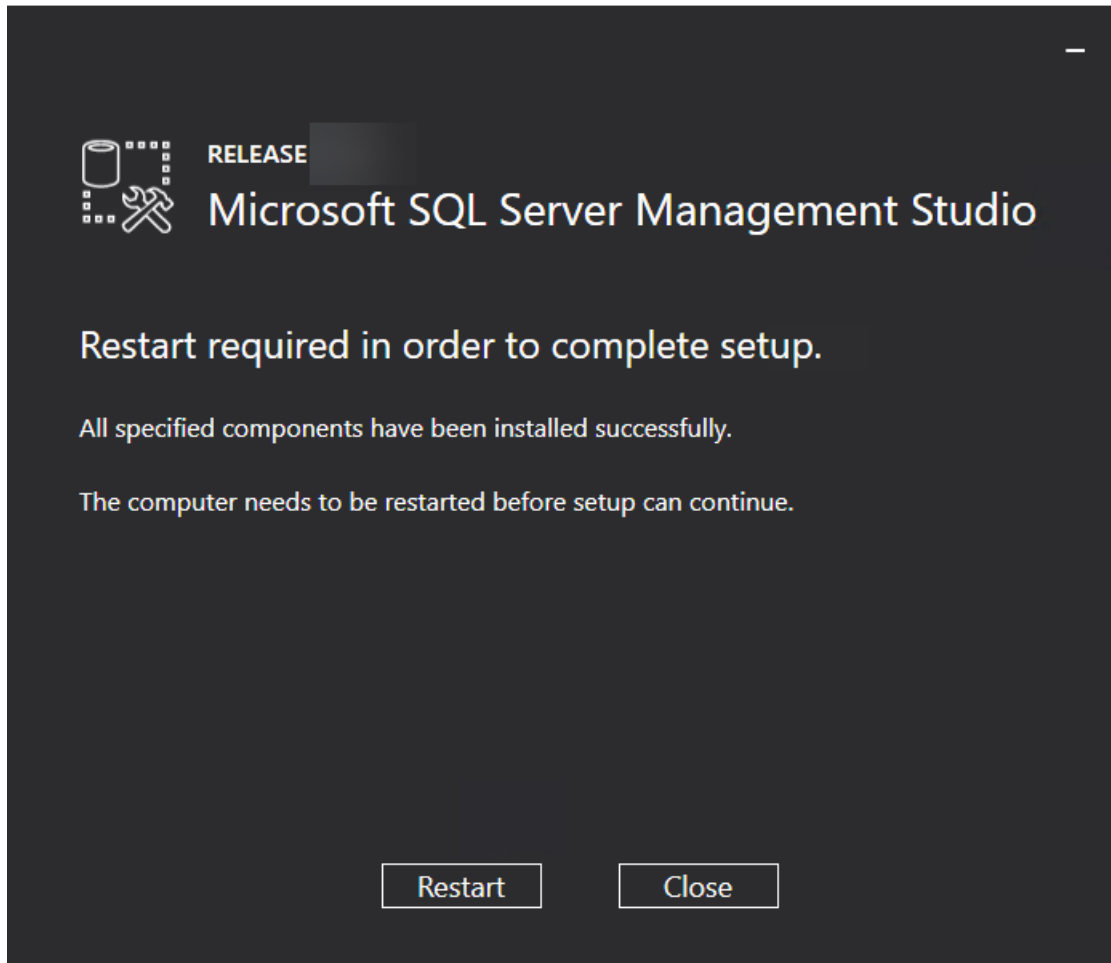


8. Click the **Download SQL Server Management Studio (Current release for production use)** link.

9. In the prompt below asking **Do you want to run or save SSMS-Setup-ENU.exe**, click **Save** (just in case).
10. Wait for the download to complete.
11. Once the download completes, move to the **SSMS-Setup-ENU.exe download has completed** prompt, and click **Run**.
12. In the **Welcome** dialog box, review the information, then click **Install**.

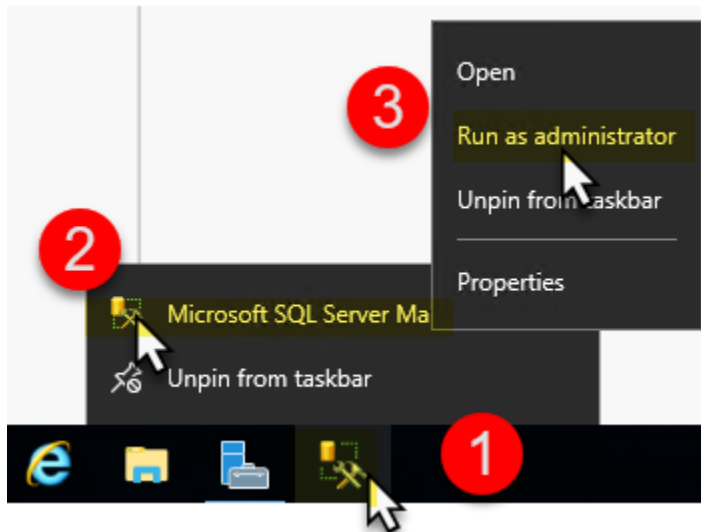


13. Once the installation completes, you will see a **Restart required in order to complete setup** dialog box, then click **Restart**.

