



DSD631

Instructions:

- Recall keeping a copy of all submitted assignments.
- All work must be typed using Microsoft Word and convert the word document to PDF before uploading to COLCampus.
- Kindly note that you will be evaluated on your writing skills in all your assignments.
- Negative marking will be applied if you are found guilty of plagiarism, poor writing skills or if you have applied incorrect or insufficient referencing.
- Each assignment must include a cover page, table of contents and full bibliography, based on Harvard referencing style.
- Students are not allowed to offer their work for sale or to purchase the work of other students. This includes the use of professional assignment writers. If this should happen, CTU training Solutions reserves the right not to accept future submissions from a student.

Spelling, style, fonts, font size, line spacing

- Please copy the questions onto your answer sheet (single space the questions), and make sure to use numbers to indicate the answers to each question.
- Always use a spell checker before you submit assignments! We reserve the right to deduct point for each obvious misspelling.
- Always double-space your answers.
- Please use Arial (or Calibri (Body)), 12 points as the font for your assignments. Certain fonts have been known not to come across in the PDF files.
- Use only black or blue font face colors. Do not use red!

Question 1**150 MARKS**

Using the Azure Portal and SQL Server Management Studio

Assessment Overview

Students will explore the Azure Portal and use it to create an Azure VM with SQL Server 2019 installed. Then they will connect to the virtual machine through Remote Desktop Protocol and restore a database using SQL Server Management Studio.

Assessment Goal

The student will be able to interact with the Azure portal to create a SQL Server Virtual Machine. They should then be able to connect to the virtual machine and use SQL Server Management Studio to restore a database.

Assessment Objectives

The students will:

- Interact with the Azure portal
- Create a SQL Server Virtual Machine-
- Use SQL Server Management Studio to restore a database

Scenario

You are a database administrator for Adventure Works South Africa. You need to create a test environment for use in a proof of concept. The proof of concept will use SQL Server on an Azure Virtual Machine and a backup of the [AdventureWorksDW](#) database. Use the provided link to download the adventure works database.

Very Important

1. ***Do not screenshot the code of the program, only the output of the program will need to be screenshots. The program & the database CODES should be copied and pasted on the word document with explanations before converting the document to pdf.***

[10 Marks]

2. Use MS PowerPoint screen Recorder to record a 5 minutes video that showcases how the Stock Management System is functioning.

[10 Marks]

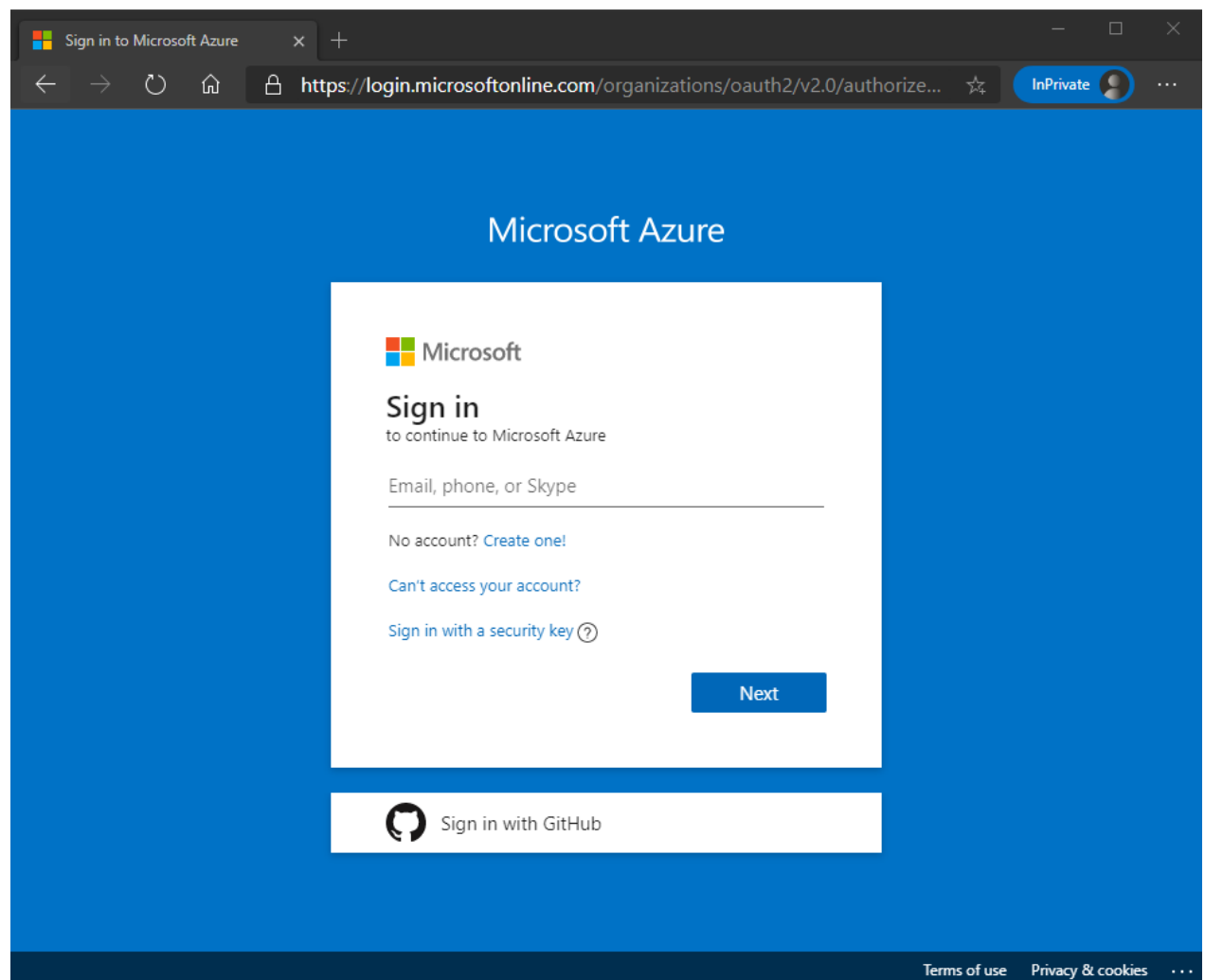
Question 1.1: Provision a SQL Server on an Azure Virtual Machine**[70 Marks]**

The main tasks for this exercise are as follows:

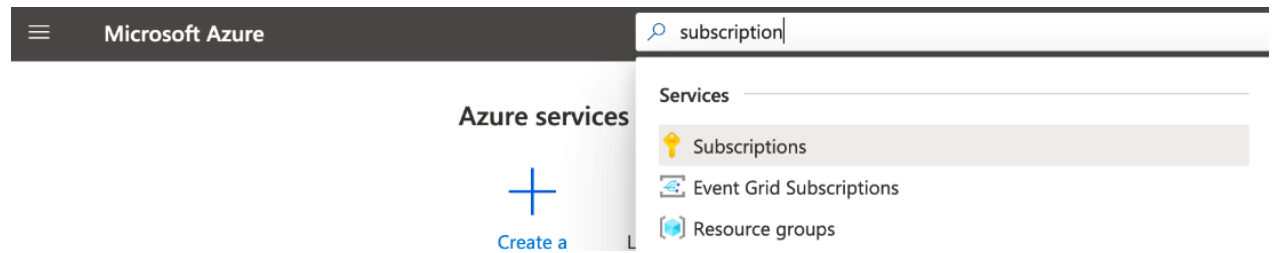
1. Explore the Azure Portal and locate important functionality.
2. Create a SQL Server on an Azure Virtual Machine using the Azure Portal.

Task 1: Explore the Azure Portal

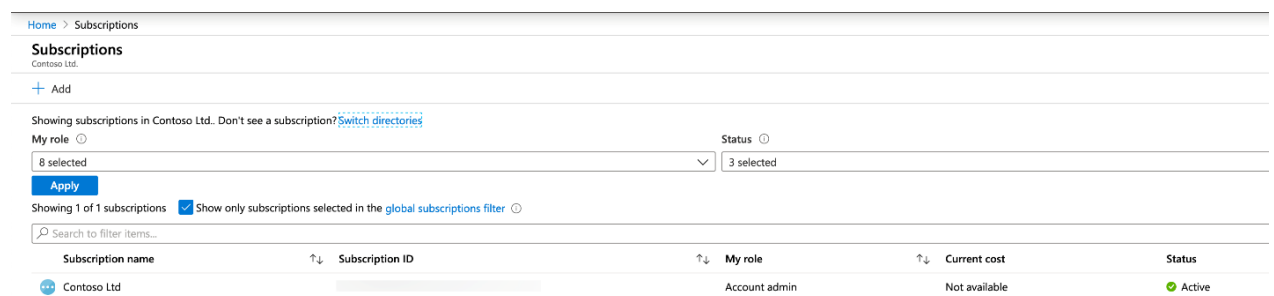
1. From the lab virtual machine, if you are not already in the portal, start a browser session and navigate to <https://portal.azure.com>.



2. In the Azure Portal, type subscription in the search bar at the top of the screen. Click on the subscriptions icon. (You may need to log in first.)

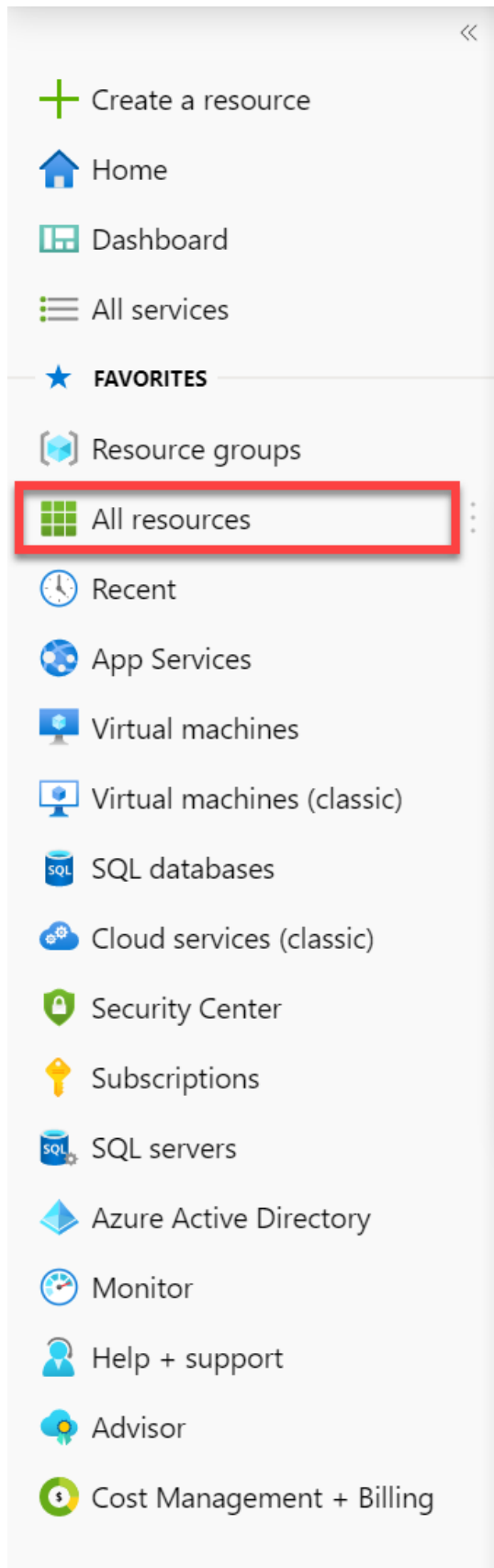


- On the Subscriptions blade, you will have one or more subscriptions. Review your Subscription name, subscription ID, and your role.

