



DAT225x

Developing an Analysis Services Tabular Model

Lab 01 | Getting Started

Estimated time to complete this lab is 60 minutes

Overview

In this lab, you will provision a Microsoft Azure Virtual Machine (VM) that will be used by all labs in this course. Once the VM is provisioned, you will complete the setup required to support the labs.

The labs in this course are accumulative. You cannot complete the following labs if this lab has not been successfully completed.

What You'll Need

To complete this lab, you will need the following:

- High-speed and reliable internet connectivity (for remote connections to the VM)
- A second monitor is recommended (for the Remote Desktop connection)
- A Microsoft account (such as one used for outlook.com, Hotmail, or other Microsoft services)
- A Microsoft Azure subscription
- The lab files for this course (available for download from GitHub, as described in this lab)

Creating a Free Trial Azure Subscription

If you already have an Azure subscription, you can skip this section. Otherwise, follow these steps to create a free trial subscription. You will need to provide a valid credit card number for verification, but you will not be charged for Azure services—for more information, refer to <https://aka.ms/dat225xaz>. Note that the free trial is not available in all regions.

If you already have a Microsoft account that has not already been used to sign up for a free Microsoft Azure trial subscription, you're ready to get started. If not, don't worry—just create a new Microsoft account at <https://signup.live.com>.

After you've created a Microsoft account, browse to <https://aka.ms/dat225xaz> and then click the **Start Free** link. Then follow the instructions to sign up for a free trial subscription to Microsoft Azure. You'll need to sign in with your Microsoft account if you're not already signed in. Then you'll need to:

- Enter your cellphone number and have Microsoft send you a text message to verify your identity
- Enter the verification code sent to you
- Provide valid payment details—don't worry, your credit card won't be charged for any services you use during the trial period, and the account is automatically deactivated at the end of the trial period, unless you expressly decide to keep it active.

Exercise 1: Provisioning an Azure VM

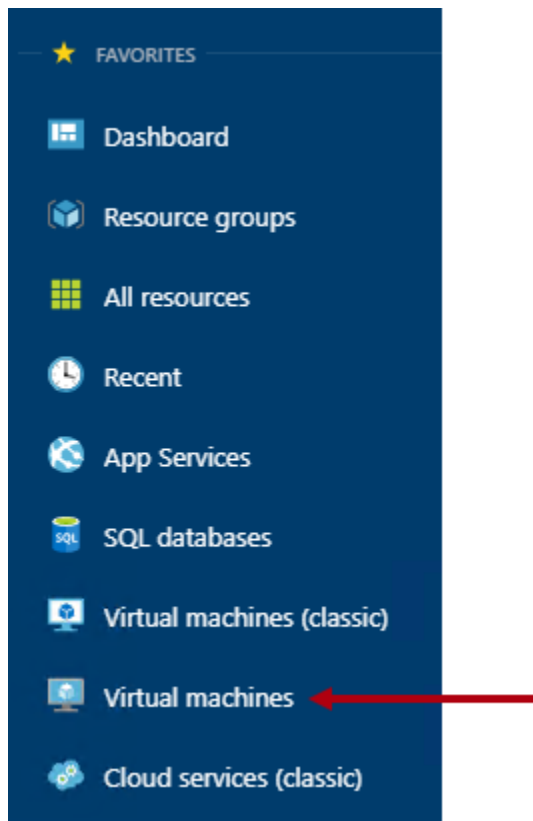
In this exercise, having signed in to the Azure Portal by using your Azure subscription, you will provision an Azure VM to support all labs for this course.

The Azure VM should be stopped when you have completed a lab so that your subscription is not charged (for free trial subscriptions, this will ensure you will have sufficient credits left to complete the labs over the duration of the course).

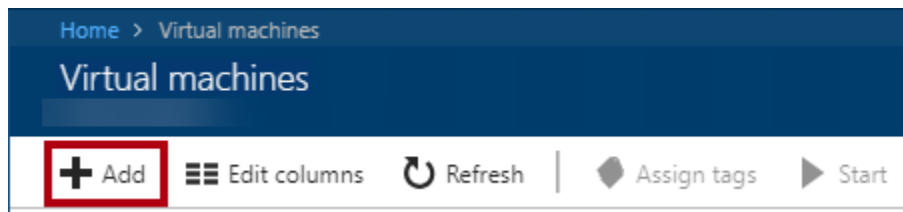
Provisioning an Azure VM

In this task, you will sign in to the Azure Portal, and then provision an Azure VM.

1. In a web browser, navigate to <https://portal.azure.com>.
2. Sign in to the **Azure Portal** by using your subscription.
3. In the left pane, select **Virtual Machines**.











4. In the **Virtual Machines** blade, click **Add**.

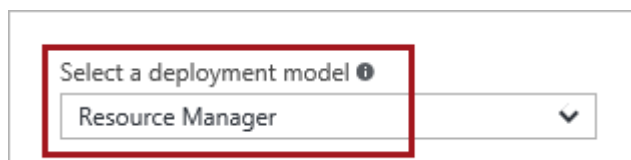


5. In the **Compute** blade, in the search box, enter the search text **Free SQL Server 2017**, and then press **Enter**.

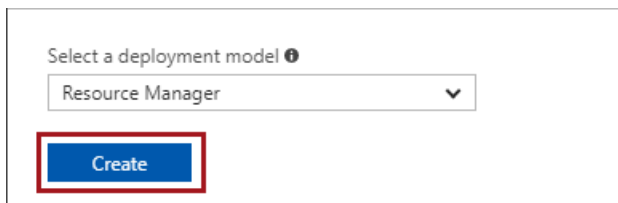
6. Select the **Free SQL Server License: SQL Server 2017 Developer on Windows Server 2016** image.

NAME	PUBLISHER	CATEGORY
 Free SQL Server License: SQL Server 2017 Developer on Ubuntu Server 16.04 LTS	Microsoft	Linux based
 Free SQL Server License: SQL Server 2017 Developer on Red Hat Enterprise Linux 7.4 (RHEL)	Microsoft	Linux based
 Free SQL Server License: SQL Server 2017 Express on Windows Server 2016	Microsoft	Windows based
 Free SQL Server License: SQL Server 2017 Developer on Windows Server 2016	Microsoft	Windows based
 Free SQL Server License: SQL Server 2017 Developer on SUSE Linux Enterprise Server (SLES) 12 SP2	Microsoft	Linux based
 Free SQL Server License: SQL Server 2017 Express on SUSE Linux Enterprise Server (SLES) 12 SP2	Microsoft	Linux based
 Free SQL Server License: SQL Server 2017 Express on Ubuntu Server 16.04 LTS	Microsoft	Linux based
 Free SQL Server License: SQL Server 2017 Express on Red Hat Enterprise Linux 7.4 (RHEL)	Microsoft	Linux based

7. In the image blade, review the text that describes the virtual machine setup.
8. In the lower section of the blade, in the **Select a Deployment Model** dropdown list, ensure that **Resource Manager** is selected.



9. To provision the virtual machine, click **Create**.



Select a deployment model ⓘ

Resource Manager ▼

Create

10. Notice that the **Create Virtual Machine** blade opens, and that also the **Basics** blade (step 1) opens.
11. In the **Basics** blade, in the **Name** box, enter a name for the virtual machine (this will become the name of the machine to which you will connect).
12. In the **VM Disk Type** dropdown list, select **HDD**.



VM disk type ⓘ

HDD ▼

13. In the **User Name** box enter **VM-Admin**.
14. In the password boxes, enter and confirm an appropriate password.

This will become the machine administrator account password. Note that the password must be at least 12 characters in length, and must have three of the following: one lower case character, one upper case character, one number, or one special character.

Be sure to permanently record these credentials, as you will be required to use them to sign in every time you will connect to the VM.

15. In the **Resource Group** box, enter **Lab**.
16. In the **Location** box, select a data center that is near you.
17. Click **OK**.



OK

18. In the **Size** blade (step 2), scroll down to locate and select a **Standard** size VM which provides at least 2 vCPUs and 8GB RAM (like **D2s_v3**, if available).

The labs in this course will not require excessive storage, memory or processing. Also, you will be prompted to deallocate your VM between labs, and so the monthly cost you see will only apply when the VM is running.

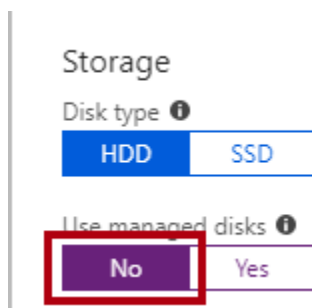
Available						
B2s	Standard	General purpos	2	4	4	
B2ms	Standard	General purpos	2	8	4	
B4ms	Standard	General purpos	4	16	8	
B8ms	Standard	General purpos	8	32	16	
D2s_v3	Standard	General purpos	2	8	4	
D4s_v3	Standard	General purpos	4	16	8	

19. Click **Select**.

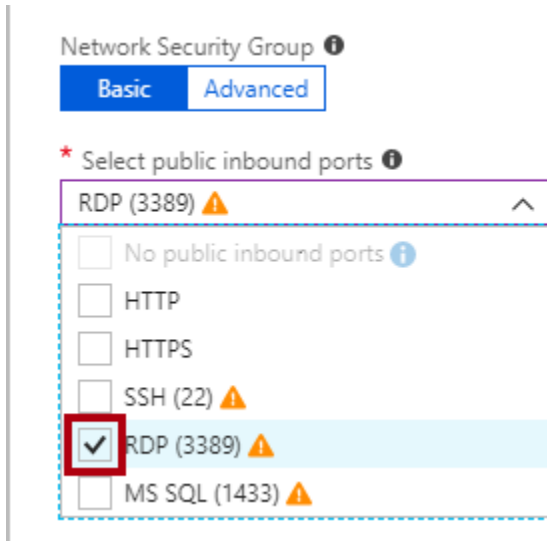


20. In the **Settings** blade (step 3), if prompted with a warning message about the use of standard disks, ignore this message.