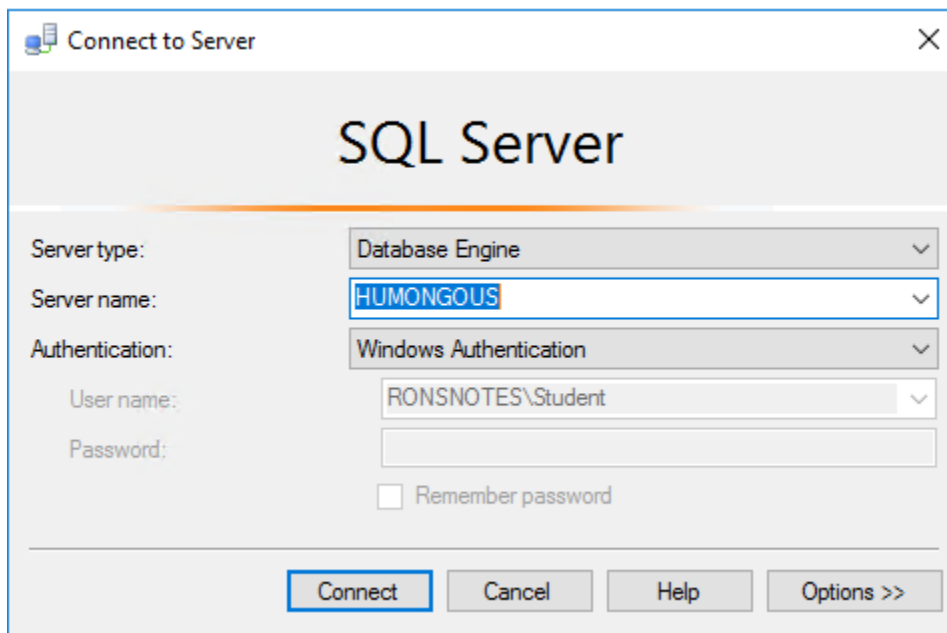


14. When the virtual machine comes back up, click **Other user** in the lower-left corner, then log in as **Student**.
15. Press the **Windows** key, then enter SQL.
16. Right-click **Microsoft SQL Server Management Studio**, then click **Pin to taskbar**.
17. Press **Esc** to return to desktop view.

18. Right-click the **Microsoft SQL Server Management Studio** icon in the taskbar, right-click the new **SQL Server Management Studio** icon showing, and click **Run as administrator**.

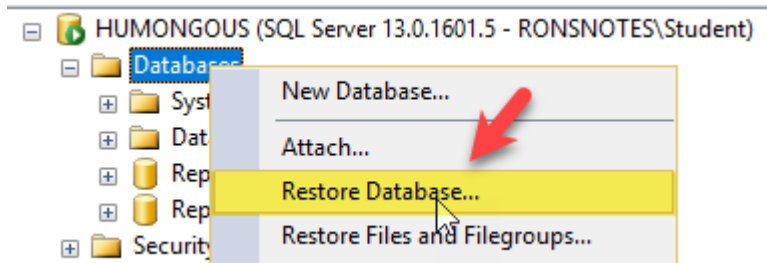


19. In the **User Account Control** dialog box, click **Yes**.
20. In the **Connect to Server** dialog box, review the current settings, then click **Connect**.

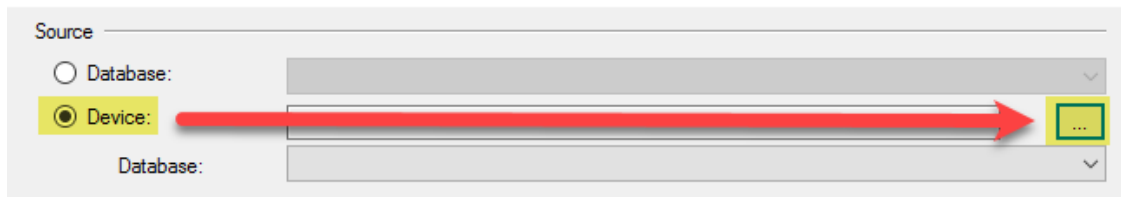


21. Minimize **Microsoft SQL Server Management Studio**.
22. Switch to your host machine and navigate to the downloaded database backup files (**DB Backups** folder).
23. Right-click the **DB Backups** folder, then click **Copy**.
24. Switch to **Humongous** virtual machine.
25. Open **File Explorer** and navigate to **C:**.
26. Paste in the **DB Backups** folder.
27. Double-click to open **DB Backups** folder.
28. Open a new instance of **File Explorer**, navigate to **C:\Program Files\Microsoft SQL Server\MSSQL13.MSSQLSERVER\MSSQL\Backup**.

29. In the **you don't currently have permission to access this folder** dialog box, click **Continue**.
30. Back in **DB Backups** folder, double-click to open the **Adventure Works 2014 Full Database Backup** folder.
31. Click to select **AdventureWorks2014.bak**, then right-click the file and click **Copy**.
32. Paste the files in **C:\Program Files\Microsoft SQL Server\MSSQL13.MSSQLSERVER\MSSQL\Backup**.
33. Switch back to **DB Backups** folder, double-click to open the **Adventure Works DW 2014 Full Database Backup** folder.
34. Click to select **AdventureworksDW2014.bak**, then right-click the file and click **Copy**.
35. Paste the files in **C:\Program Files\Microsoft SQL Server\MSSQL13.MSSQLSERVER\MSSQL\Backup**.
36. Switch back to **Microsoft SQL Server Management Studio**, navigate to the **Object Explorer** pane, right-click **Databases** and click **Restore Database ...**.