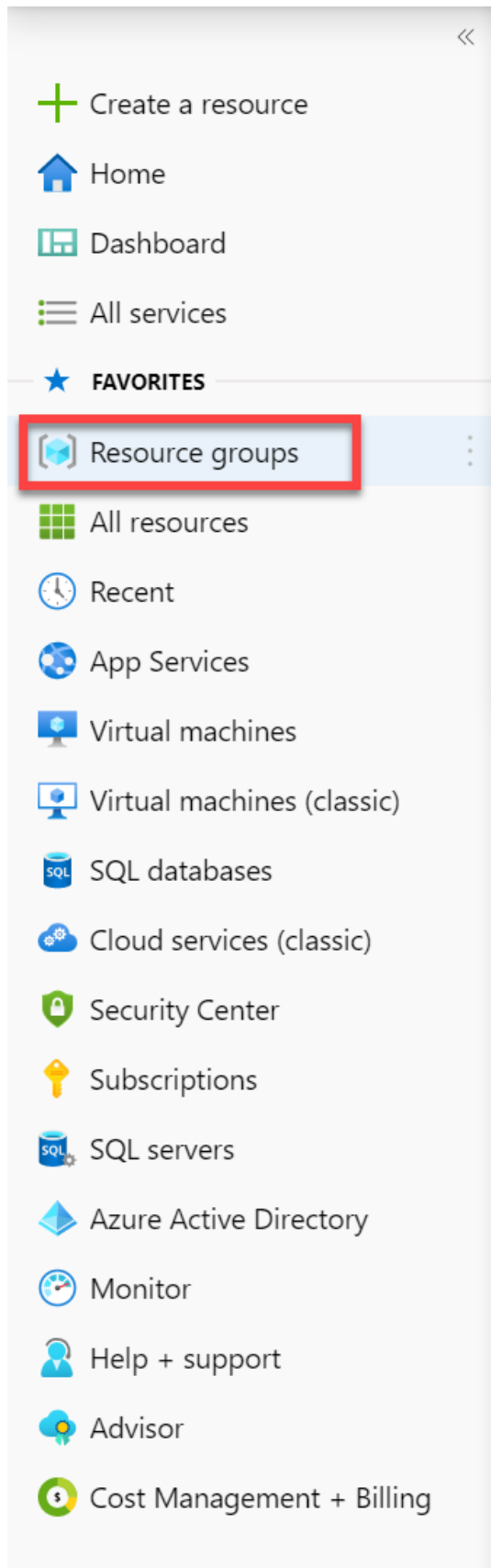


- Launch the left navigation pane by clicking the horizontal lines next to Microsoft Azure in the top left of the portal. Then select All resources.



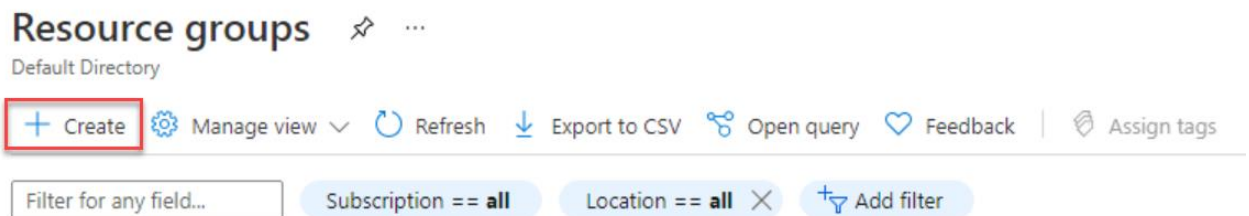


5. The All-resources page will list all Azure resources within your selected subscriptions.
6. Select Resource groups in the left navigation.



The Resource groups blade will list all Azure resource groups within your selected subscriptions.


7. On the Resource groups blade, select the Create button.



8. Ensure you have selected the appropriate subscription for the lab. Name the resource group DP-300-Lab01. Select the nearest Azure region to your location. Select the Review + Create button. Once the review completes, select the Create button.

Create a resource group ...


Basics Tags Review + create

Resource group - A container that holds related resources for an Azure solution. The resource group can include all the resources for the solution, or only those resources that you want to manage as a group. You decide how you want to allocate resources to resource groups based on what makes the most sense for your organization. [Learn more](#) 

Project details

Subscription * ⓘ

Resource group * ⓘ

DP-300-Lab01 

Resource details

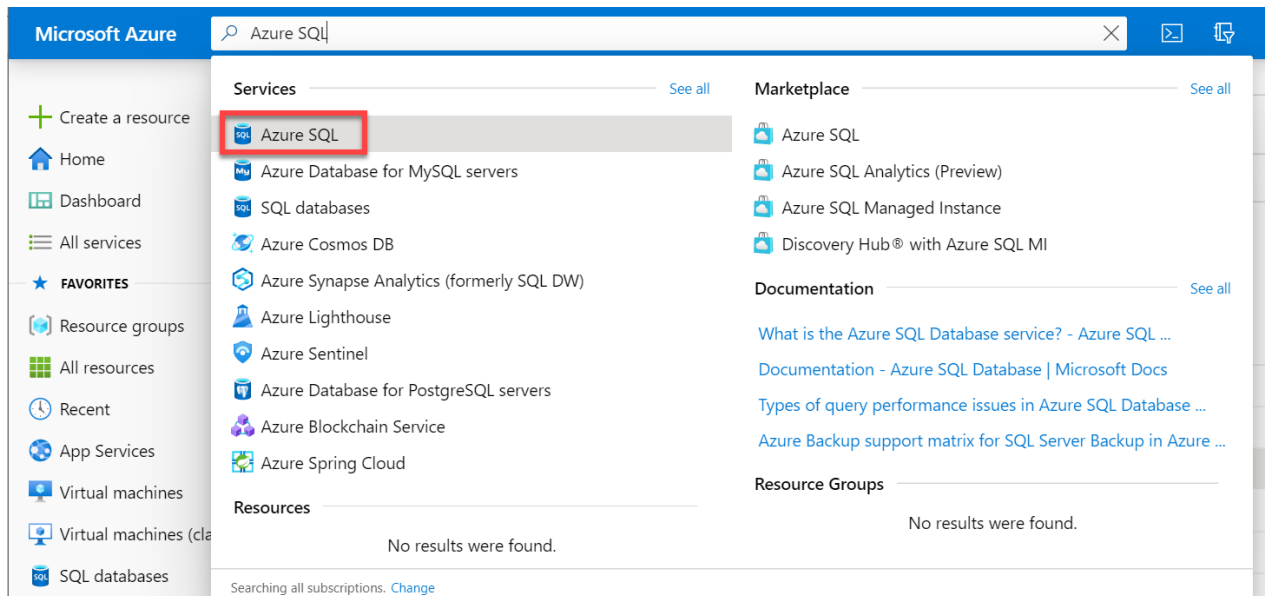
Region * ⓘ

[Review + create](#)

[< Previous](#)

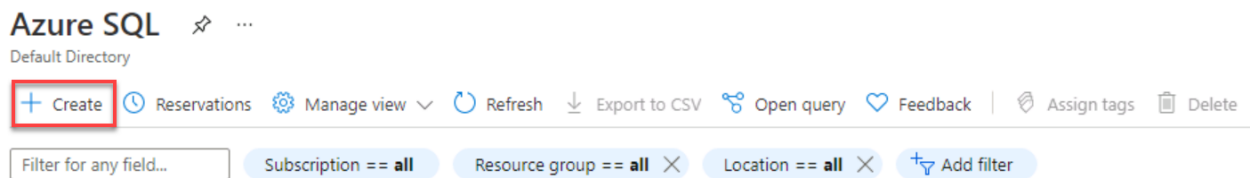
[Next : Tags >](#)

9. Locate the search bar at the top of the page. Search for Azure SQL. Select the search result for Azure SQL that appears in the results under Services.



Task 2: Provision a SQL Server on an Azure Virtual Machine

1. On the Azure SQL blade, select the Create button.



2. On the Select SQL deployment option blade, open the drop-down box under SQL virtual machines. Select the option labeled Free SQL Server License: SQL 2019 Developer on Windows Server 2019. Then select the Create button.

Select SQL deployment option

Microsoft

Feedback

How do you plan to use the service?

SQL databases

Best for modern cloud applications. Hyperscale and serverless options are available.

Resource type

Single database

Create Show details

SQL managed instances

Best for most migrations to the cloud. Lift-and-shift ready.

Resource type

Single instance

Create

Please select an offer

SQL Server 2019 on Windows Server 2019

Free SQL Server License: SQL 2019 Developer on Windows Server 2019

SQL Server 2019 Enterprise Windows Server 2019

SQL Server 2019 Standard on Windows Server 2019

(BYOL) SQL Server 2019 on Windows Server 2019

(BYOL) SQL Server 2019 Enterprise Windows Server 2019

(BYOL) SQL Server 2019 Standard on Windows Server 2019

SQL Server 2019 on RHEL74

Free SQL Server License: SQL Server 2019 Developer on Red Hat Enterprise Linux 7.4

SQL Server 2019 Enterprise on Red Hat Enterprise Linux 7.4

SQL Server 2019 Standard on Red Hat Enterprise Linux 7.4

SQL virtual machines

Best for migrations and applications requiring OS-level access. Lift-and-shift ready.

Image

- On the Create a virtual machine blade, enter the following information:
 - Subscription: **<Your subscription>**
 - Resource group: **DP-300-Lab01**
 - Virtual machine name: **dp300sqlvmlab01**
 - Region: **<your local region, same as the selected region for your resource group>**
 - Availability Options: **No infrastructure redundancy required**
 - Image: **Free SQL Server License: SQL 2019 Developer on Windows Server 2019 - Gen1**
 - Azure spot instance: **No**
 - Size: Standard **D2s_v3** (2 vCPUs, 8 GiB memory; you may need to select the "See all sizes" link to see this option)
 - Administrator account username: **dp300sqlvmlab01admin**
 - Administrator account password: **pwd!DP300lab01** (or your own password that meets the criteria)
 - Select inbound ports: **RDP (3389)**
 - Would you like to use an existing Windows Server license?: **No**

Make note of the username and password for later use.

[Home](#) > [Select SQL deployment option](#) > Create a virtual machine

Create a virtual machine

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * ⓘ

Microsoft Azure Sponsorship



Resource group * ⓘ

DP-300-Lab01

[Create new](#)

Instance details

Virtual machine name * ⓘ

dp300sqlvmlab01

Region * ⓘ

(US) West US 2

Availability options ⓘ

No infrastructure redundancy required

Image * ⓘ

Free SQL Server License: SQL 2019 Developer on Windows Server 2019

[Browse all public and private images](#)

Azure Spot instance ⓘ

☐ Yes ☒ No

Size * ⓘ

Standard D2s v3

2 vcpus, 8 GiB memory (\$137.24/month)

[Change size](#)

Administrator account

Username * ⓘ

dp300sqlvmlab01admin

Password * ⓘ

.....

- Navigate to the Disks tab and review the configuration.

[Home](#) > [Select SQL deployment option](#) > Create a virtual machine

Create a virtual machine

Basics

Disks

Networking

Management

Advanced

SQL Server settings

Tags

Review + create

Azure VMs have one operating system disk and a temporary disk for short-term storage. You can attach additional data disks. The size of the VM determines the type of storage you can use and the number of data disks allowed. [Learn more](#)

Disk options

OS disk type * ⓘ

Premium SSD

Encryption type *

(Default) Encryption at-rest with a platform-managed key

▼ Advanced

5. Navigate to the Networking tab and review the configuration.

Search resources, services, and docs (G+/)

Home > Select SQL deployment option > Create a virtual machine

×

Create a virtual machine

Basics

Disks

Networking

Management

Advanced

SQL Server settings

Tags

Review + create

Define network connectivity for your virtual machine by configuring network interface card (NIC) settings. You can control ports, inbound and outbound connectivity with security group rules, or place behind an existing load balancing solution.