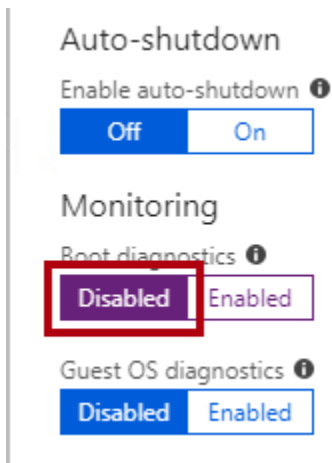
21. For **Use Managed Disks**, select **No**.



22. In the **Select Public Inbound Ports** dropdown list (you may need to scroll down to locate the dropdown list), select **RDP**.



23. For **Monitoring, Boot Diagnostics** (again, scroll down), select **Disabled**.



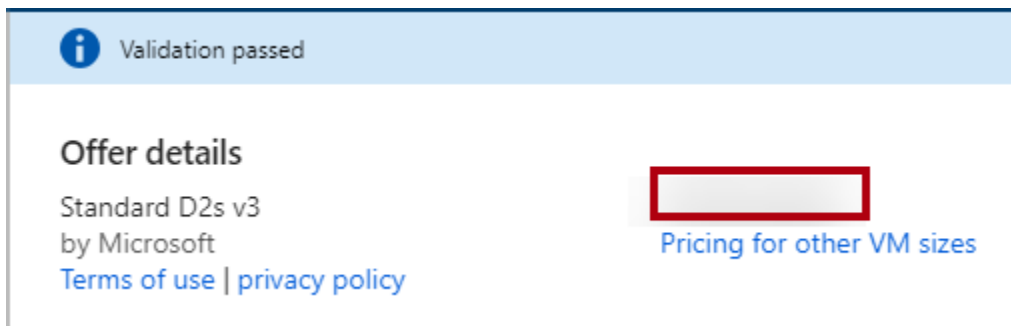
24. Click **OK**.



25. In the **SQL Server Settings** blade (step 4), to accept the default settings, click **OK**.

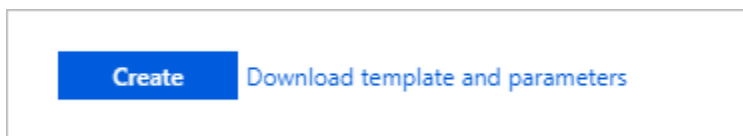


26. In the **Summary** blade, take note of the pricing for the VM.



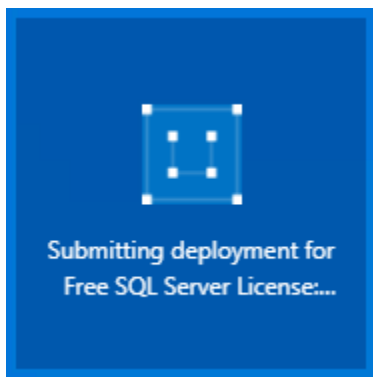
To minimize cost, the lab instructions will encourage you to stop and deallocate the VM when it is not being used.

27. If you agree to the pricing and terms of use, click **Create**.



*While the VM is being provisioned, you are directed to the **Azure Portal** dashboard.*

28. On the **Azure Portal** dashboard, notice the tile displaying the status of the deployment process.



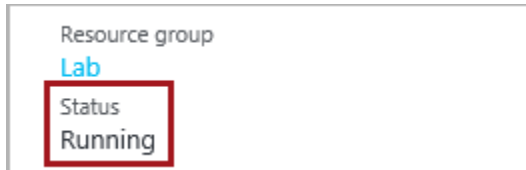
The deployment usually takes 15-20 minutes to complete, and this time depends largely on the VM size selected. The VM blade will open when the deployment completes.

You cannot proceed to the next task until the deployment completes.

Connecting to the VM

In this task, once the VM has successfully deployed, you will connect to the VM.

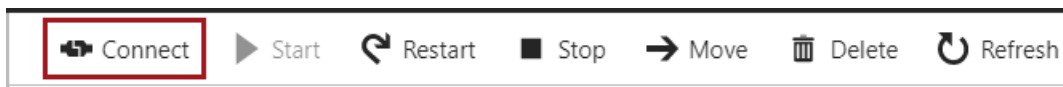
1. In the **Azure Portal**, notice that the VM blade automatically opens, and that the VM status is **Running**.



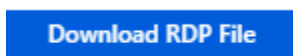
*You are charged when the VM status is **Running**, but you are not charged—except for a relatively smaller storage cost—when the VM status is **Stopped (Deallocated)**.*

At the end of this lab, there will be instructions to guide you on how to stop and optionally deallocate the VM. You should consider doing this if you choose to commence the next lab at a much later time.

2. To connect to the VM, click **Connect**.



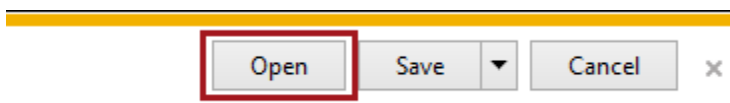
3. In the **Connect to Virtual Machine** pane (located at the right), click **Download RDP File**.



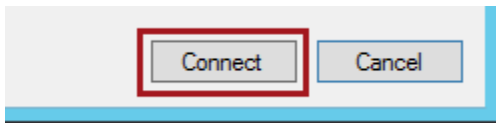
A Remote Desktop File (.rdp) file is downloaded to your computer.

This file can be used to reconnect to the remote desktop session, but note that if you deallocate the VM and later re-start the VM, it will be likely that a different IP address will be assigned.

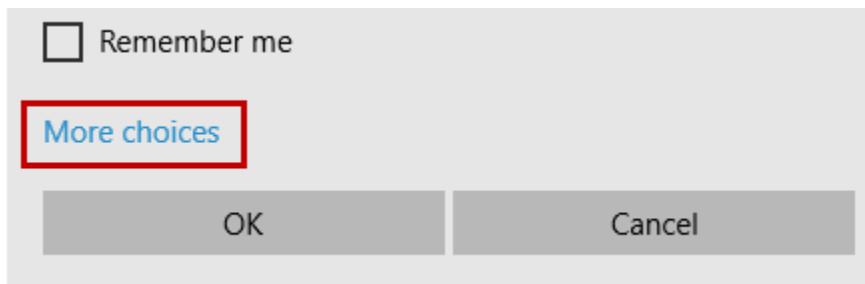
4. If prompted by the web browser to open the Remote Desktop File, click **Open**, otherwise, locate the downloaded file, and then double-click it.



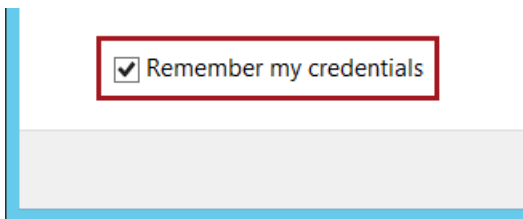
5. If prompted to connect to the unknown publisher, click **Connect**.



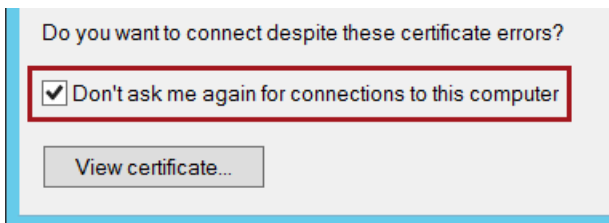
*You need to enter the VM administrator credentials. If the authentication window defaults to an existing account, you will need to select **More Choices**, and then select **Use a Different Account**.*



6. In the **Windows Security** window, enter the user name **VM-Admin**, and the password you used to create the VM in the previous task.
7. Check the **Remember My Credentials** checkbox.



8. Click **OK**.
9. In the **Remote Desktop Connection** window, check the **Don't Ask Me Again for Connections to This Computer** checkbox.



10. Click **Yes**.
11. If you have a second monitor, maximize the Remote Desktop window inside a single monitor.

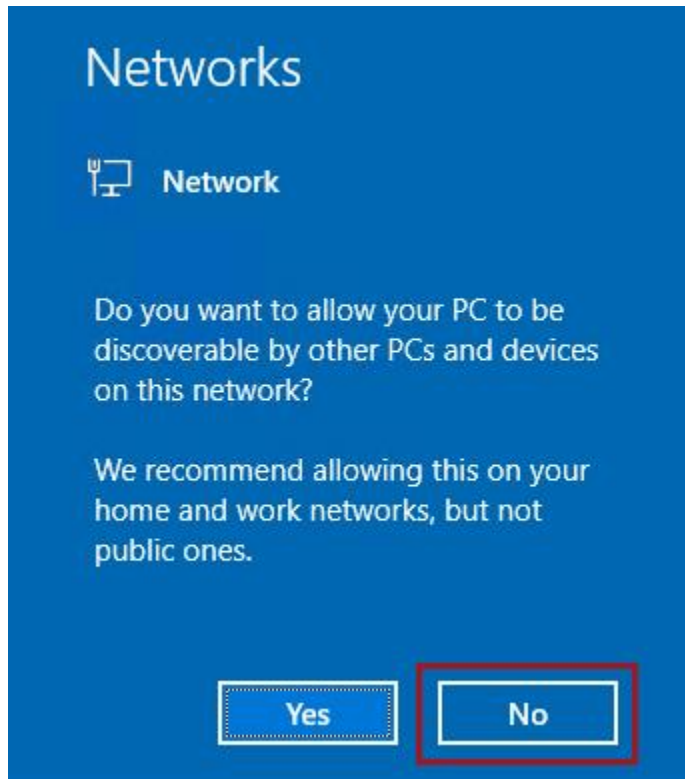
Exercise 2: Setting Up the Azure VM

In this exercise, you will complete several VM setup tasks.