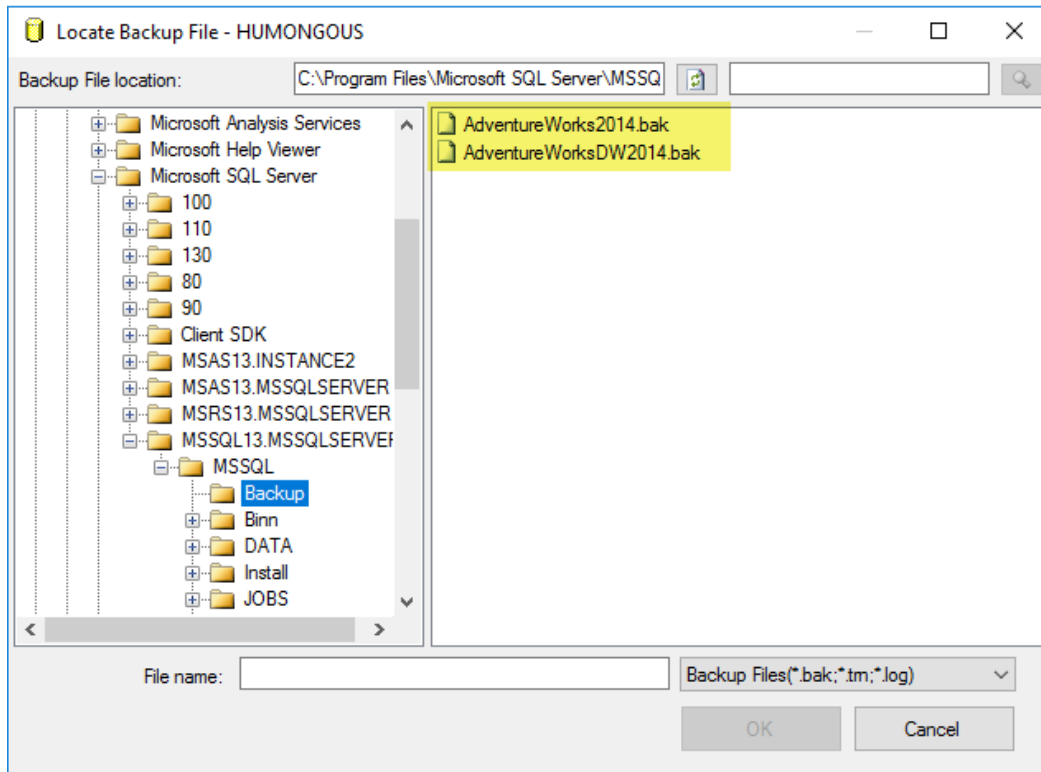


37. In the **Restore Database** dialog box, click the **Device** radio button and the corresponding ellipses.

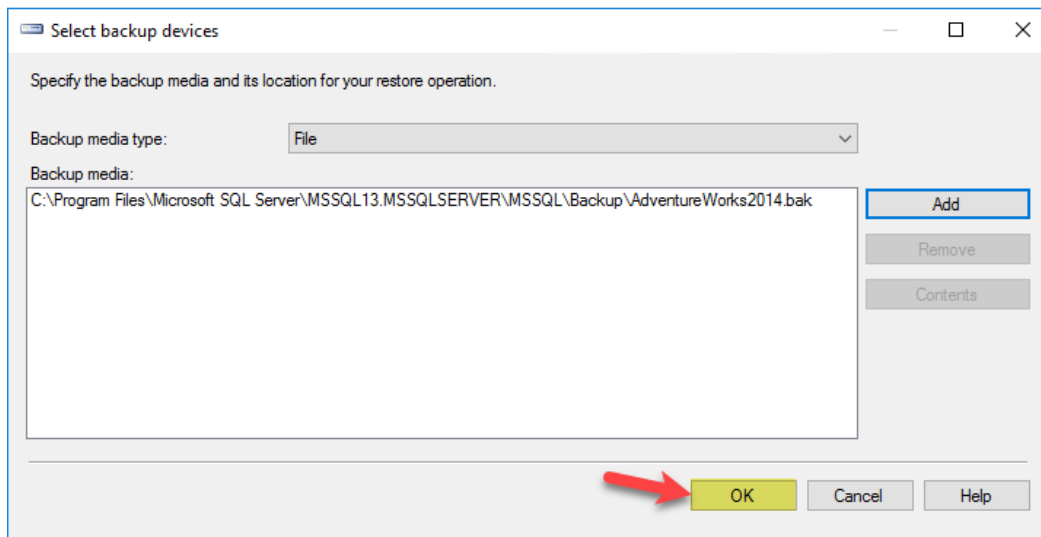


38. In the **Select backup devices** dialog box, click **Add**.

39. In the **Locate Backup File - HUMONGOUS** dialog box, notice both files are listed.

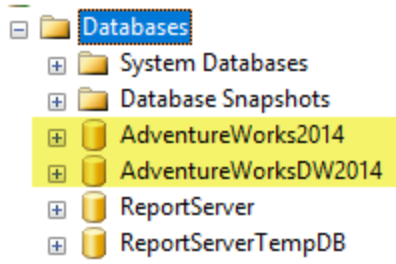


40. Double-click **AdventureWorks2014.bak** and in the **Select backup devices** dialog box, click **OK**.

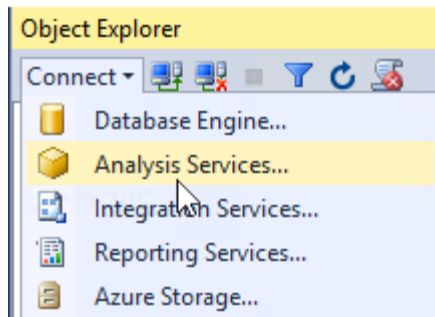


- 41. In the **Restore Database-AdventureWorks2014** dialog box, click **OK**.
- 42. In the dialog box stating **Database 'AdventureWorks2014' restored successfully**, click **OK**.
- 43. Move back to **Microsoft SQL Server Management Studio**, navigate to the **Object Explorer** pane, right-click **Databases** and click **Restore Database**
- 44. In the **Restore Database** dialog box, click the **Device** radio button and the corresponding ellipses.
- 45. In the **Select backup devices** dialog box, click **Add**.
- 46. In the **Locate Backup File - HUMONGOUS** dialog box, double-click **AdventureWorksDW2014**.

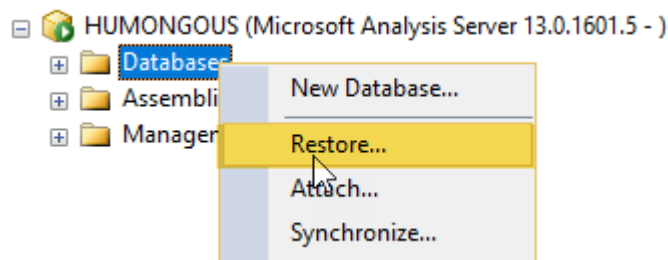
47. In the **Select backup devices** dialog box, click **OK**.
48. In the **Restore Database-AdventureWorksDW2014** dialog box, click **OK**.
49. In the dialog box stating **Database 'AdventureWorksDW2014' restored successfully**, click **OK**.
50. In the **Object Explorer** pane, expand **Databases** folder and notice you now see both databases listed.