[Learn more](#)

Network interface

When creating a virtual machine, a network interface will be created for you.

Virtual network *

(new) DP-300-Lab01-vnet

▼

Create new

Subnet *

(new) default (10.0.0.0/24)

▼

Public IP

(new) dp300sqlvmlab01-ip

▼

Create new

NIC network security group

☐ None ☒ Basic ☐ Advanced


Public inbound ports *

☐ None ☒ Allow selected ports

Select inbound ports *

RDP (3389)

▼

 This will allow all IP addresses to access your virtual machine. This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.

Accelerated networking

☐ On ☒ Off

The selected VM size does not support accelerated networking.

Review + create

< Previous

Next : Management >

6. Navigate to the Management tab and review the configuration.

[Home](#) > [Virtual machines](#) >

Create a virtual machine

[Basics](#) [Disks](#) [Networking](#) [Management](#) [Advanced](#) [Tags](#) [Review + create](#)

Configure monitoring and management options for your VM.

Azure Security Center

Azure Security Center provides unified security management and advanced threat protection across hybrid cloud workloads.
[Learn more](#)

✔ Your subscription is protected by Azure Security Center basic plan.

Monitoring

Boot diagnostics ⓘ

- ☒ Enable with managed storage account (recommended)
☐ Enable with custom storage account
☐ Disable

OS guest diagnostics ⓘ

- ☐ On ☒ Off

Identity

System assigned managed identity ⓘ

- ☐ On ☒ Off

Auto-shutdown

Enable auto-shutdown ⓘ

- ☐ On ☒ Off

Make sure that **Boot diagnostics** has the button for **Enable with managed storage account (recommended)** selected. Verify that **Enable auto_shutdown** is off.

7. Navigate to the Advanced tab and review the configuration.

Home > Select SQL deployment option > Create a virtual machine

×

Create a virtual machine

Basics Disks Networking Management **Advanced** SQL Server settings Tags Review + create

Add additional configuration, agents, scripts or applications via virtual machine extensions or cloud-init.

Extensions
Extensions provide post-deployment configuration and automation.
Extensions ⓘ [Select an extension to install](#)

Cloud init
Cloud init is a widely used approach to customize a Linux VM as it boots for the first time. You can use cloud-init to install packages and write files or to configure users and security. [Learn more](#)

ⓘ

 The selected image does not support cloud init.

Host
Azure Dedicated Hosts allow you to provision and manage a physical server within our data centers that are dedicated to your Azure subscription. A dedicated host gives you assurance that only VMs from your subscription are on the host, flexibility to choose VMs from your subscription that will be provisioned on the host, and the control of platform maintenance at the level of the host. [Learn more](#)

Host group ⓘ

No host group found

Proximity placement group
Proximity placement groups allow you to group Azure resources physically closer together in the same region. [Learn more](#)

Proximity placement group ⓘ

No proximity placement groups found

Review + create

< Previous

Next : SQL Server settings >

8. Navigate to the SQL Server settings tab and review the configuration.

Home > Select SQL deployment option > Create a virtual machine

×

Create a virtual machine

Basics

Disks

Networking

Management

Advanced

SQL Server settings

Tags

Review + create

Security & Networking

SQL connectivity * Private (within Virtual Network) ▼

Port * 1433

SQL Authentication

SQL Authentication ⓘ Disable Enable

Azure Key Vault integration ⓘ Disable Enable

Storage configuration

Customize performance, size, and workload type to optimize storage for this virtual machine. For optimal performance, separate drives will be created for data and log storage by default. [Learn more about SQL Server best performance practices.](#)

i
The default storage configuration for SQL virtual machines has changed, now including OLTP optimization and separate drives for data and log storage.

Storage

Storage optimization: Transactional processing

SQL Data: 1024 GiB, 5000 IOPS, 200 MB/s
SQL Log: 1024 GiB, 5000 IOPS, 200 MB/s
SQL TempDb: Use local SSD drive
[Change configuration](#)

SQL Server License

Review + create

< Previous

Next : Tags >

Note—you can also configure the storage for your SQL Server VM on this screen. By default, the SQL Server Azure VM templates create one premium disk with read caching for data, one premium disk without caching for transaction log, and uses the local SSD (D:\ on Windows) for **tempdb**.

DSD631

9. Select the Review + create button. Then select the Create button.

Home > Select SQL deployment option > Create a virtual machine

Create a virtual machine

✓ Validation passed

Basics Disks Networking Management Advanced SQL Server settings Tags **Review + create**

PRODUCT DETAILS

Standard D2s v3
by Microsoft
[Terms of use](#) | [Privacy policy](#)

Subscription credits apply ⓘ
0.1880 USD/hr
[Pricing for other VM sizes](#)

TERMS

By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not provide rights for third-party offerings. See the [Azure Marketplace Terms](#) for additional details.

⚠ You have set RDP port(s) open to the internet. This is only recommended for testing. If you want to change this setting, go back to Basics tab.

Basics

Subscription	Microsoft Azure Sponsorship
Resource group	DP-300-Lab01
Virtual machine name	dp300sqlvmlab01
Region	West US 2
Availability options	No infrastructure redundancy required

Create < Previous Next > [Download a template for automation](#)

10. On the deployment blade, wait until the deployment is complete. The VM will take approximate 5-10 minutes to deploy. Then select the Go to resource button.

Home > CreateVm-microsoftsqlserver.sql2019-ws2019-sqldev-20200508150309 | Overview

CreateVm-microsoftsqlserver.sql2019-ws2019-sqldev-20200508150309 | Overview

Deployment

Search (Ctrl+/) Delete Cancel Redeploy Refresh

Overview

- Inputs
- Outputs
- Template

✓ Your deployment is complete

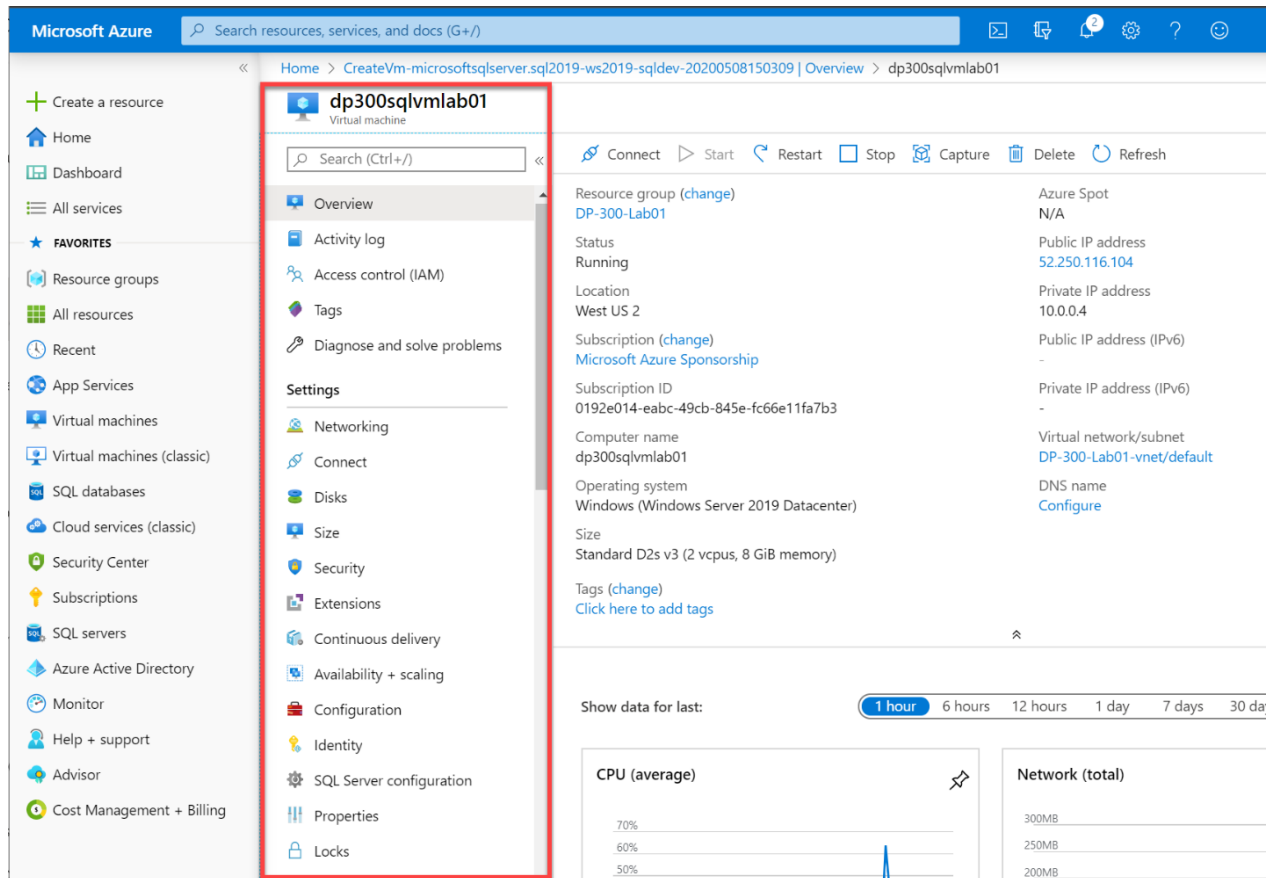
Deployment name: CreateVm-microsoftsqlserver.sql2019-ws2019-... Start time: 5/8/2020, 4:09:25 PM
Subscription: Microsoft Azure Sponsorship Correlation ID: e13b9524-7c7a-4b2c-aff3-5c4d2b94eb28
Resource group: DP-300-Lab01

Deployment details (Download)

Next steps

Go to resource

- On the overview page for the virtual machine, scroll through the menu options for the resource to review what is available.



Question 1.2: Connect to SQL Server and Restore a Backup

[60 Marks]

The main tasks for this exercise are as follows:

- Create an RDP (Remote Desktop Protocol) connection to SQL Server on an Azure Virtual Machine
- Download a database backup file.
- Restore the database in SQL Server using SQL Server Management Studio
- Query the database to confirm its availability

Task 1: Connect to the Virtual Machine and download the backup file

- On the Overview page for the virtual machine, select the Connect button and choose RDP.

Home > CreateVm-microsoftsqlserver.sql2019-ws2019-sqldev-20200508150309 | Overview > dp300sqlvmlab01

dp300sqlvmlab01
Virtual machine

Search (Ctrl+/) << Connect Start Restart Stop Capture Delete Refresh

RDP

SSH

Bastion

Location
West US 2

Subscription (change)
[Microsoft Azure Sponsorship](#)

Subscription ID
0192e014-eabc-49cb-845e-fc66e11fa7b3

Computer name
dp300sqlvmlab01

Operating system
Windows (Windows Server 2019 Datacenter)

Size
Standard D2s v3 (2 vcpus, 8 GiB memory)

Tags (change)
[Click here to add tags](#)

Azure Spot
N/A

Public IP address
[52.250.116.104](#)

Private IP address
10.0.0.4

Public IP address (IPv6)
-

Private IP address (IPv6)
-

Virtual network/subnet
[DP-300-Lab01-vnet/default](#)

DNS name
[Configure](#)

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Networking

Connect

Disks

Size

Security

Extensions

2. On the RDP tab, select the Download RDP File button.

Home > CreateVm-microsoftsqlserver.sql2019-ws2019-sqldev-20200508150309 | Overview > dp300sqlvmlab01 | Connect

dp300sqlvmlab01 | Connect
Virtual machine

Search (Ctrl+/) << To improve security, enable just-in-time access on this VM. →

RDP SSH BASTION

Connect with RDP

To connect to your virtual machine via RDP, select an IP address, optionally change the port number, and download the RDP file.