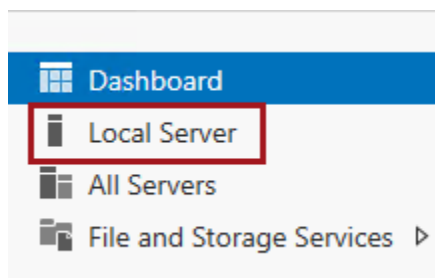
Configuring the Server

In this task, you will configure the server to support the lab experience.

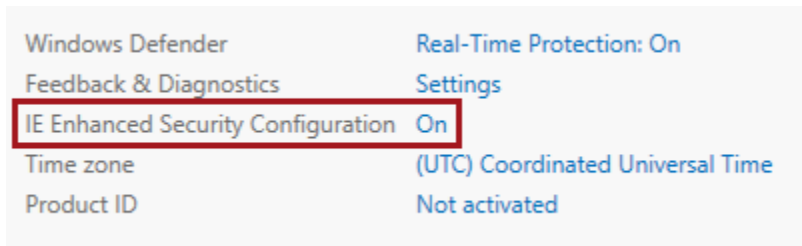
1. In the Remote Desktop window, when the **Networks** panel opens at the right, to ensure that the machine is not discoverable by other machines, click **No**.



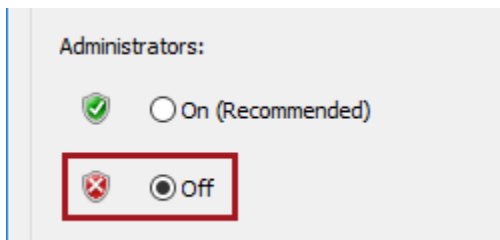
2. Wait until **Server Manager** opens (it will open automatically).
3. In **Server Manager**, in the left pane, select **Local Server**.



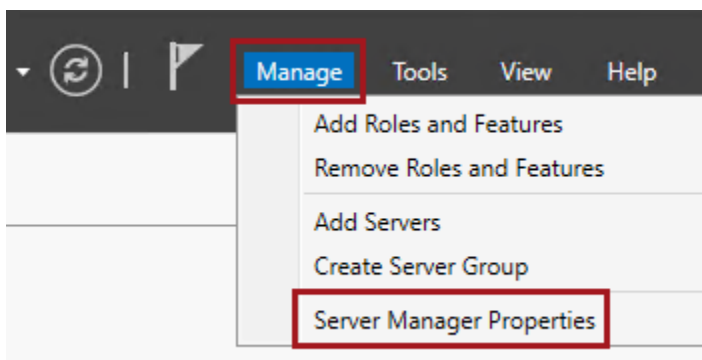
4. In the **Properties** pane, notice that **IE Enhanced Security Configuration** is set to **On**.



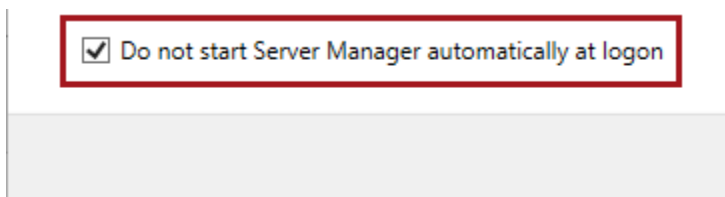
5. Click the **On** link.
6. In the window, for **Administrators**, select the **Off** option.



7. Click **OK**.
8. Located at the top-right corner, select **Manage**, and then select **Server Manager Properties**.

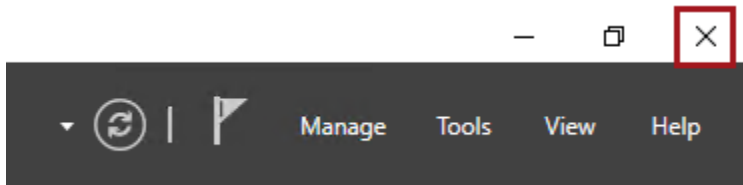


9. In the window, check the **Do Not Start Server Manager Automatically at Logon**.



10. Click **OK**.

11. To close Server Manager, located at the top-right corner, click **X**.

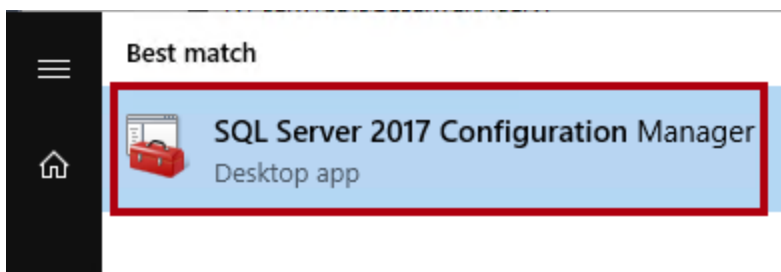


Starting Analysis Services

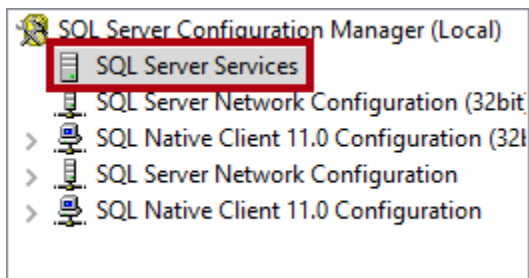
In this task, you will start Analysis Services, and then set the service to start automatically.

The Azure VM has Analysis Services already installed in Tabular mode, however the service is stopped and not set to start automatically.

1. To open SQL Server 2017 Configuration Manager, at the bottom-left corner, click the Windows icon, and then type **SQL Server 2017 Configuration**.
2. From the best match result, select **SQL Server 2017 Configuration Manager**.



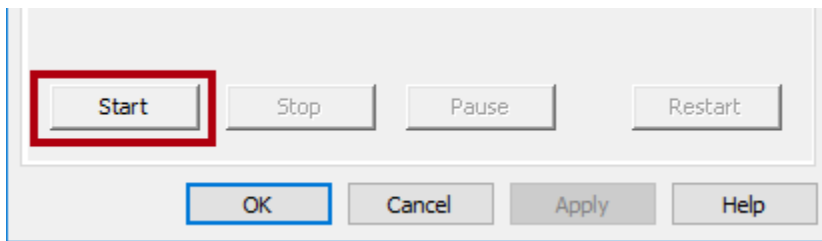
3. In SQL Server 2017 Configuration Manager, in the left pane, select **SQL Server Services**.



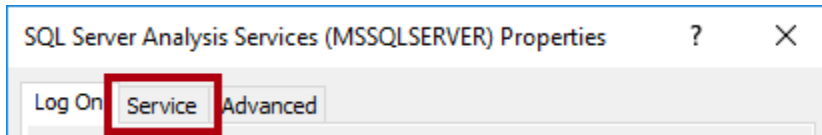
4. In the right-pane, double-click **SQL Server Analysis Services (MSSQLSERVER)**.

Name	State	Start Mode
SQL Server Integration Services 14.0	Running	Automatic
SQL Full-text Filter Daemon Launcher (MSSQL...	Running	Manual
SQL Server Launchpad (MSSQLSERVER)	Stopped	Manual
SQL Server (MSSQLSERVER)	Running	Automatic
SQL Server Analysis Services (MSSQLSERVER)	Stopped	Manual
SQL Server Browser	Running	Automatic
SQL Server Agent (MSSQLSERVER)	Stopped	Manual

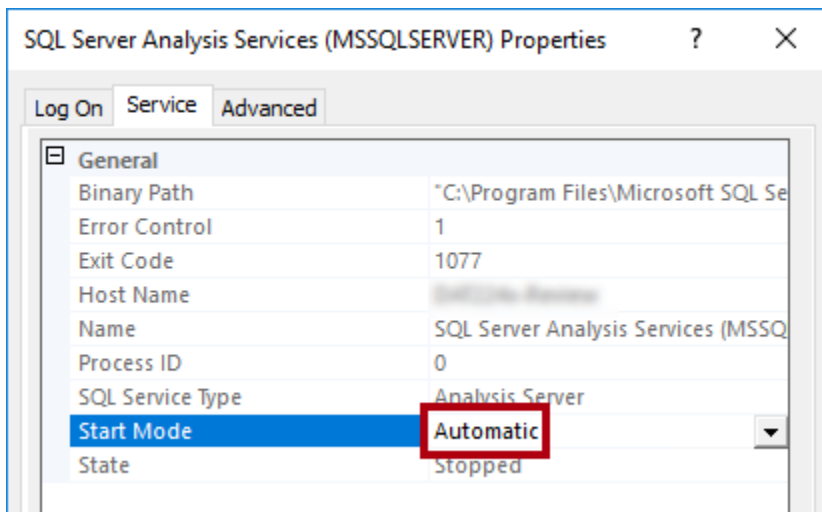
5. In the **SQL Server Analysis Services (MSSQLSERVER) Properties** window, click **Start**.



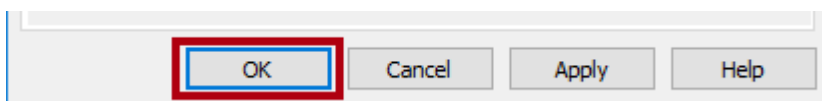
6. When the service has started, select the **Service** tab.