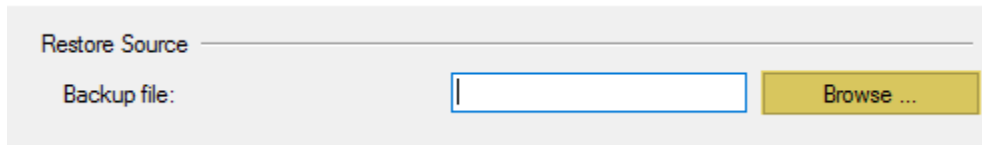
51. In a new instance of **File Explorer**, navigate to **C:\Program Files\Microsoft SQL Server\MSAS13.MSSQLSERVER\OLAP\Backup**.
52. In the **You don't currently have permission to access this folder** dialog box, click **Continue**.
53. Back in **C:\DB Backups**, double-click the **Adventure Works Multidimensional Model SQL 2014 Full Database Backups** folder.
54. Right-click **AdventureWorksDW2014Multidimensional-EE.abf** and click **Copy**.
55. Paste the file into **C:\Program Files\Microsoft SQL Server\MSAS13.MSSQLSERVER\OLAP\Backup**.
56. Switch back to **Microsoft SQL Server Management Studio** and in the **Object Explorer** pane, click **Connect**.
57. In the drop-down, click **Analysis Services...**



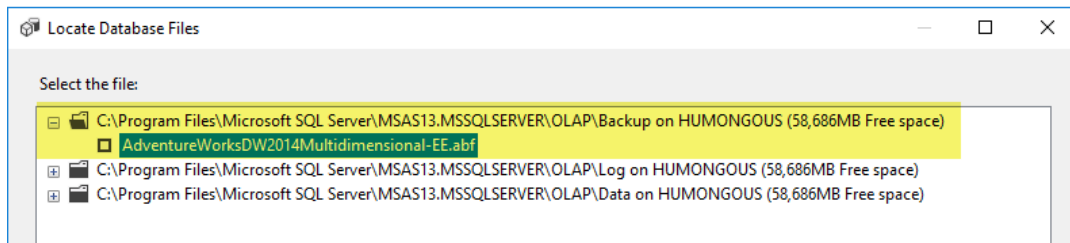
58. In the **Connect to Server** dialog box, click **Connect**.
59. In the **Object Explorer** pane, locate the **Databases** folder under **Humongous (Microsoft Analysis Services)**, right-click and click **Restore...**



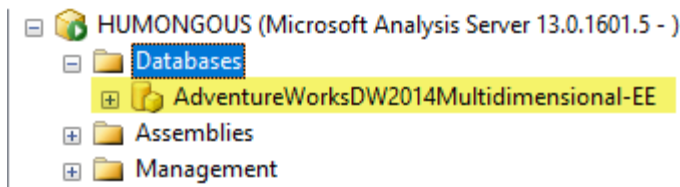
60. In the **Restore Database** dialog box, move to the **Restore Source** section and click the corresponding **Browse....**



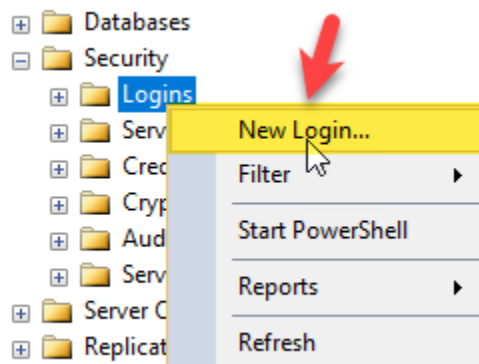
61. In the **Locate Database Files** dialog box, expand the first folder listed, double-click **AdventureWorksDW2014Multidimensional-EE.abf** and click **OK**.



62. Back in the **Restore Database** dialog box, click **OK**.
63. Upon completion (this may take some time), right-click **Databases** under **Humongous (Microsoft Analysis Services)**, and click **Refresh**.
64. Expand **Databases** under **Humongous (Microsoft Analysis Services)**, expand **AdventureWorksDW2014Multidimensional-EE.abf** and expand **Cubes**.
65. Notice **Adventure Works** is listed.



66.
67. In the **Object Explorer** pane on the left, expand **Security** folder.
68. Right-click **Logins** and click **New Login....**



69. In the **Login - New** dialog box, click **Search....**

Login - New

Select a page

- General
- Server Roles
- User Mapping
- Securables
- Status

Script Help

Login name: **Search...**

☒ Windows authentication
☐ SQL Server authentication

Password:
 Confirm password:
☐ Specify old password
 Old password:
☒ Enforce password policy
☒ Enforce password expiration
☒ User must change password at next login

☐ Mapped to certificate
☐ Mapped to asymmetric key
☐ Map to Credential **Add**

Credential	Provider
------------	----------

Remove

Default database:
 Default language:

OK **Cancel**

70. In the **Select User, Service Account, or Group** dialog box, click **Advanced...**

Select User, Service Account, or Group

Select this object type:

Object Types...

From this location:

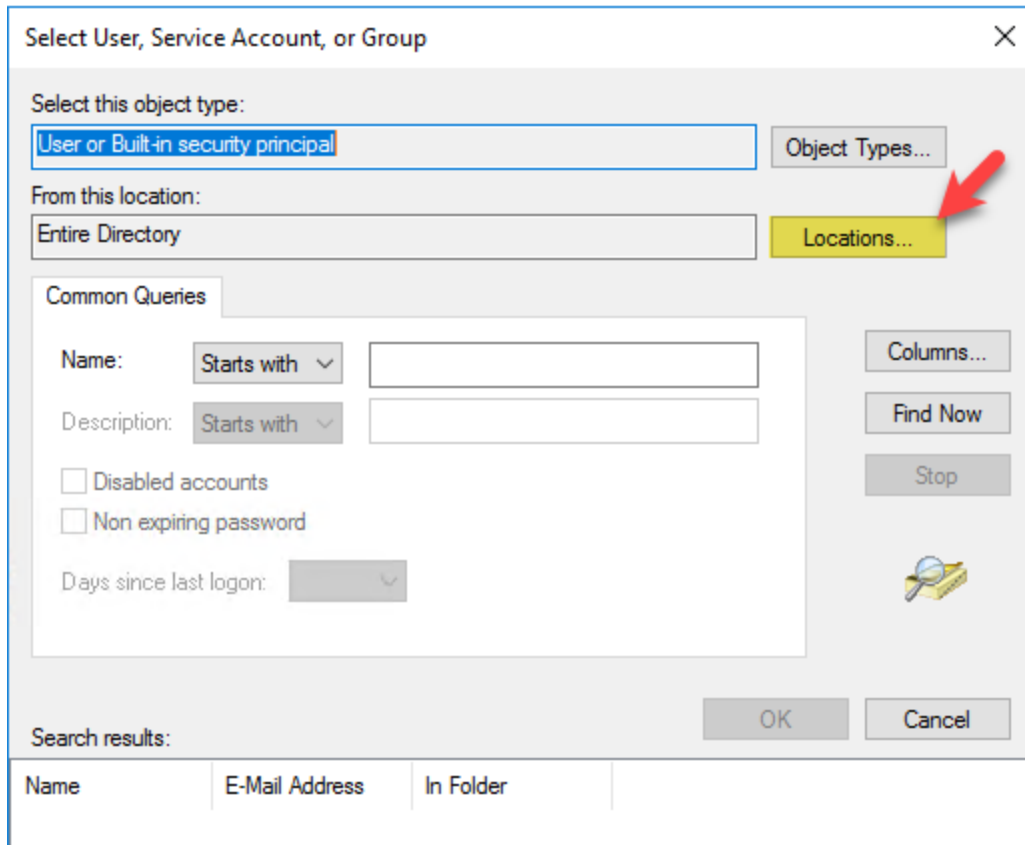
Locations...