IP address *
Public IP address ()

Port number *
3389

Download RDP File

Can't connect?

[Test your connection](#)

[Troubleshoot RDP connectivity issues](#)

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Networking

Connect

Disks

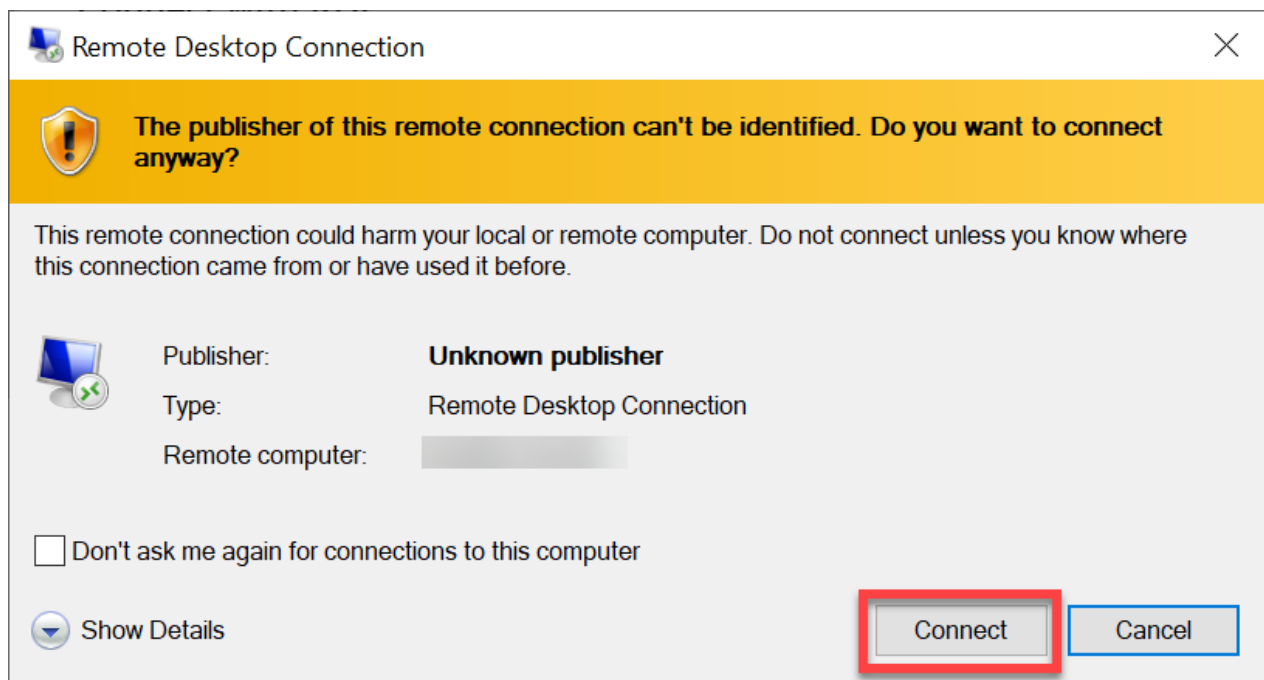
Size

Security

Extensions

Continuous delivery

3. Open the RDP file that was just downloaded. When a dialog appears asking if you want to connect, select the Connect button.




4. In the Windows Security dialog if you receive the PIN dialog, select More choices. Then choose Use a different account. If you don't receive the PIN dialog, you can proceed to Step 5.

Windows Security

Enter your credentials

These credentials will be used to connect to [redacted].

 PIN

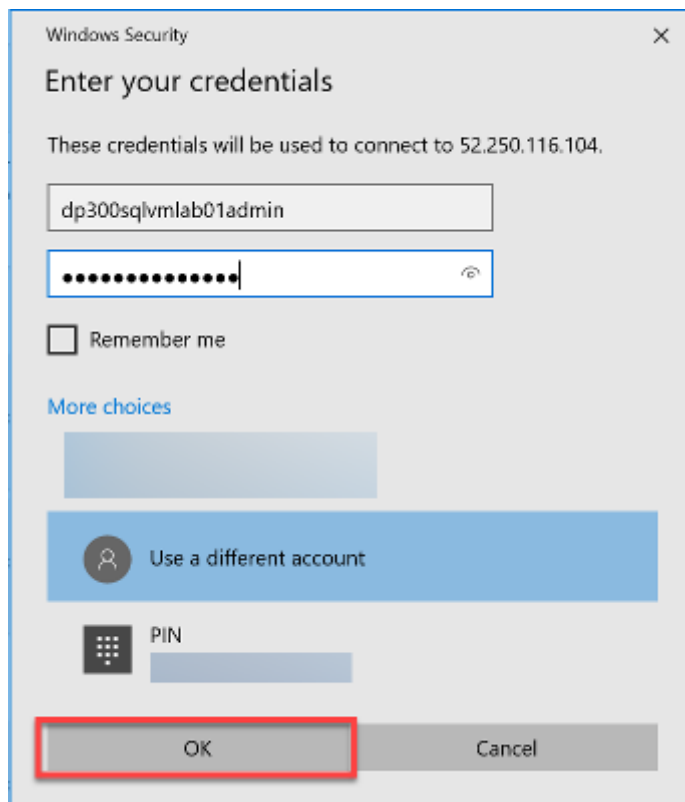
[I forgot my PIN](#)

☐ Remember me

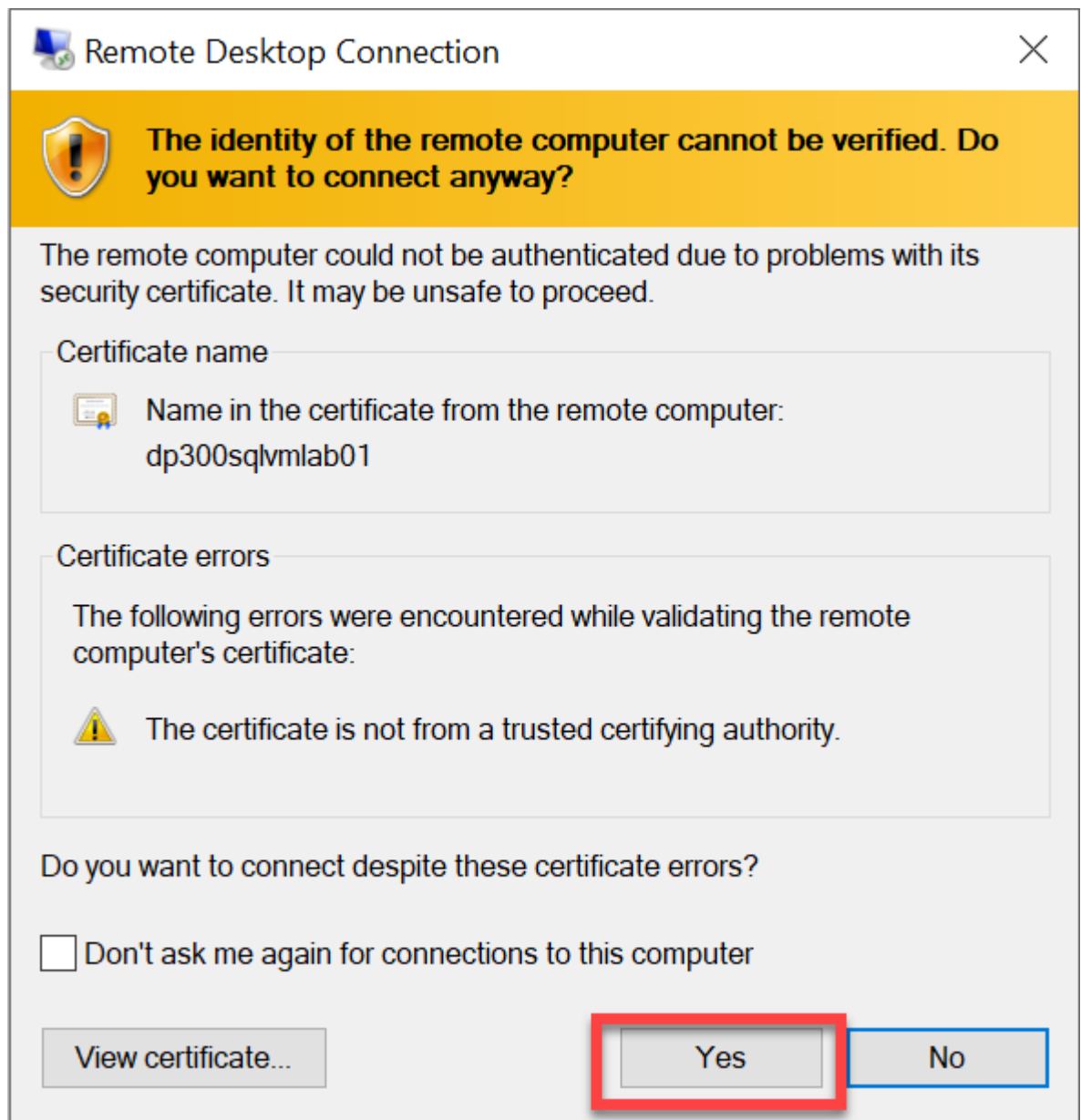
[More choices](#)

Cancel

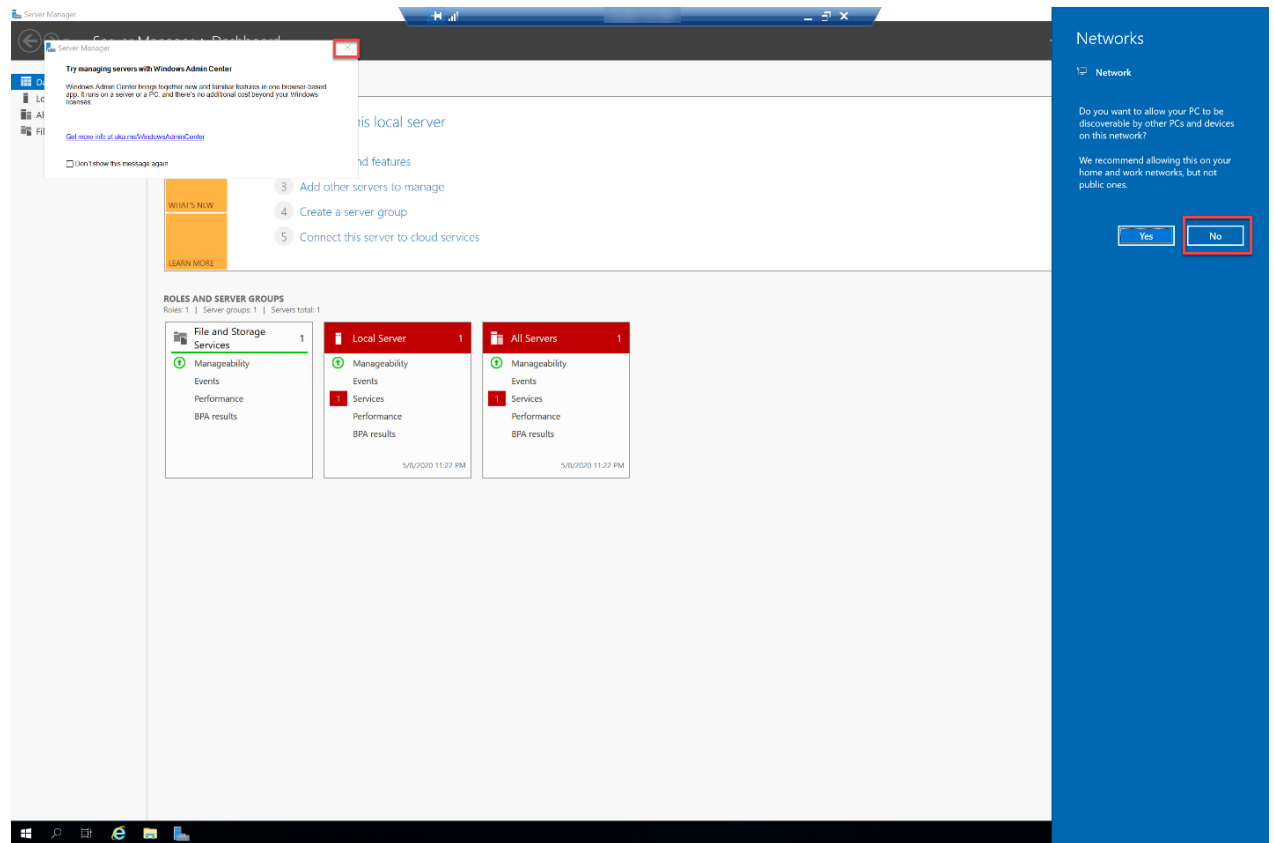
5. Enter the username and password selected during the virtual machine provisioning process. Then select the OK button.