7. Set the **Start Mode** property to **Automatic**.



8. Click **OK**.

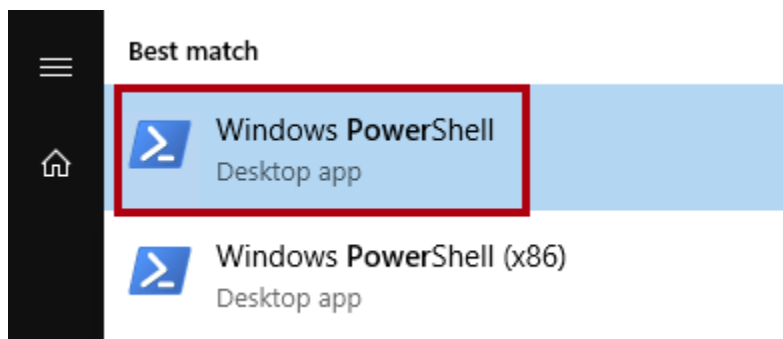


9. To close SQL Server 2017 Configuration Manager, on the **File** menu, select **Exit**.

Installing the SQL Server Module

In this task, you will install the PowerShell SQL Server module.

1. To open PowerShell, at the bottom-left corner, click the Windows icon, and then type **Power**.
2. From the best match result, select **Windows PowerShell**.



3. In the Windows PowerShell window, enter the following command:

PowerShell

```
Install-Module -Name SqlServer -AllowClobber
```

This command will install the PowerShell SQL Server module, required to invoke an Analysis Services command later in this lab.

4. When prompted to install the NuGet provider, enter **Y**, and then press **Enter**.
5. When prompted to trust the repository, enter **A**, and then press **Enter**.
6. When the installation has completed, close the Windows PowerShell window.

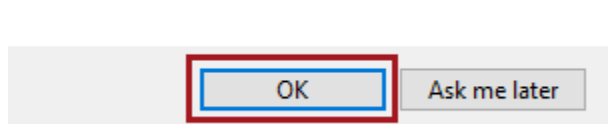
Installing the Lab Resources

In this task, you will download and extract the lab resources that support the labs.

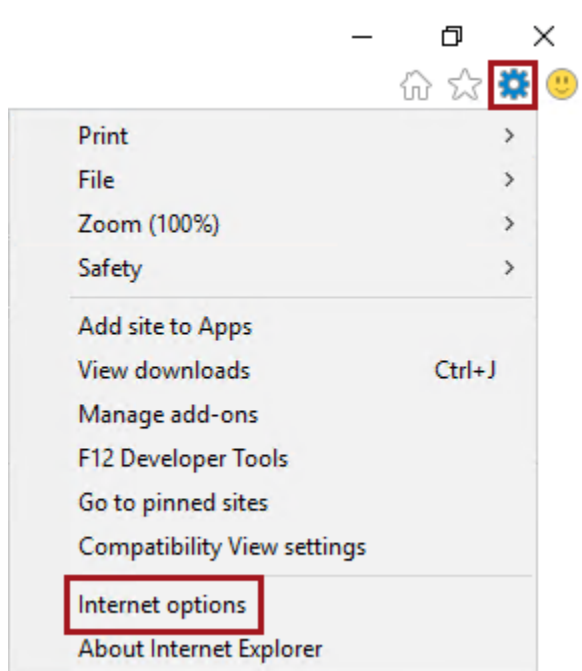
1. To open Internet Explorer, on the taskbar, click the **Internet Explorer** shortcut.



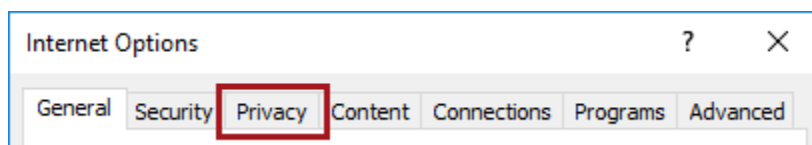
2. In the **Internet Explorer 11** window, to accept the recommended settings, click **OK**.



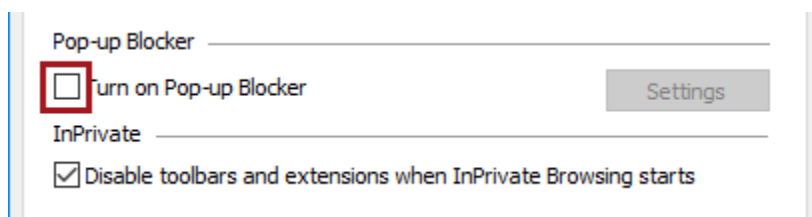
3. At the top-right corner, click the settings icon, and then select **Internet Options**.



4. In the **Internet Options** window, select the **Privacy** tab.

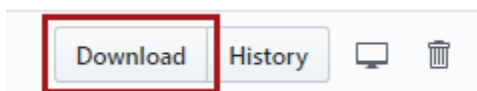


5. Uncheck the **Turn On Pop-up Blocker** checkbox.

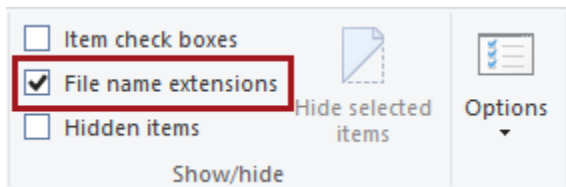


6. Click **OK**.
7. Maximize the Internet Explorer window.
8. In the **URL** box, enter <https://aka.ms/edx-dat225x-lab-content>.
Tip: You can copy-and-paste the URL into the Remote Desktop window.
9. On the web page, click the **DAT225x-Analysis-Services-Tabular.zip** link.

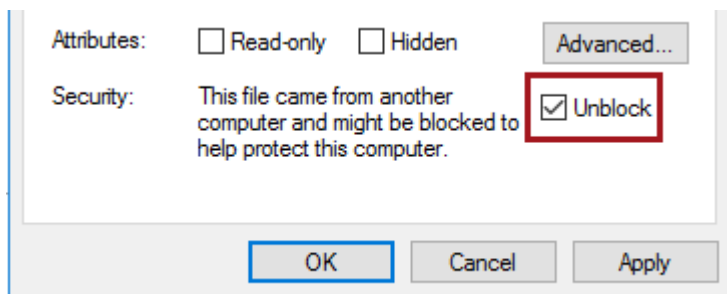
10. To download the lab resources, click **Download**.



11. Download the file (**Save As**) to **F:**.
12. In the File Explorer window, navigate to **F:**.
13. On the **View** ribbon, check **File Name Extensions**.

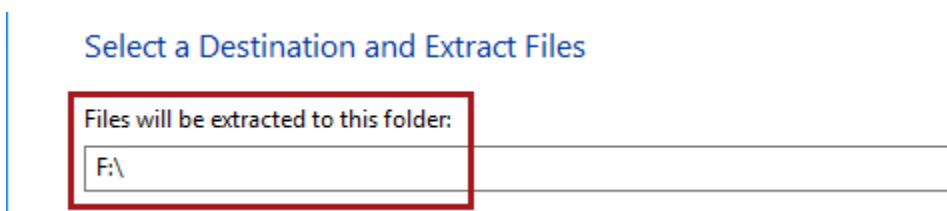


14. Right-click the **DAT225x-Analysis-Services-Tabular.zip** file, and then select **Properties**.
15. In the window, check **Unblock**.



16. Click **OK**.
17. To extract the file content, right-click the **DAT225x-Analysis-Services-Tabular.zip** file, and then select **Extract All**.
18. In the window, replace the folder path with **F:**.

*Be sure to extract the files to **F:**, otherwise later steps in this lab will fail.*



19. Click **Extract**.
20. Optionally, delete the **DAT225x-Analysis-Services-Tabular.zip** file.

21. Verify that you have the **F:\Labs** folder.

Installing the Sample Database

In this task, you will run a script to install a sample database and configure database permissions.

1. In File Explorer, navigate to the **F:\Labs\Lab01\Assets** folder.
2. Double-click the **Setup-Database.cmd** file.

*The setup will restore the **AdventureWorksDW2016** database. The database has been modified from the original sample for the purposes of this course.*

3. When the script execution completes, press any key to close the console window.

Installing the Model

In this task, you will run a script to install the model preview.

1. In the **F:\Labs\Lab01\Assets** folder, right-click the **Setup-Model.ps1** file, and then select **Run with PowerShell**.
2. If prompted to change the execution policy, enter **Y**, and then press **Enter**.

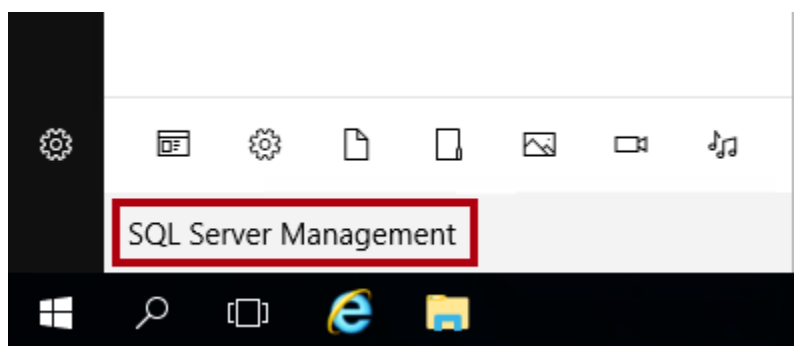
*The setup will restore the **Reseller Sales** database. The database represents the final solution produced by the lab, and you will preview the cube in this lab.*

3. When the script execution completes, press any key to close the PowerShell window.

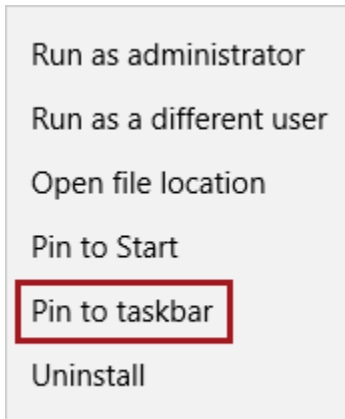
Configuring SQL Server Management Studio

In this task, you will configure SQL Server Management Studio (SSMS). This tool will be required to explore database, and to also execute scripts.