Enter the object name to select (examples):

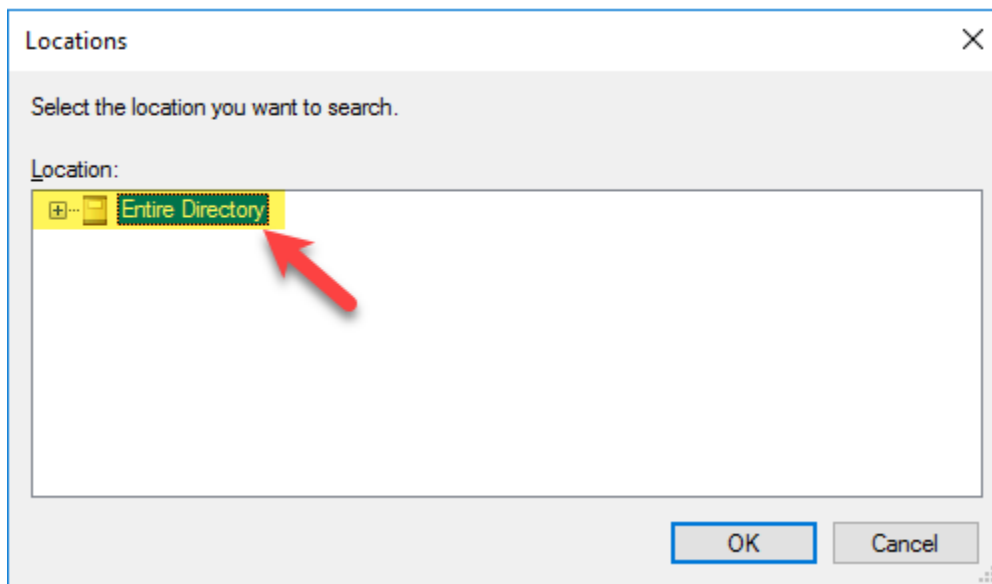
Check Names

Advanced... **OK** **Cancel**

71. Click **Locations...**



72. In the **Locations** dialog box, verify **Entire Directory** is selected, then click **OK**.



73. In the **Select User, Service Account, or Group** dialog box, move to the **Starts with** setting and enter SVC_Farm into the corresponding text box.

Select User, Service Account, or Group

Select this object type:
 User or Built-in security principal

From this location:
 Entire Directory

Common Queries

Name: Starts with **SVC_Farm**

Description: Starts with

☐ Disabled accounts

☐ Non expiring password

Days since last logon:

Find Now

Stop

OK

Cancel

Name	In Folder	E-Mail Address
SVC_Farm	RonsNotes.traini...	

74. Click **Find Now**.

75. Notice you now see **SVC_Farm** listed below in the **Search results**.

Search results:

Name	In Folder	E-Mail Address
SVC_Farm	RonsNotes.traini...	

76. Click **OK**.

77. Back in the **Select User, Service Account, or Group** dialog box, review the results.

Select User, Service Account, or Group

Select this object type:
 User or Built-in security principal

From this location:
 Entire Directory

Enter the object name to select (examples):
SVC_Farm

Check Names

Advanced...

OK

Cancel

78. Click **OK**.
79. Back in the **Login – New** dialog box, review the results, then click **OK**.

Login - New

Select a page

- General
- Server Roles
- User Mapping
- Securables
- Status

Script **Help**

Login name:

☒ Windows authentication
☐ SQL Server authentication

Password:

Confirm password:

☐ Specify old password

Old password:

☒ Enforce password policy
☒ Enforce password expiration
☒ User must change password at next login

☐ Mapped to certificate
☐ Mapped to asymmetric key
☐ Map to Credential

Mapped Credentials

Credential	Provider
------------	----------

Default database:

Default language:

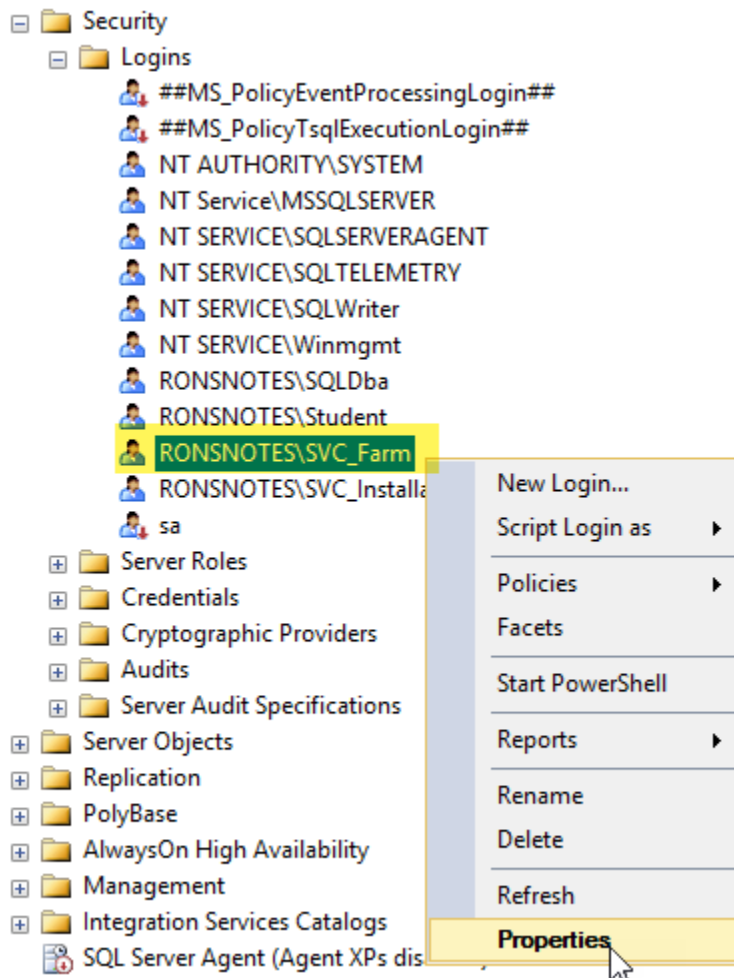
80. Repeat the prior twelve steps to create a login for **SVC_Installation**.