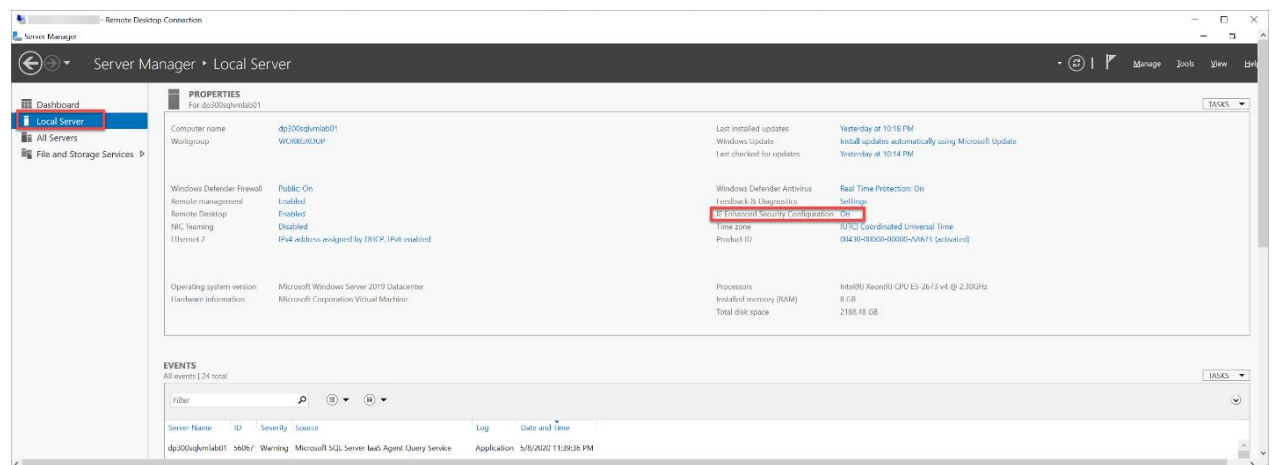
6. When the Remote Desktop Connection dialog appears asking if you want to connect, select the Yes button.



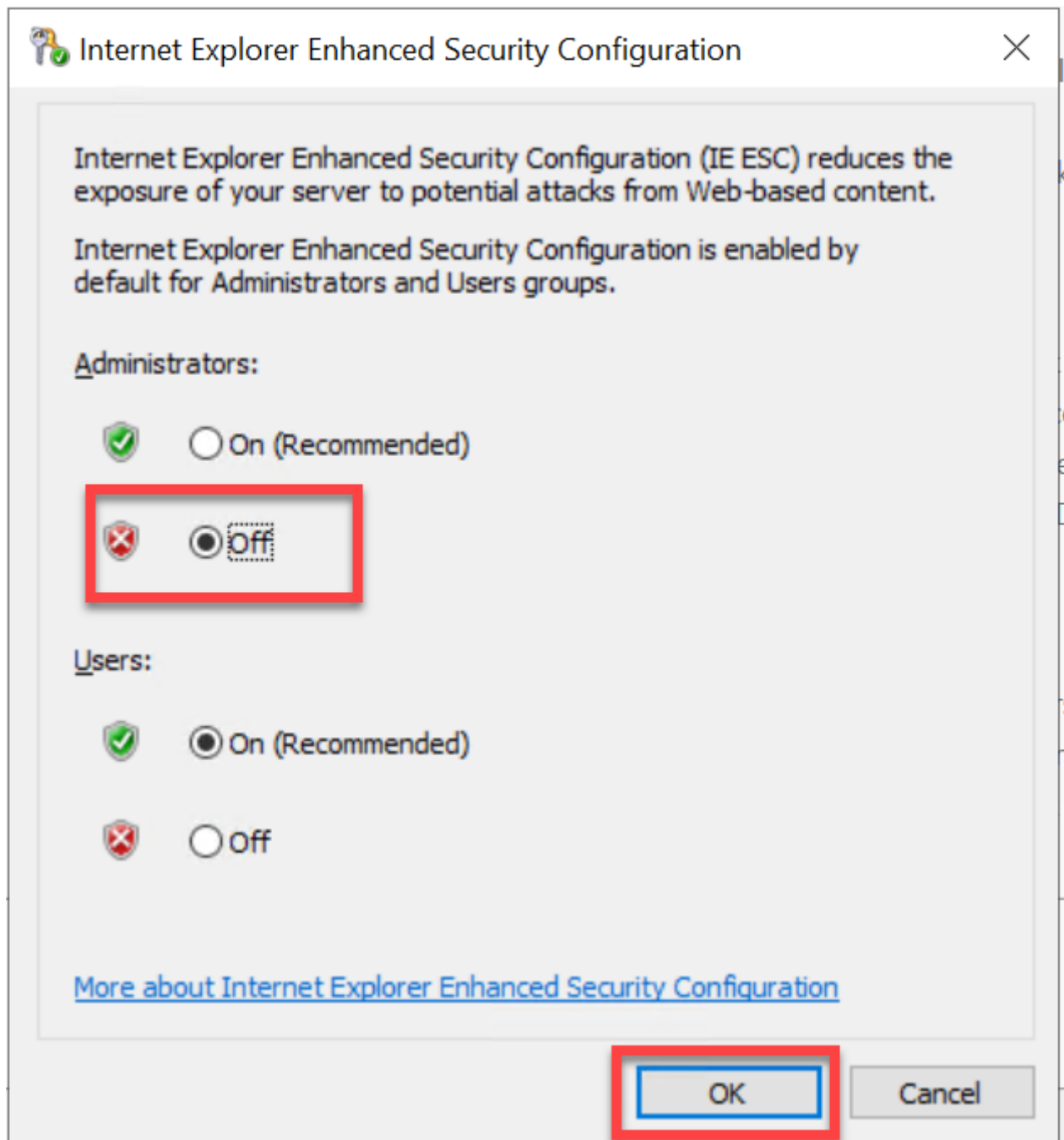
7. A Remote Desktop window will open. On the right, select the No button to indicate you do not want the computer to be discoverable by other devices on the network. Close the small Server Manager popup dialog by clicking the X in the top right of the box. Keep the big Server Manager Window open.



8. In the Server Manager window, select Local Server on the left and then select On next to IE Enhanced Security Configuration.



9. When the Internet Explorer Enhanced Security Configuration dialog appears, set Administrators to Off. Then select the OK button.

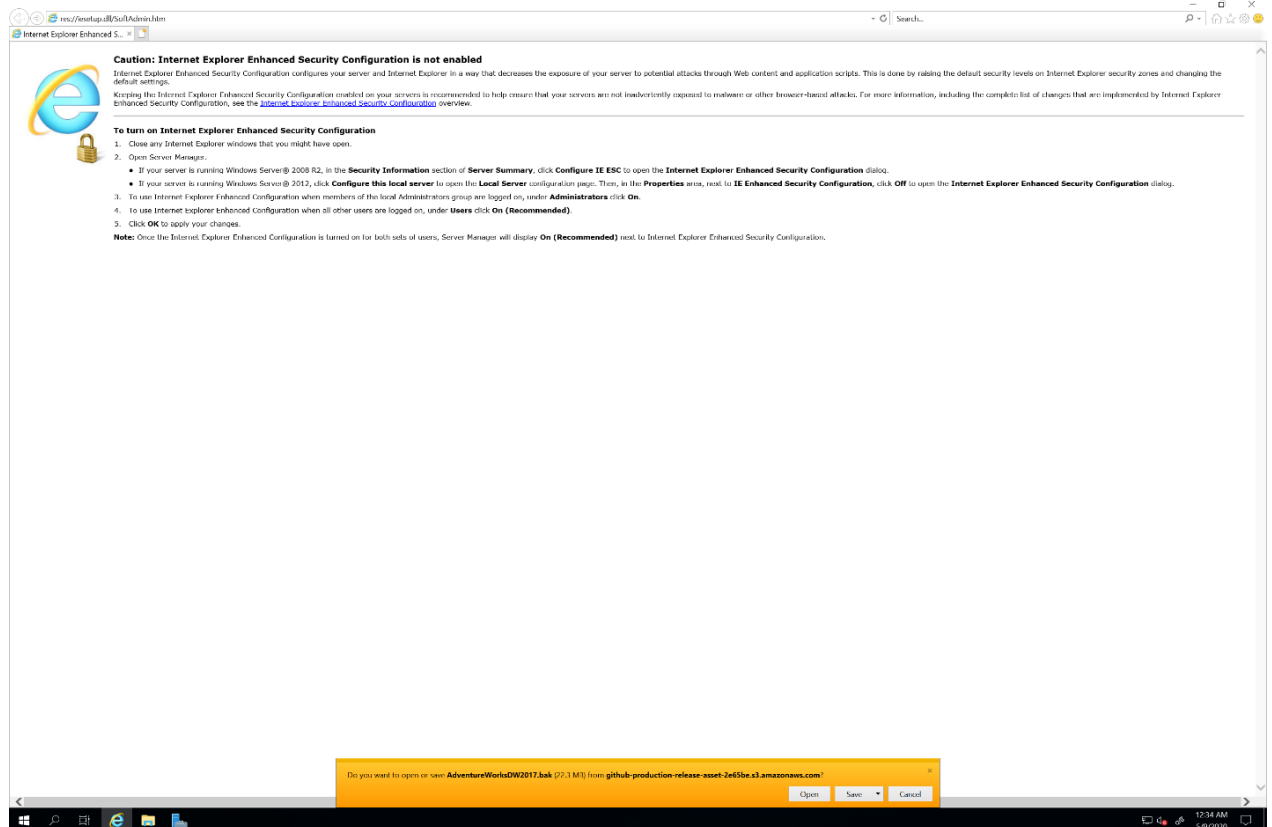


10. Open Internet Explorer by selecting the icon from the task bar.

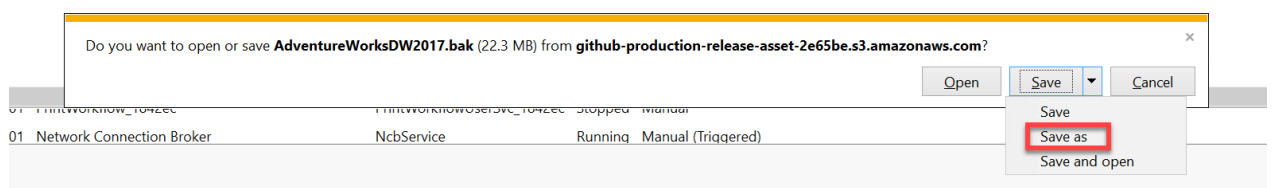


11. In Internet Explorer, navigate to the following URL:

<https://github.com/Microsoft/sql-server-samples/releases/download/adventureworks/AdventureWorksDW2017.bak>