1. To add a shortcut to the taskbar, at the bottom-left corner, click the **Windows** icon, and then commence typing **SQL Server Management**.



2. In the **Apps** section, when the search result appears, right-click **Microsoft SQL Server Management Studio**, and then select **Pin to Taskbar**.

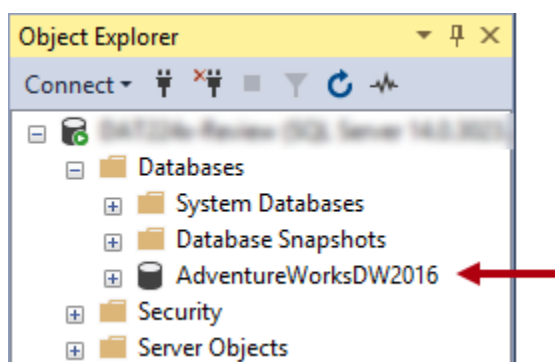


3. Return to the desktop, and then click the **SQL Server Management Studio** shortcut.



It may take 1-2 minutes for SSMS to setup.

4. In the **Connect to Server** window, click **Connect**.
5. To verify that the **AdventureWorksDW2016** database was restored, in **Object Explorer** (located at the left), expand the **Databases** folder.
6. Verify that the **AdventureWorksDW2016** database is listed.



7. To close SQL Server Management Studio, on the **File** menu, select **Exit**.

You may receive a popup notification from SSMS that a later version is available for download. There is no need to install a later version to complete the labs.

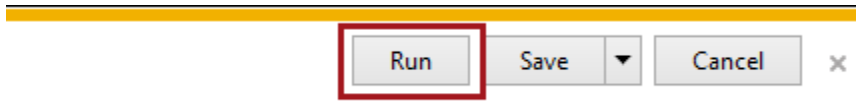
Installing SQL Server Data Tools

In this task, you will install SQL Server Data Tools (SSDT). This tool is required to develop an Analysis Services Multidimensional project.

8. In Internet Explorer, navigate to <https://aka.ms/edx-dat225x-ssdt>.

Tip: You can copy-and-paste the URL into the Remote Desktop window.

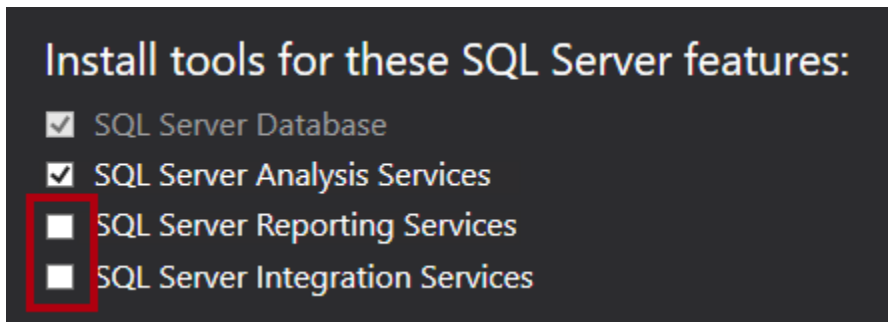
9. When prompted by Internet Explorer to run the **SSDT-Setup-ENU.exe** file, click **Run**.



10. In the Microsoft SQL Server Data Tools window, if you accept the license terms and privacy statement, click **Next**.



11. Uncheck the **SQL Server Reporting Services** and **SQL Server Integration Services** checkboxes.

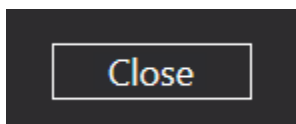


12. Click **Install**.



The installation usually takes 10-15 minutes to complete.

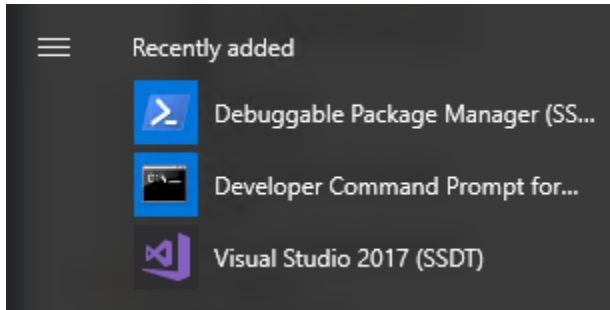
13. When the installation completes, click **Close**.



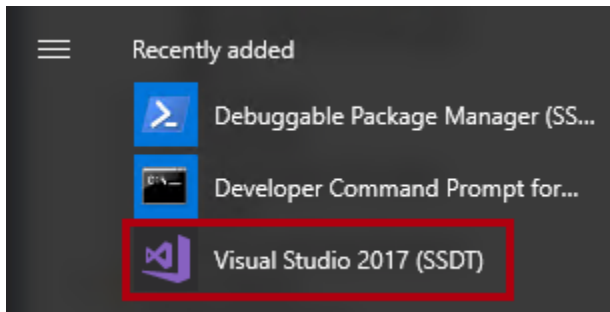
Configuring SQL Server Data Tools

In this task, you will configure SSDT.

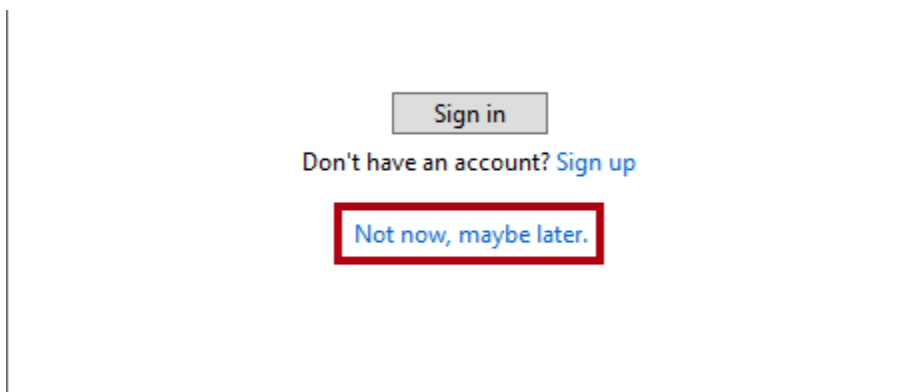
1. To launch SSDT, at the bottom-left corner, click the **Windows** icon, and notice the items in the **Recently Added** section.



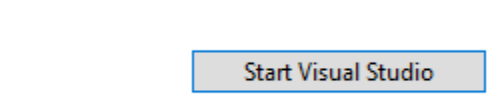
2. Select **Visual Studio 2017 (SSDT)**.



3. In the Visual Studio welcome window, to avoid signing in, click the **Not Now, Maybe Later** link.

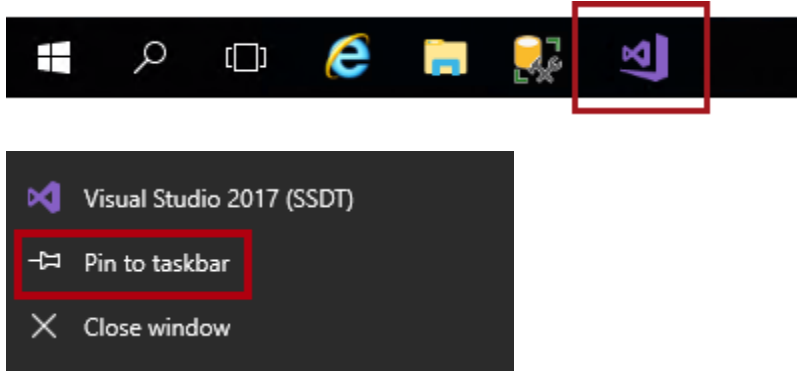


4. Click **Start Visual Studio**.

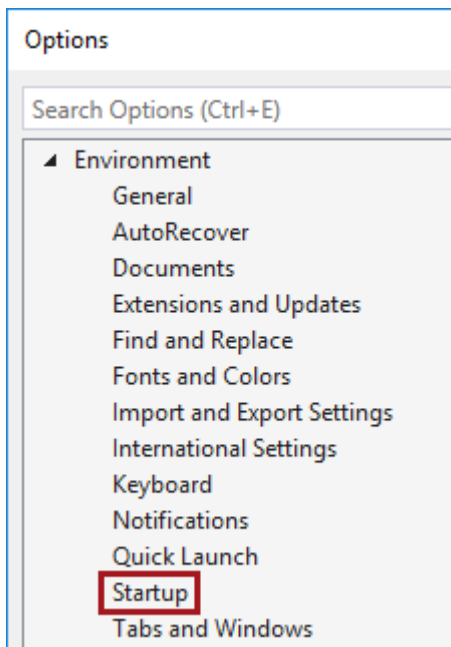


It may take 1-2 minutes for SSDT to setup.

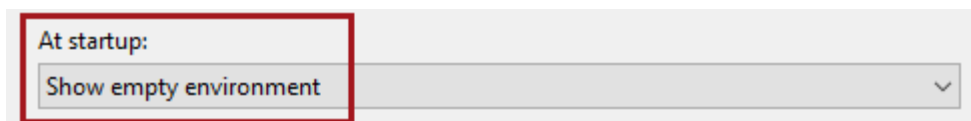
- To create a shortcut, on the taskbar, right-click the **Visual Studio 2017** icon, and then select **Pin to Taskbar**.



- To configure the SSDT environment, on the **Tools** menu, select **Options**.
- In the **Options** window, in the left pane, select the **Startup** page.



- In the **At Startup** dropdown list, select **Show Empty Environment**.



- Click **OK**.
- To close SSDT, on the **File** menu, select **Exit**.