Search results:

Name	In Folder	E-Mail Address
SVC_Installation	RonsNotes.training.local/RN_Users/Svc_Accounts	

81. Move back to the **Object Explorer** pane on the left and expand **Logins** folder.

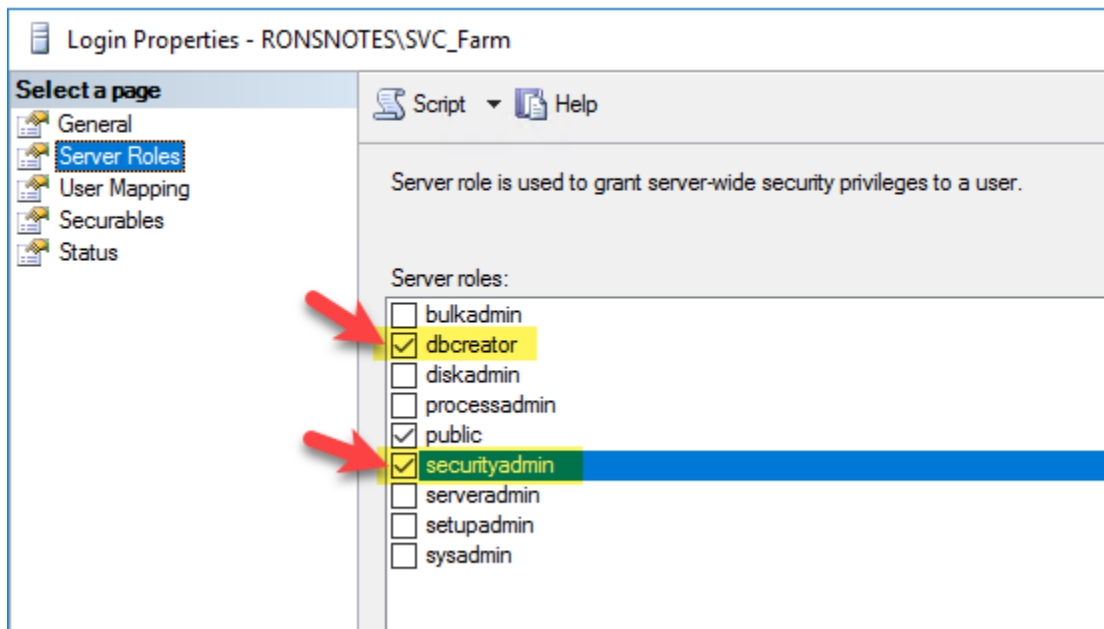
82. Right-click **RONSNOTES\SVC_Farm** and click **Properties**.



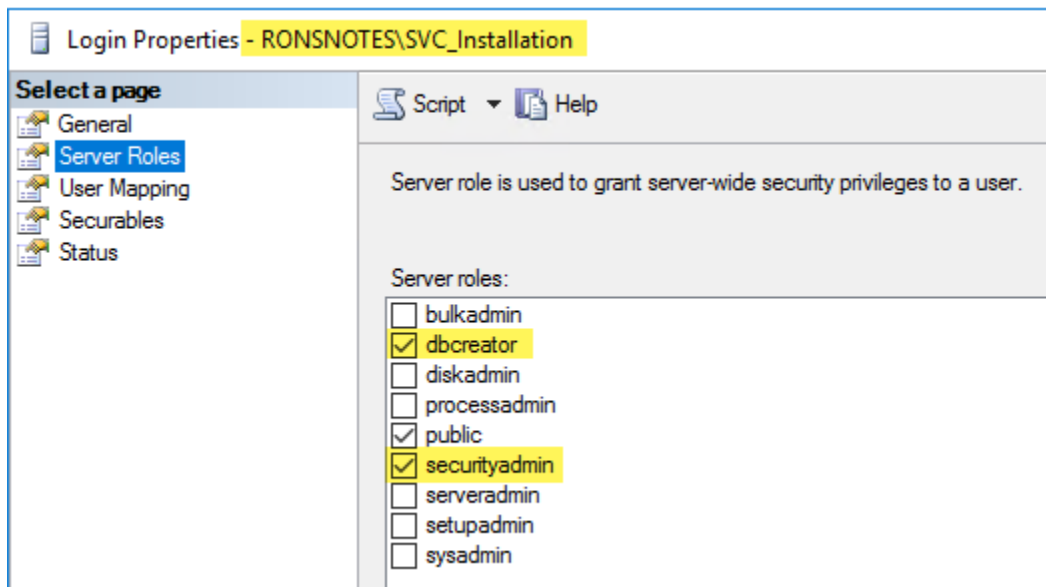
83. When the **Login Properties – RONSNOTES\SVC_Farm** dialog box opens, review the settings and options available.

84. Move to the pane on the left and click **Server Roles**.

85. Navigate to the **Server roles** setting and place a check in both the **dbcreator** and **securityadmin** check boxes.



86. Click **OK**.
87. Repeat the last five steps for **SVC_Installation**.



88. Close **SSMS**.
89. Restart the virtual machine.
90. When the virtual machine comes back up, log on as **Student**.
91. Open **File Explorer** and double-click the drive containing **SQL2016_x64_ENU**.
92. Double-click **setup**.
93. In the **User Account Control** dialog box, click **Yes**.
94. In **SQL Server Installation Center**, click **Installation** tab.