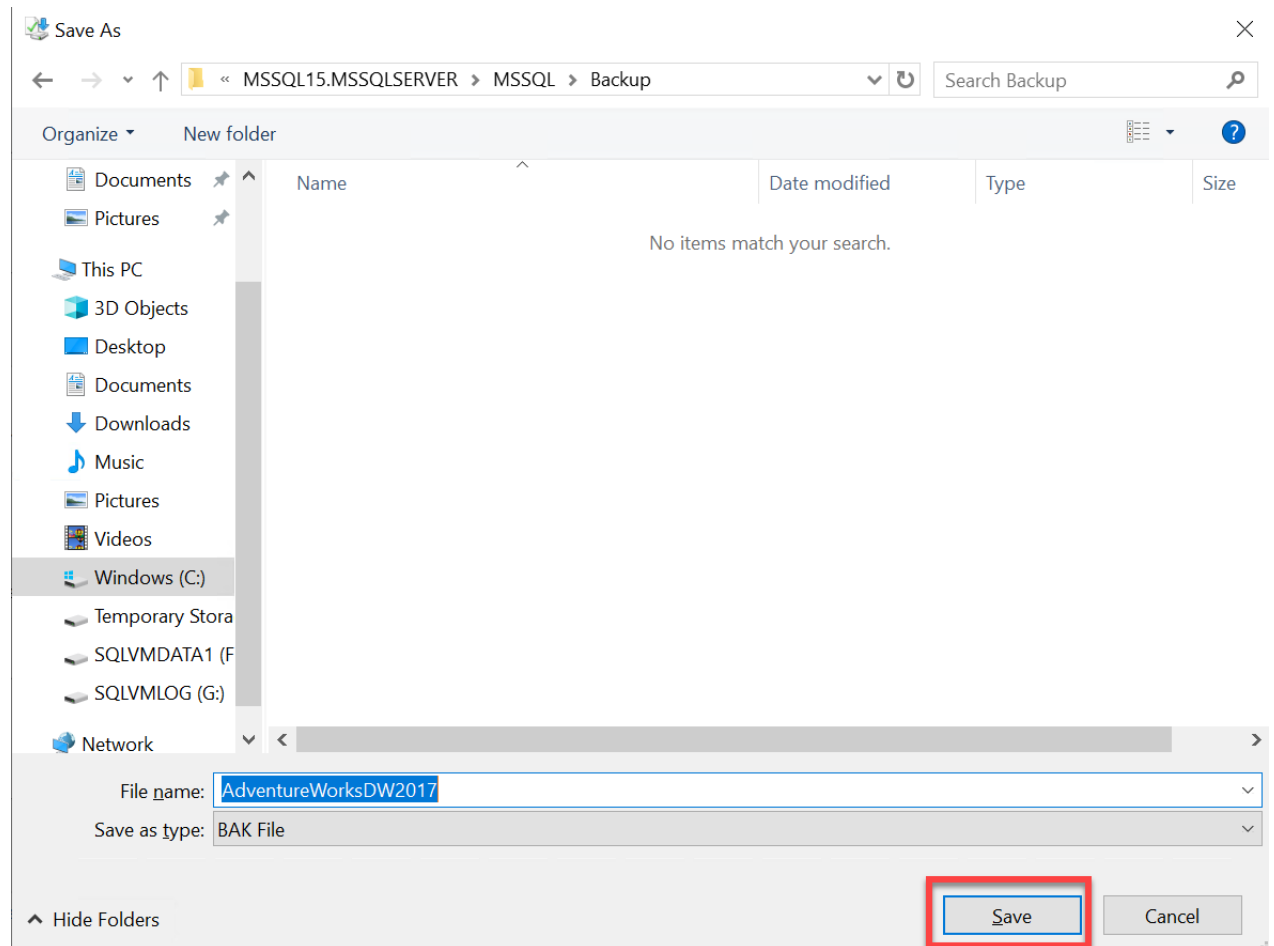


12. In the dialog, select the dropdown next to Save and choose Save As.



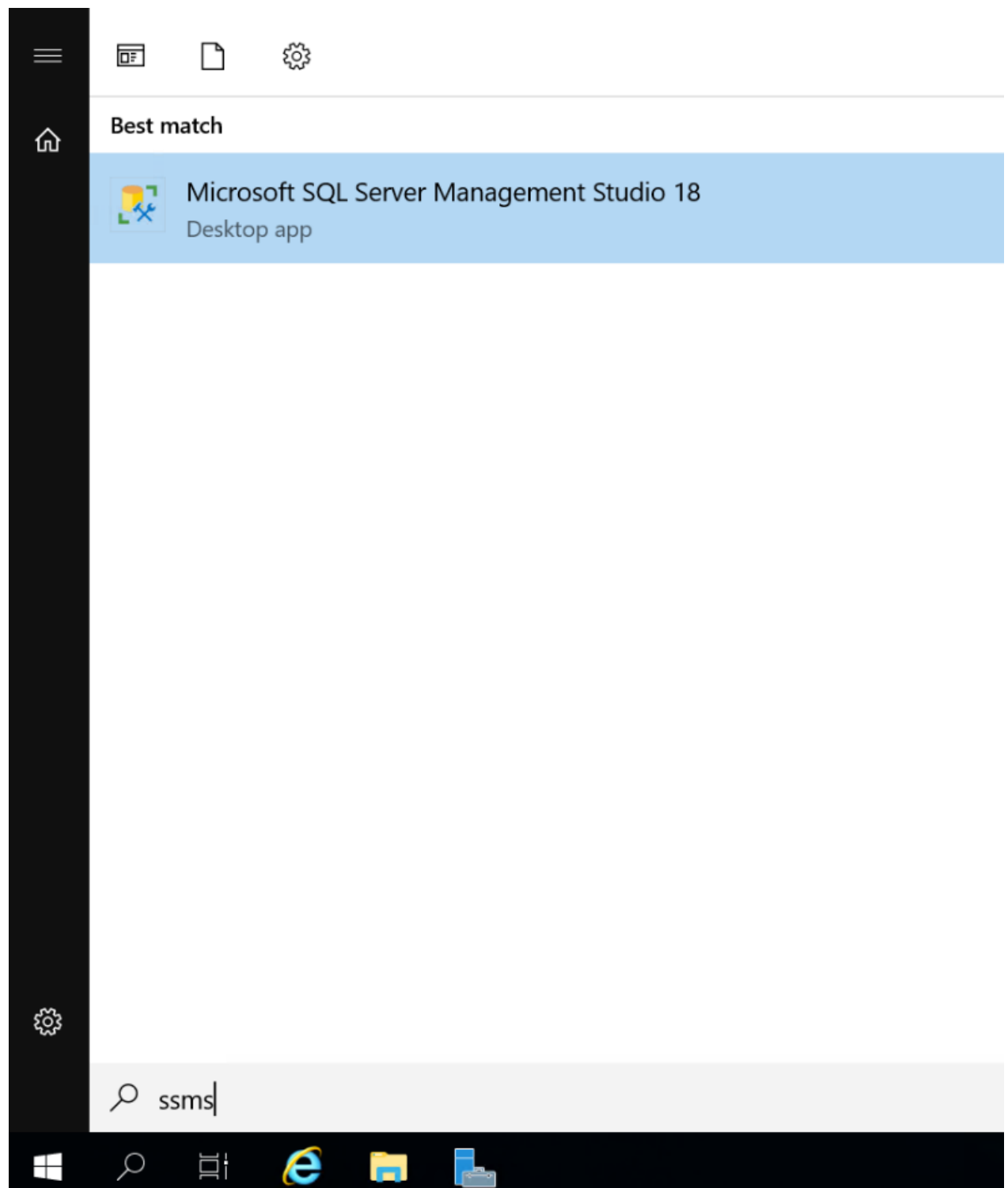
13. In the Save As dialog, navigate to the following folder location:

C:\Program Files\Microsoft SQL Server\MSSQL15.MSSQLSERVER\MSSQL\Backup.
Leave the file name as AdventureWorksDW2017 and the type as BAK file. Select the Save button.

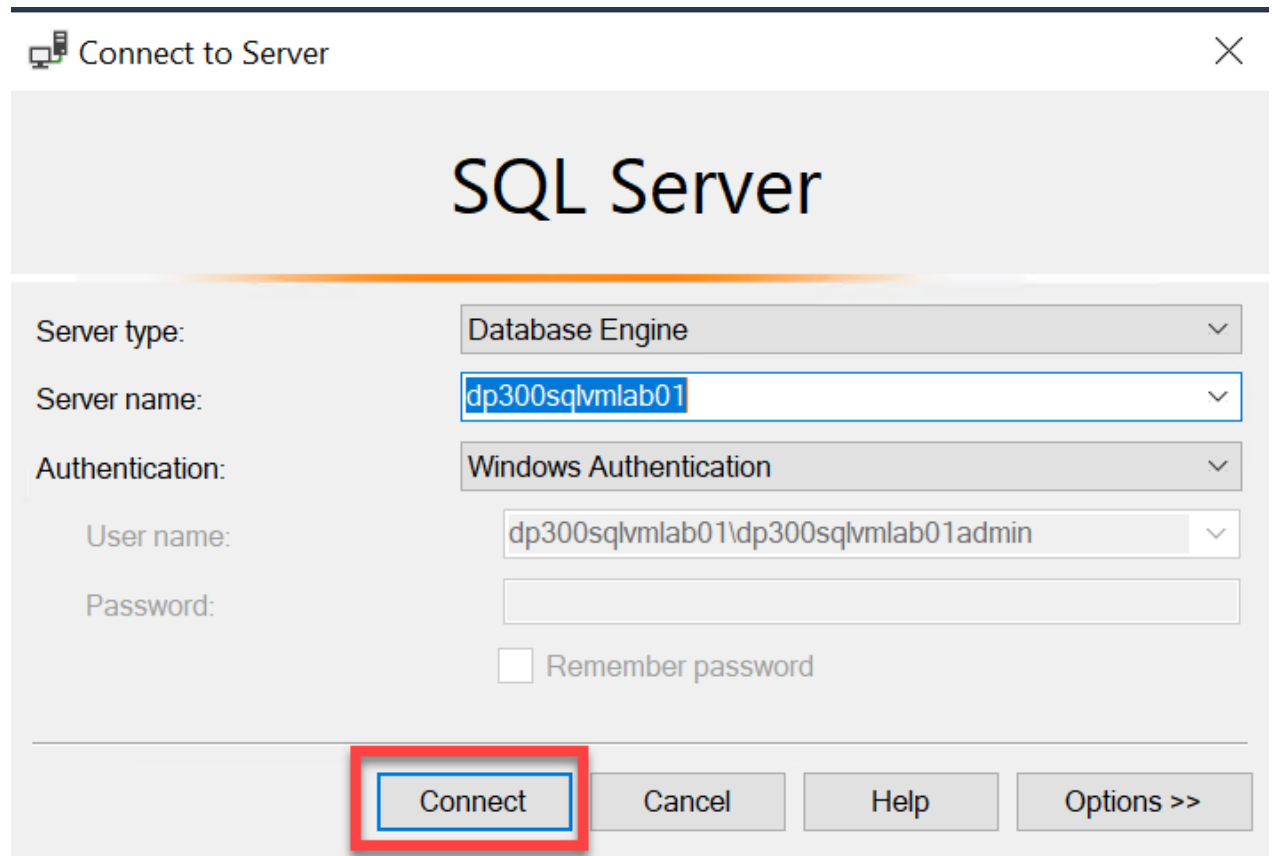


Task 2: Restore the Database and Verify its Availability

1. Select the Windows Start button and type SSMS. Select Microsoft SQL Server Management Studio 18 from the list.



2. When Management Studio opens, the Connect to Server dialog will be pre-populated to the local machine. Select the Connect button.