*You will work with SSDT to create an Analysis Services Tabular Project in **Lab 02**.*

Installing Microsoft Office

In this task, you will install Microsoft Office. This tool is required to create PivotTable reports to help test the design of your Analysis Services multidimensional model.

1. In Internet Explorer, navigate to <http://aka.ms/dat225x-xls>.

Tip: You can copy-and-paste the URL into the Remote Desktop window.

2. When prompted by Internet Explorer to run the setup file, click **Run**.

The installation usually takes 10-15 minutes to complete.

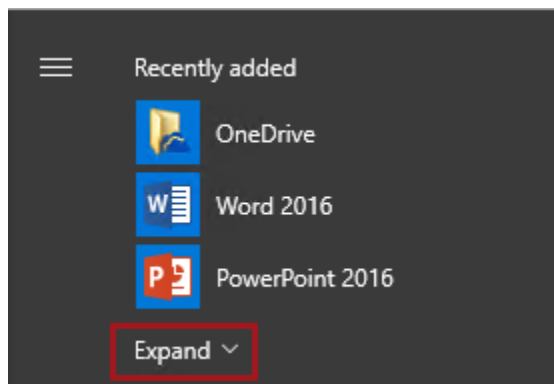
3. When the installation completes, click **Close**.

You're all set! Office is installed now

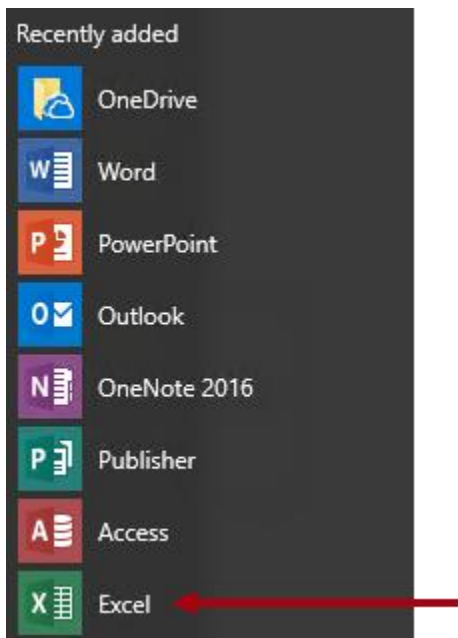
Click Start to view your apps.



4. To launch Excel, at the bottom-left corner, click the **Windows** icon, and expand the items in the **Recently Added** section.



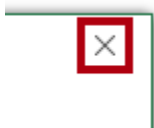
5. Select **Excel**.



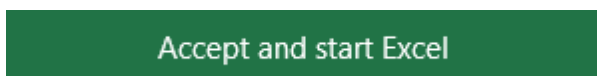
6. When Excel launches, in the sign in window, at the bottom of the window, click the **I Don't Want to Sign In or Create an Account** link.



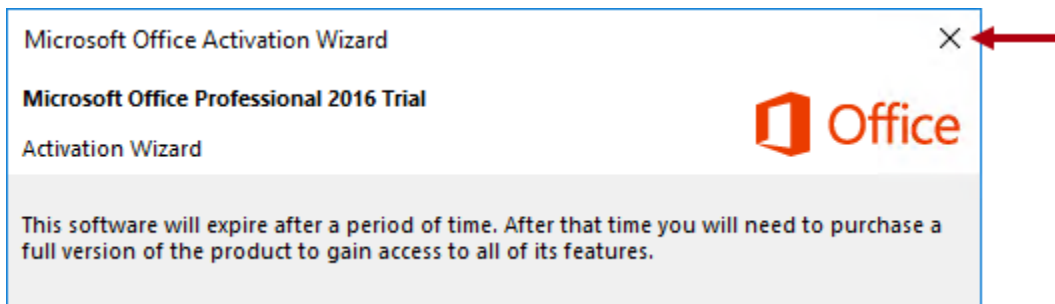
7. When prompted to enter your product key, at the top-right corner, click **X** to close the window.



8. If you accept the license agreement, click **Accept and Start Excel**.



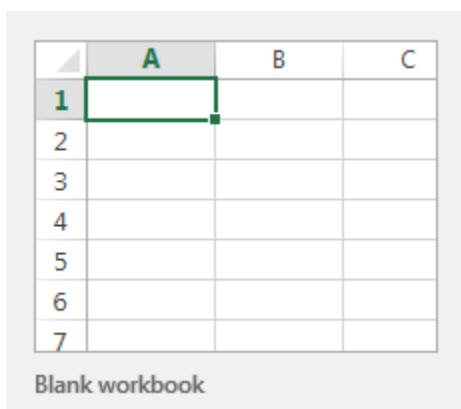
9. To close the **Activate Office** window, click **X**.



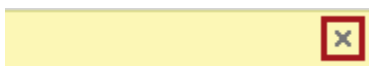
A trial period is available for up to 30 days, during which you will have ample time to complete the labs for this course. Once the trial period expires, you will have the option to purchase an Office 365 subscription.

In the labs, each time you launch Excel, be sure to use this technique to cancel the Activation Wizard.

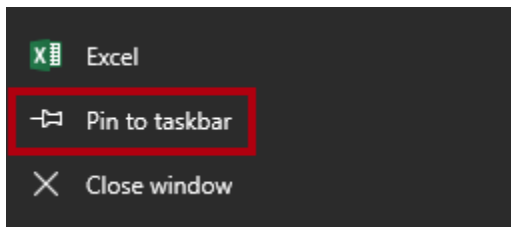
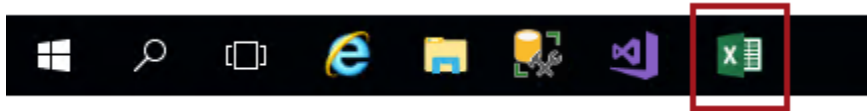
10. To create a blank workbook, select the **Blank Workbook** template.



11. Notice the yellow warning banner.
12. To hide the banner, at the far right, click **X**.



13. To create a shortcut, on the taskbar, right-click the **Excel** icon, and then select **Pin to Taskbar**.



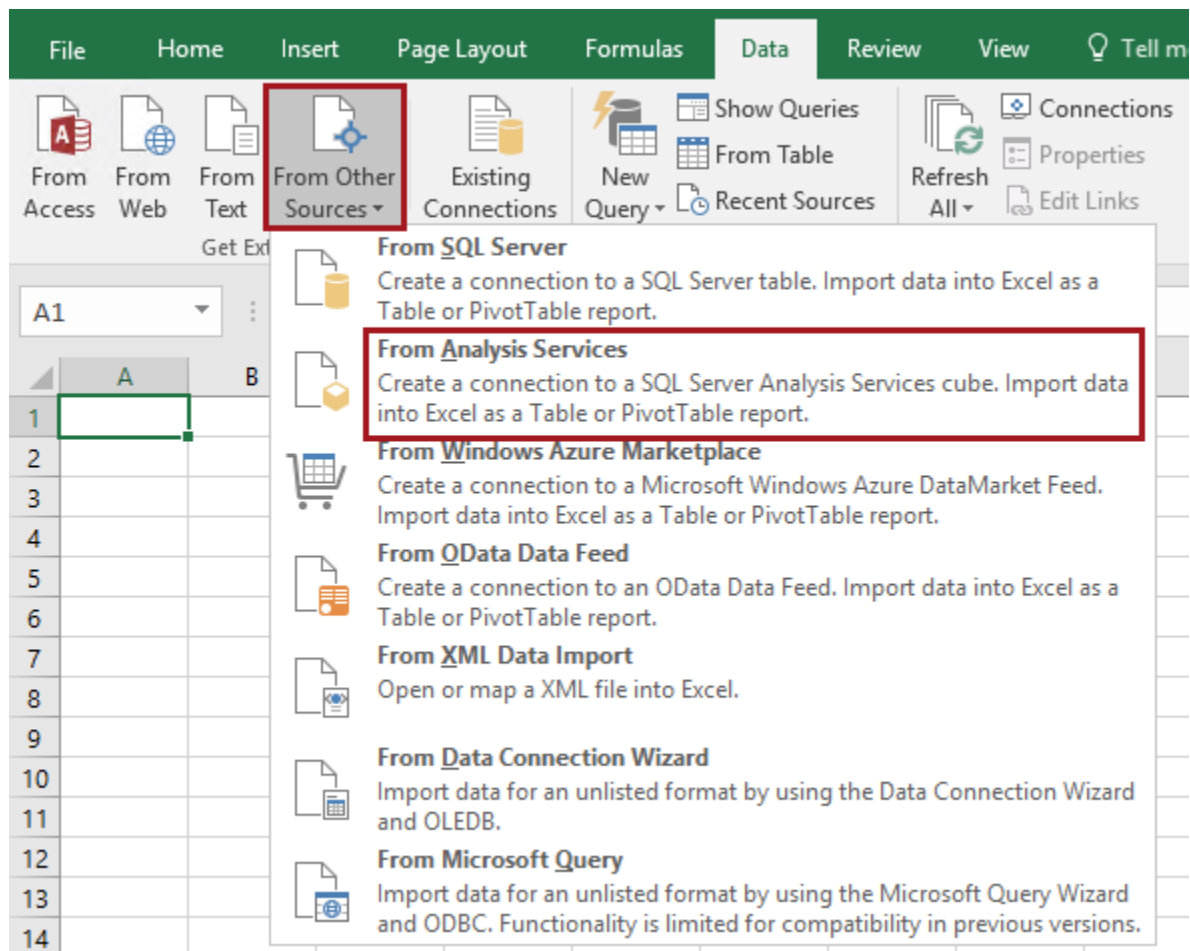
Exercise 3: Exploring the Lab Solution

In this exercise, you will explore the lab solution by connecting to the data model in Excel, and creating a PivotTable report.