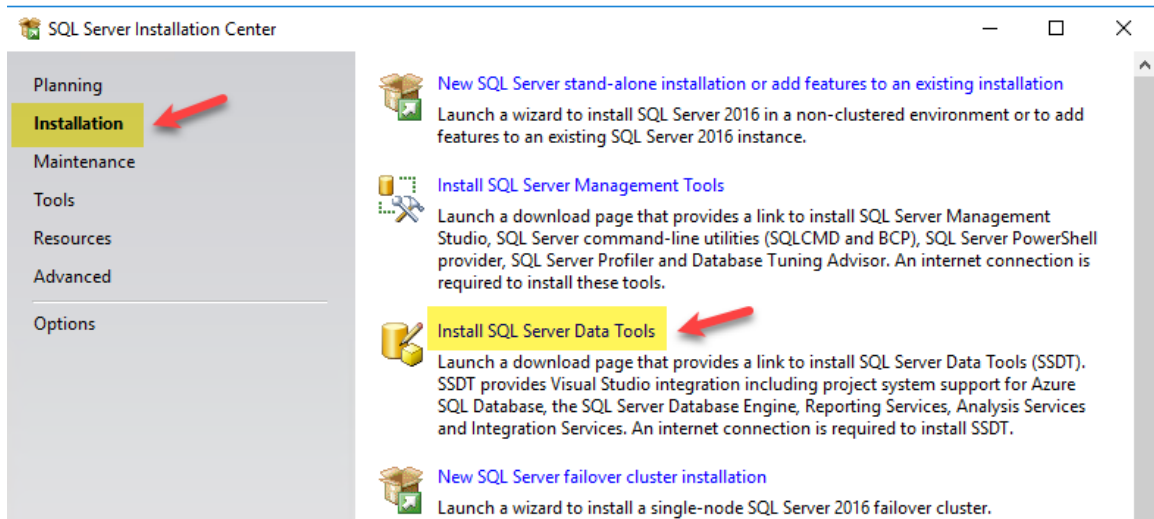
Task: Install SQL Server Data Tools

There is no PowerShell script equivalent to this task.

1. Click **Install SQL Server Data Tools** link.

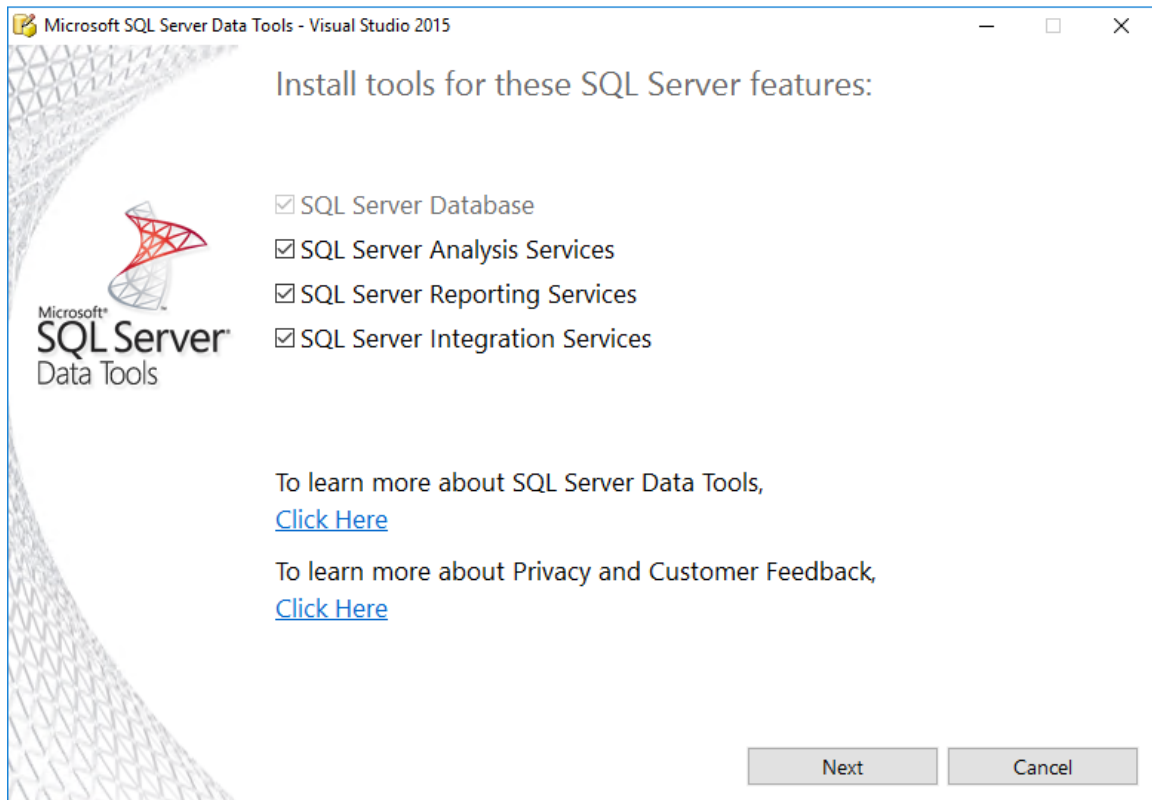


If you receive the Internet Explorer settings dialog box, move the radio button to Don't use recommended settings and click OK.