Connect to Server

SQL Server

Server type: Database Engine

Server name: dp300sqlvmlab01

Authentication: Windows Authentication

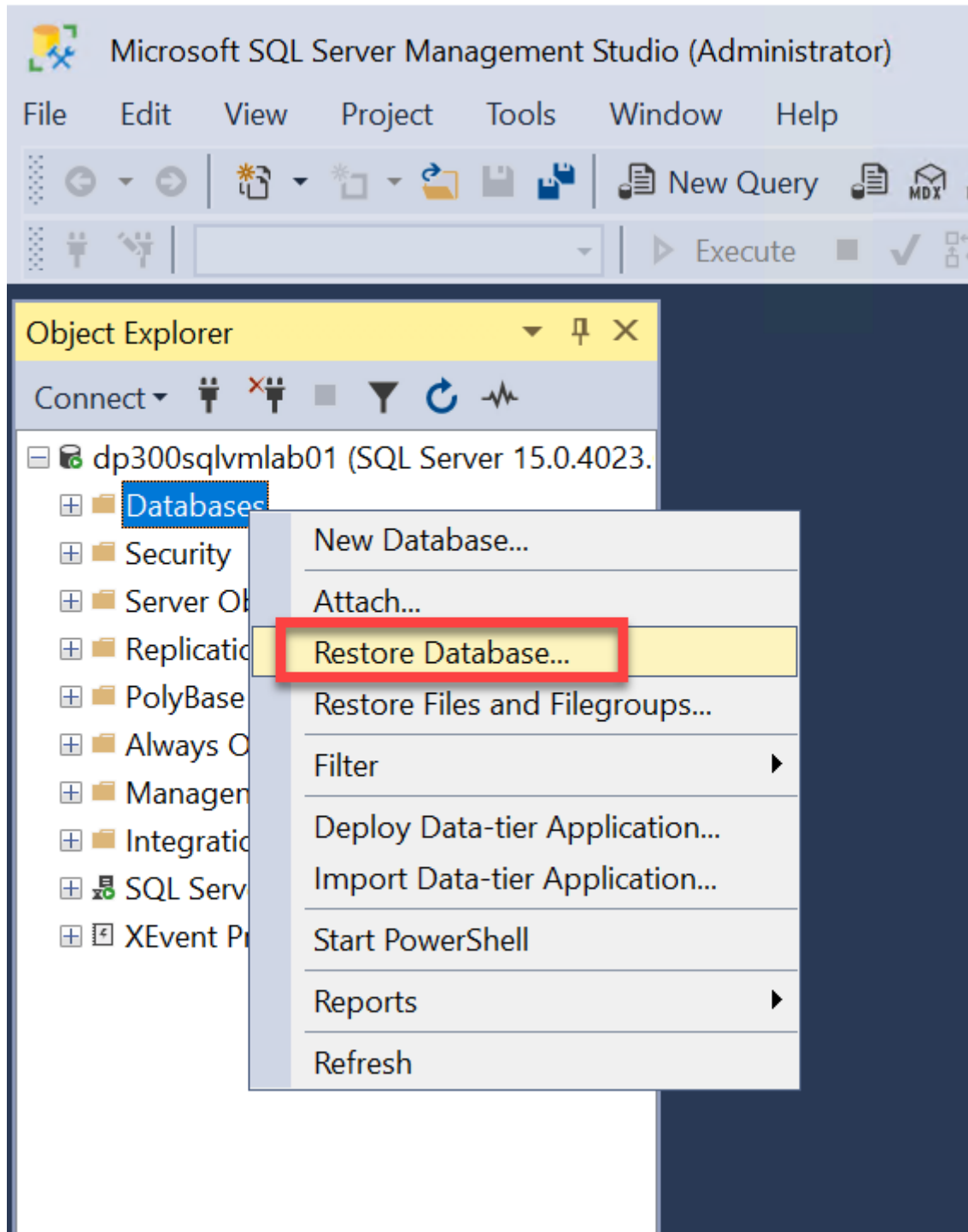
User name: dp300sqlvmlab01\dp300sqlvmlab01admin

Password:

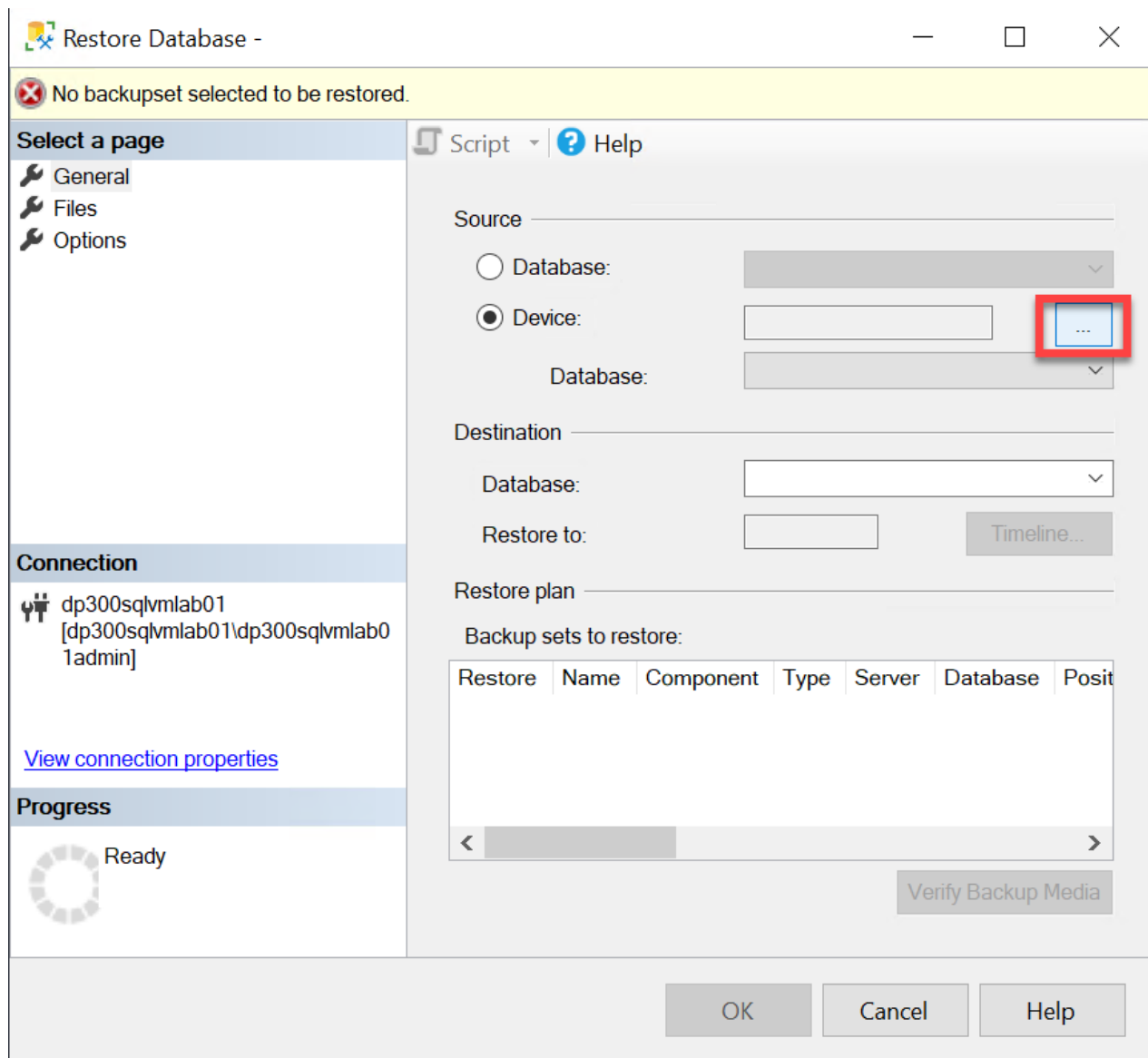
☐ Remember password

Connect Cancel Help Options >>

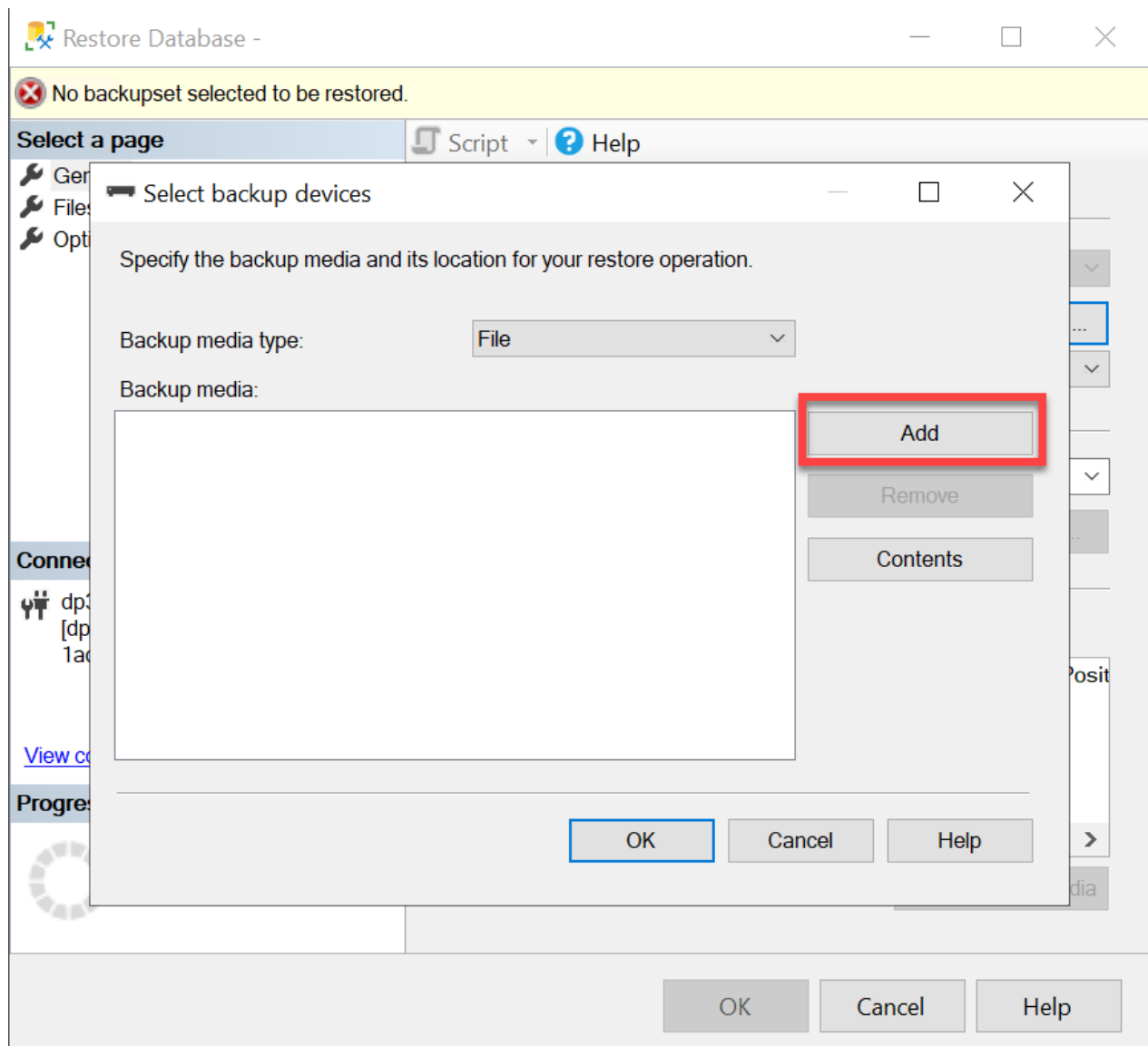
3. In the Object Explorer, right-click on the Databases node and choose Restore Database...