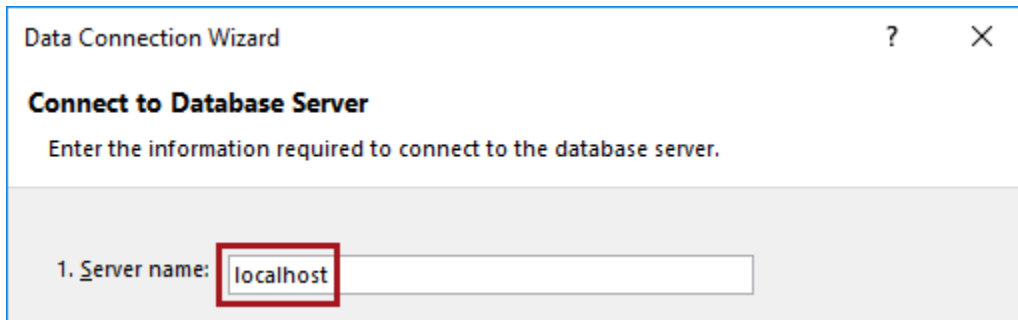
Exploring the Lab Solution

In this task, you will explore the lab solution by connecting to the data model in Excel, and creating a PivotTable report.

1. In Excel, on the **Data** ribbon, in the **Get External Data** group, click **From Other Sources**, and then select **From Analysis Services**.

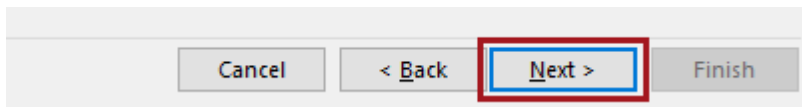


2. In the **Data Connection Wizard** window, in the **Server Name** box, enter **localhost**.



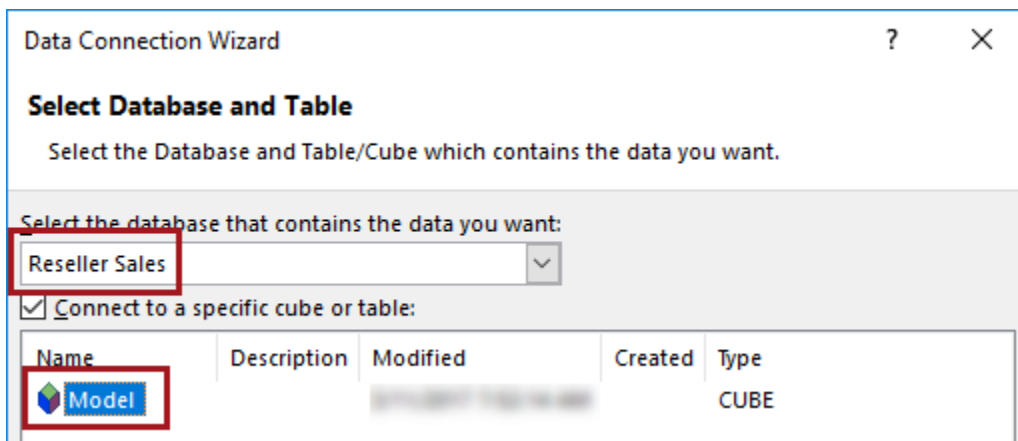
The screenshot shows the 'Data Connection Wizard' window with the title 'Connect to Database Server'. Below the title, it says 'Enter the information required to connect to the database server.' There is a text box labeled '1. Server name:' with the value 'localhost' entered. The text box is highlighted with a red rectangle.

3. Click **Next**.



The screenshot shows the navigation buttons at the bottom of the wizard: 'Cancel', '< Back', 'Next >', and 'Finish'. The 'Next >' button is highlighted with a red rectangle.

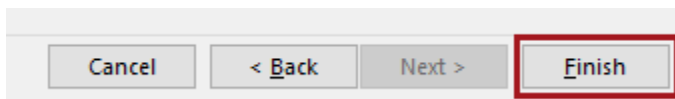
4. At the **Select Database and Table** step, in the dropdown list, notice that the **Reseller Sales** database is selected, as is the model named **Model**.



The screenshot shows the 'Data Connection Wizard' window with the title 'Select Database and Table'. Below the title, it says 'Select the Database and Table/Cube which contains the data you want.' There is a dropdown menu labeled 'Select the database that contains the data you want:' with 'Reseller Sales' selected. Below this, there is a checkbox labeled 'Connect to a specific cube or table:' which is checked. Below the checkbox is a table with columns: Name, Description, Modified, Created, and Type. The table contains one row with the name 'Model' and type 'CUBE'. The 'Model' entry in the Name column is highlighted with a red rectangle.

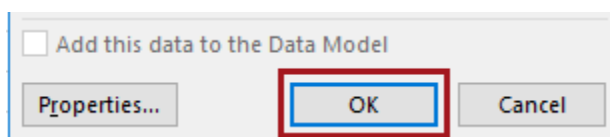
Name	Description	Modified	Created	Type
Model				CUBE

5. Click **Next**.
6. At the **Save Data Connection File and Finish** step, to connect to the model, click **Finish**.



The screenshot shows the navigation buttons at the bottom of the wizard: 'Cancel', '< Back', 'Next >', and 'Finish'. The 'Finish' button is highlighted with a red rectangle.

7. In the **Import Data** window, notice that the **PivotTable Report** option is selected, and then click **OK**.

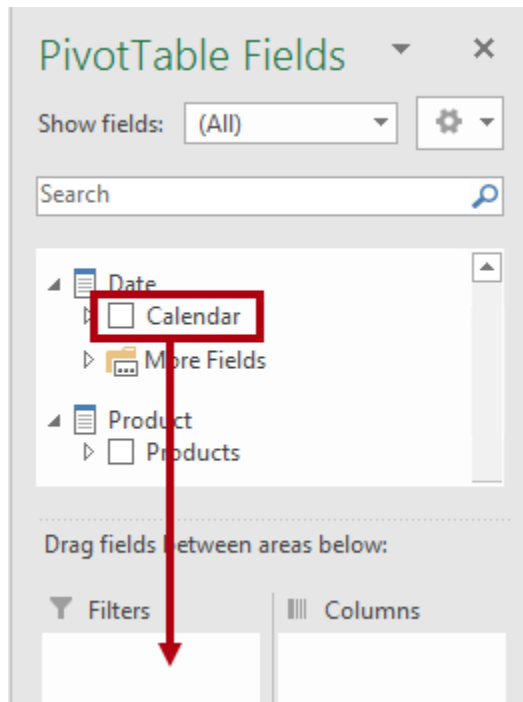


The screenshot shows the 'Import Data' window. It has a checkbox labeled 'Add this data to the Data Model' which is unchecked. Below the checkbox are three buttons: 'Properties...', 'OK', and 'Cancel'. The 'OK' button is highlighted with a red rectangle.

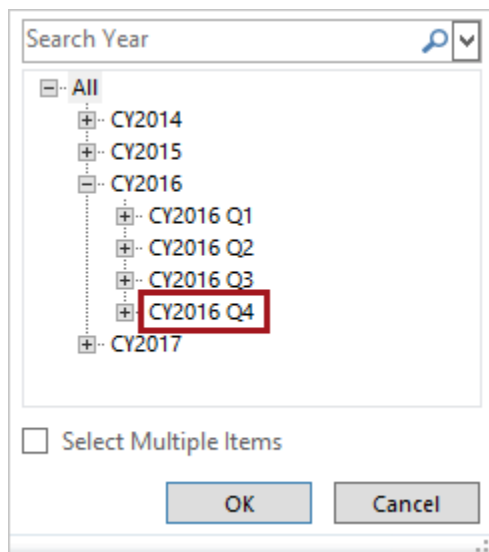
8. Notice the **PivotTable Fields** pane at the right.

This pane surfaces the interface of the model.

9. In the **PivotTable Fields** pane, scroll down to locate the **Date** table.
10. From inside the **Date** table, drag the **Calendar** hierarchy to the **Filters** drop zone.



11. In the **Calendar** PivotTable filter (cell **B1**), click the down-arrow, expand the **All | CY2016** members, and then select the **CY2016 Q4** member.



12. Click **OK**.

- In the **PivotTable Fields** pane, from inside the **Salesperson** table, check the **Salespeople** hierarchy to add it to the **Rows** drop zone.



- In the **PivotTable Fields** pane, in this order, select the following fields.

Table	Field
Sales	Sales
Target	Target
Target	Variance
Target	Variance%
Sales	Profit%
Sales	Distinct Products

- Verify that the PivotTable report looks like the following.

	A	B	C	D	E	F	G
1	Calendar	CY2016 Q4					
2							
3	Row Labels	Sales	Target	Variance	Variance%	Profit%	Distinct Products
4	Europe	\$2,300,279.97	\$2,425,000.00	(\$124,720.03)	-5.14 %	0.36 %	147
5	NA	\$200,894.23	\$170,000.00	\$30,894.23	18.17 %	1.19 %	101
6	North America	\$6,051,229.01	\$5,900,000.00	\$151,229.01	2.56 %	-0.70 %	149
7	Pacific	\$385,157.65		\$385,157.65		-1.19 %	91
8	Grand Total	\$8,937,560.86	\$8,495,000.00	\$442,560.86	5.21 %	-0.40 %	149

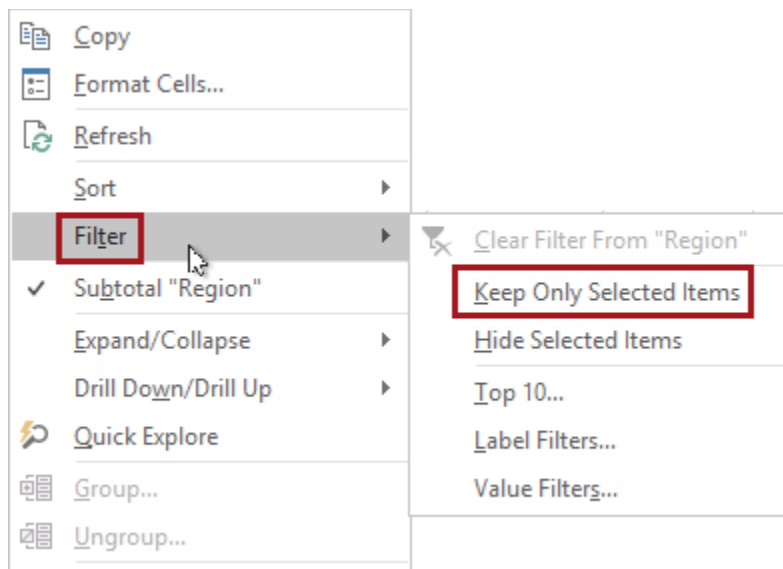
- In cell **A6**, expand the **North America** member to reveal the countries.