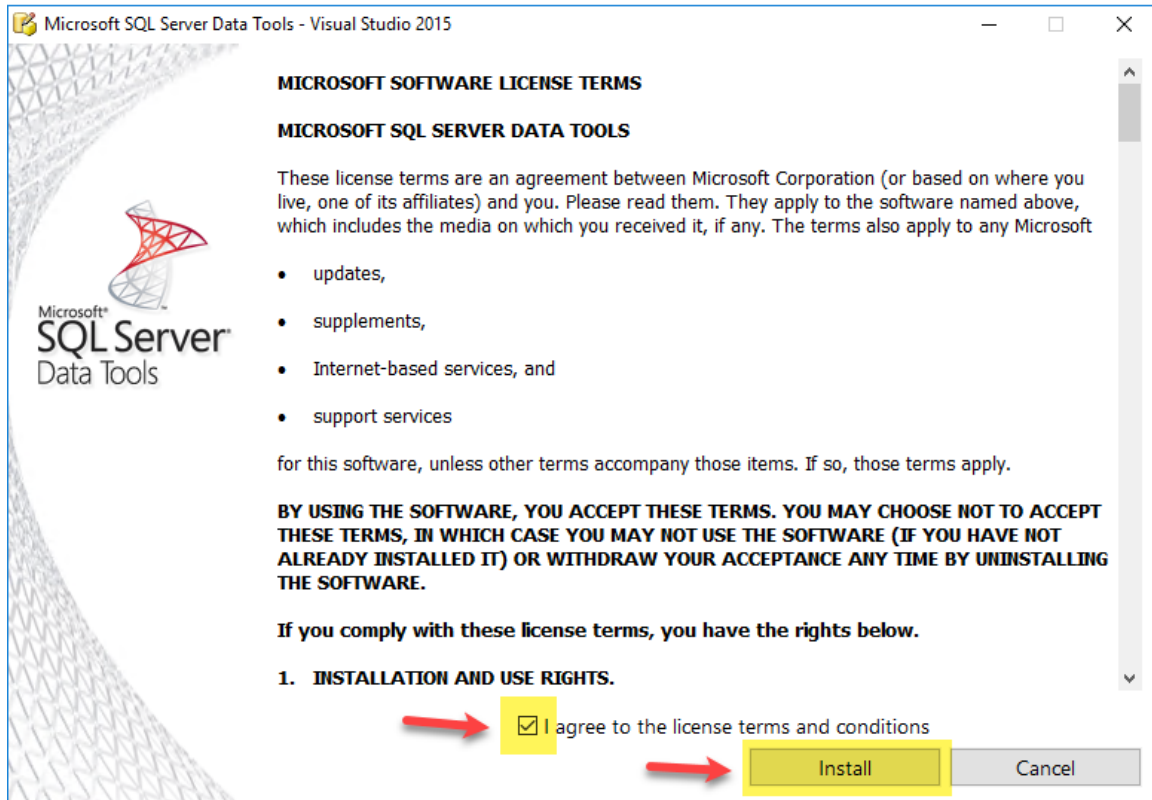


2. Click the **Download SQL Server Data Tools (Current release for production use)** link.
3. Click **Download SQL Server Data Tools**.
4. In the prompt below asking **Do you want to run or save SSDTSetup.exe**, click **Save** (just in case).
5. Wait for the download to complete.
6. Once the download completes, move to the **SSDTSetup.exe download has completed** prompt, and click **Run**.

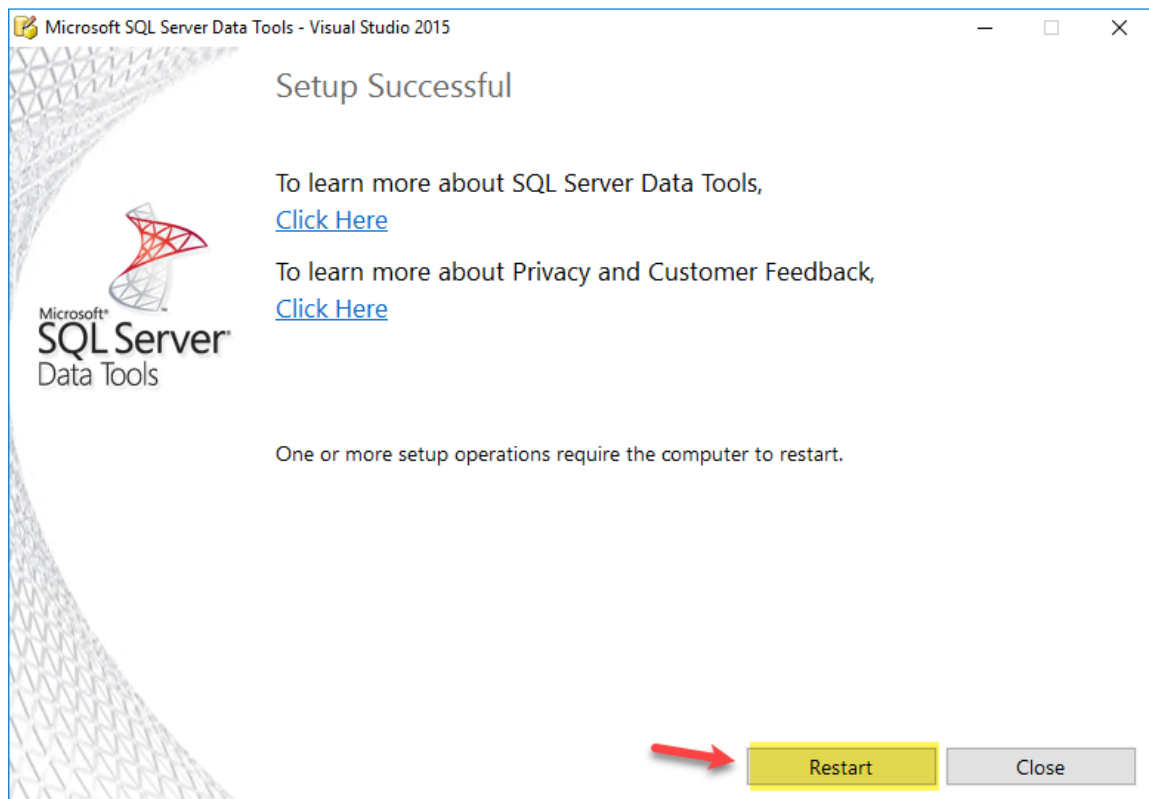
7. In the **Install tools for these SQL Server features** dialog box, review the information and click **Next**.



8. In the **Microsoft Software License Terms** dialog box, place a check in the **I agree to the license terms and conditions** check box.
9. Click **Install**.



10. In the **Setup Successful** dialog box, click **Restart**.



11. When the virtual machine comes back up, click **Other user** in the lower-left corner, then log in as **Student**.
12. Press the **Windows** key, then enter **SQL Server Data**.
13. Right-click **SQL Server Data Tools 2015**, then click **Pin to taskbar**.
14. Press **Esc** to return to desktop view.

Lab Files

Switch to your host machine, navigate to the downloaded/cloned repository files, then copy the **Lab Files** folder and paste it into **C:** drive on the **Humongous** virtual machine.