	A	B	C	D	E	F	G
1	Calendar	CY2016 Q4					
2							
3	Row Labels	Sales	Target	Variance	Variance%	Profit%	Distinct Products
4	Europe	\$2,300,279.97	\$2,425,000.00	(\$124,720.03)	-5.14 %	0.36 %	147
5	NA	\$200,894.23	\$170,000.00	\$30,894.23	18.17 %	1.19 %	101
6	North America						
7	Canada	\$1,058,864.46	\$1,000,000.00	\$58,864.46	5.89 %	-1.04 %	149
8	United States	\$4,992,364.54	\$4,900,000.00	\$92,364.54	1.88 %	-0.63 %	148
9	Pacific	\$385,157.65		\$385,157.65		-1.19 %	91
10	Grand Total	\$8,937,560.86	\$8,495,000.00	\$442,560.86	5.21 %	-0.40 %	149

- In cell **A8**, expand the **United States** member to reveal the regions.

	A	B	C	D	E	F	G
1	Calendar	CY2016 Q4					
2							
3	Row Labels	Sales	Target	Variance	Variance%	Profit%	Distinct Products
4	⊕ Europe	\$2,300,279.97	\$2,425,000.00	(\$124,720.03)	-5.14 %	0.36 %	147
5	⊕ NA	\$200,894.23	\$170,000.00	\$30,894.23	18.17 %	1.19 %	101
6	⊖ North America						
7	⊕ Canada	\$1,058,864.46	\$1,000,000.00	\$58,864.46	5.89 %	-1.04 %	149
8	⊖ United States						
9	⊕ Central	\$762,002.76	\$800,000.00	(\$37,997.24)	-4.75 %	-0.50 %	142
10	⊕ Northeast	\$809,121.84	\$750,000.00	\$59,121.84	7.88 %	-0.48 %	135
11	⊕ Northwest	\$1,193,395.54	\$1,350,000.00	(\$156,604.46)	-11.60 %	-0.29 %	145
12	⊕ Southeast	\$605,254.60	\$600,000.00	\$5,254.60	0.88 %	-0.14 %	141
13	⊕ Southwest	\$1,622,589.81	\$1,400,000.00	\$222,589.81	15.90 %	-1.18 %	146
14	⊕ Pacific	\$385,157.65		\$385,157.65		-1.19 %	91
15	Grand Total	\$8,937,560.86	\$8,495,000.00	\$442,560.86	5.21 %	-0.40 %	149

- To focus on one region, in cell **A11**, right-click the **Northwest** member, and then select **Filter | Keep Only Selected Items**.



	A	B	C	D	E	F	G
1	Calendar	CY2016 Q4					
2							
3	Row Labels	Sales	Target	Variance	Variance%	Profit%	Distinct Products
4	⊖ North America						
5	⊖ United States						
6	⊕ Northwest	\$1,193,395.54	\$1,350,000.00	(\$156,604.46)	-11.60 %	-0.29 %	145
7	Grand Total	\$1,193,395.54	\$1,350,000.00	(\$156,604.46)	-11.60 %	-0.29 %	145

- In cell A6, expand the **Northwest** region.
- Verify that the PivotTable report now displays salespeople within the **Northwest** region.

	A	B	C	D	E	F	G
1	Calendar	CY2016 Q4					
2							
3	Row Labels	Sales	Target	Variance	Variance%	Profit%	Distinct Products
4	North America						
5	United States						
6	Northwest						
7	David Campbell	\$380,814.59	\$300,000.00	\$80,814.59	26.94 %	1.28 %	131
8	Pamela Ansman-Wolfe	\$362,722.07	\$600,000.00	(\$237,277.93)	-39.55 %	1.63 %	105
9	Tete Mensa-Annan	\$449,858.88	\$450,000.00	(\$141.12)	-0.03 %	-3.16 %	124
10	Grand Total	\$1,193,395.54	\$1,350,000.00	(\$156,604.46)	-11.60 %	-0.29 %	145

- In cell B1, filter by **CY2016 Q3**.

Lab Check

Lab 01 ► Exploring the Lab Solution

What exact sales amount was achieved by salesperson **Pamela Ansman-Wolfe** in **CY2016 Q3**?

How many distinct products did **Tete Mensa-Annan** sell in **CY2016 Q3**?

You may need data from this step to answer a Lab-based Knowledge Check associated with this module.

At this time, we recommend that you open the **Module 1 Lab-based Knowledge Check** portion of the course in EdX to answer the questions as you complete this lab.

- To close Excel, at the top-right corner, click **X**.



You have now completed the lab. In the next lab you will commence the development of a Tabular Project.

*If you are not immediately continuing with the next lab, you should complete the **Finishing Up** exercise to shut down and stop the VM.*

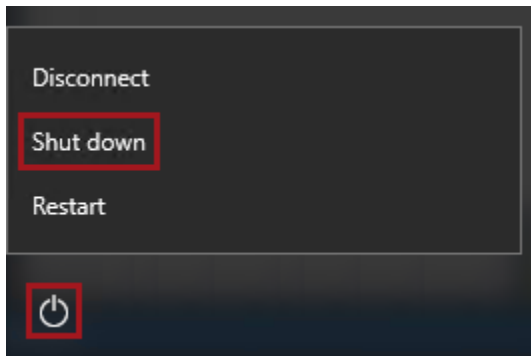
Finishing Up

In this exercise, you will shut down and stop the VM.

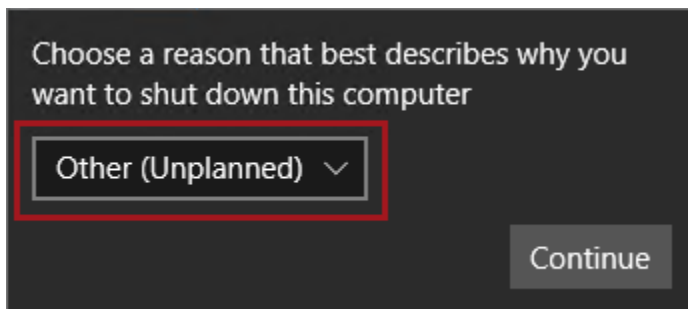
Finishing Up

In this task, you will shut down and stop the VM.

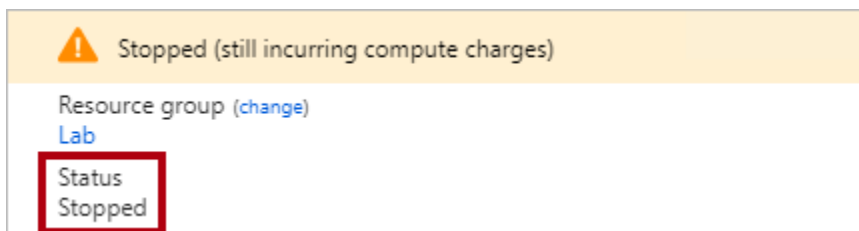
1. Close all open applications.
2. Press the **Windows** key, and then in the **Start** page, located at the bottom-left, click the **Power** button, and then select **Shut Down**.



3. When prompted to choose a reason, to accept the default.



4. Click **Continue**.
5. In the **Azure Portal** Web browser page, wait until the status of the VM updates to **Stopped**.



In this state, however, the VM is still billable.

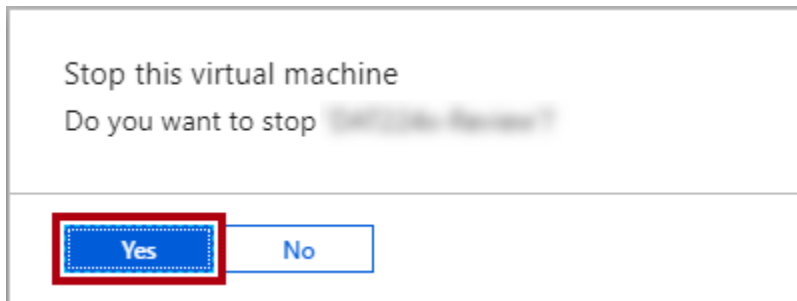
- Optionally, to deallocate the VM, click **Stop**.

Deallocation will take some minutes to complete, and also extends the time required to restart the VM. Consider deallocating the VM if you want to reduce costs, or if you choose to complete the next lab after an extended period.

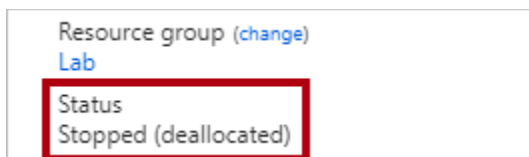


The deallocation can take several minutes to complete.

- When prompted to stop the virtual machine, click **Yes**.



- Verify that the VM status updates to **Stopped (Deallocated)**.



In this state, the VM is now not billable—except for a relatively smaller storage cost.

Note that a deallocated VM will likely acquire a different IP address the next time it is started.

- Sign out of the **Azure Portal**.