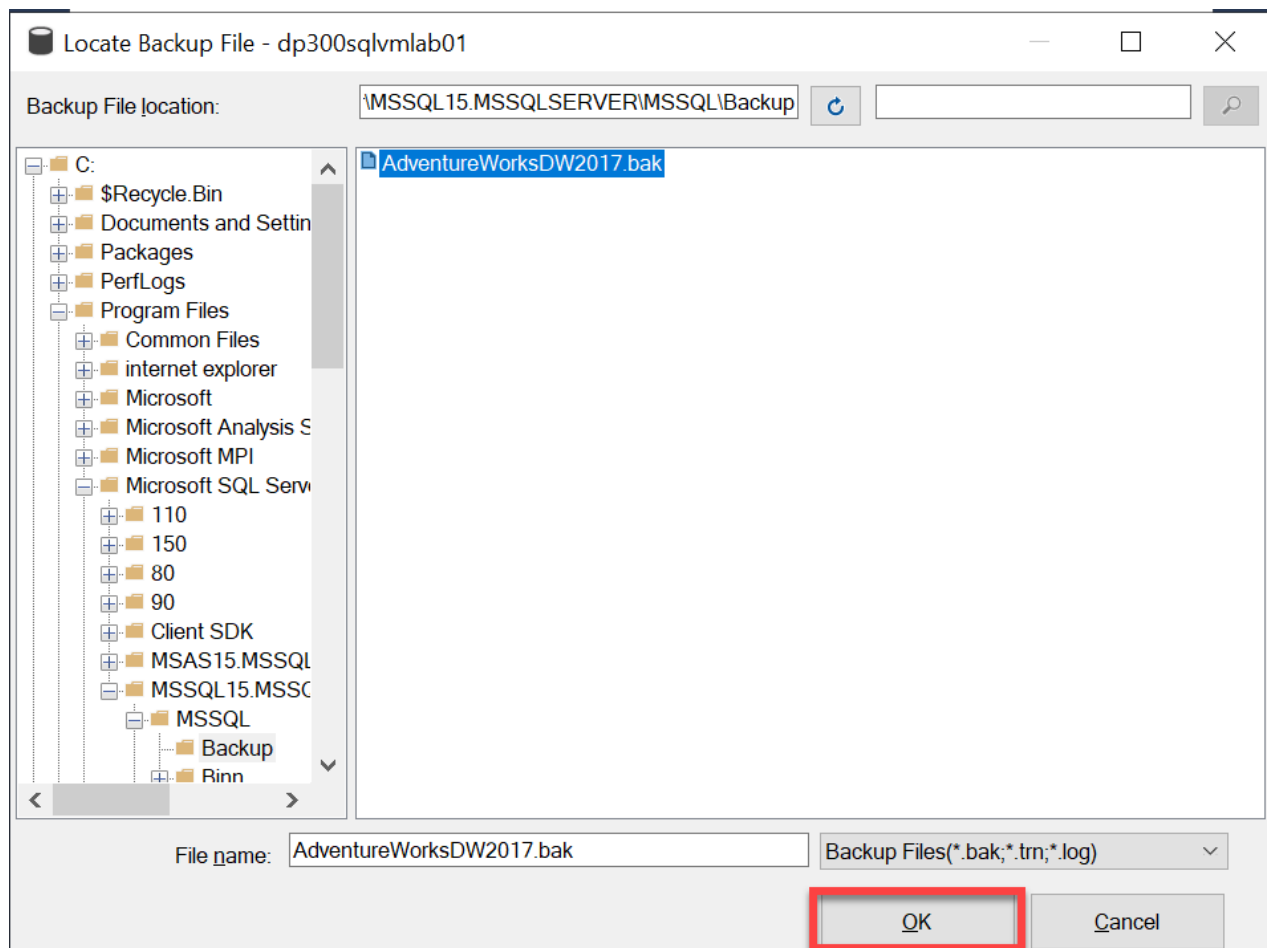
4. In the Restore Database dialog, Select Device under Source, and select the button to the right of device labeled with an ellipsis.



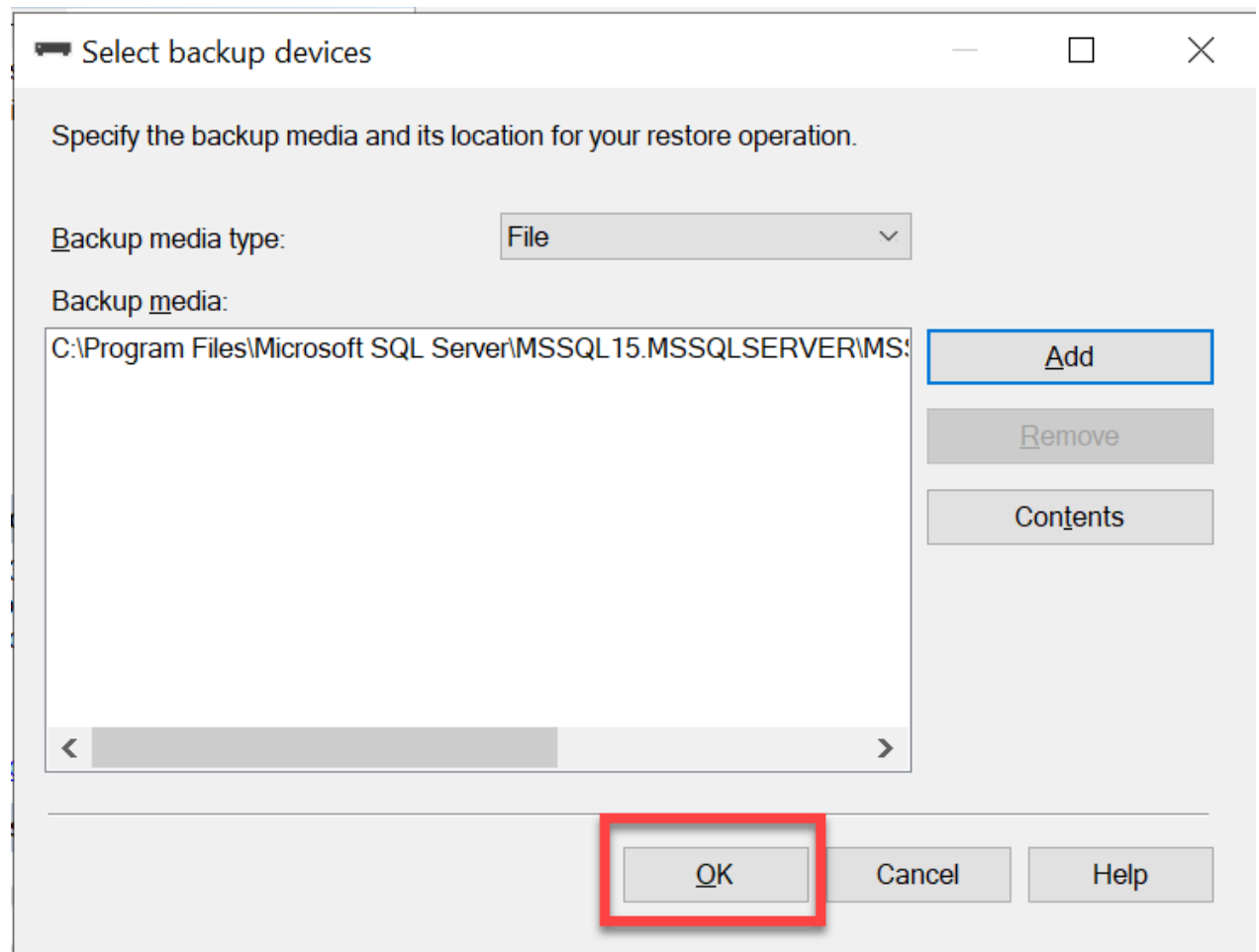
5. In the Select backup devices dialog, select Add.



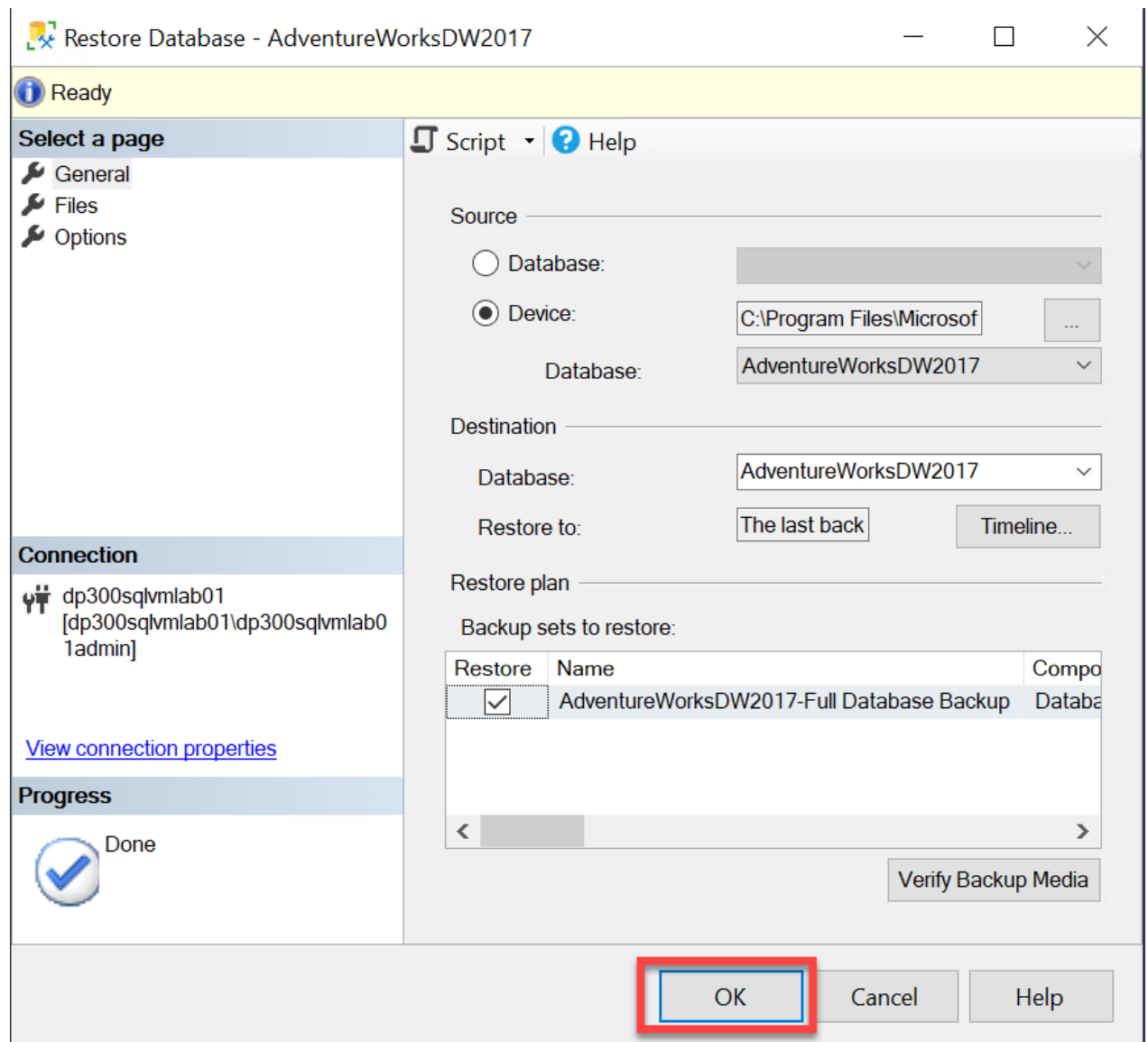
6. In the Local Backup File dialog, select AdventureWorksDW2017.bak and select the OK button.



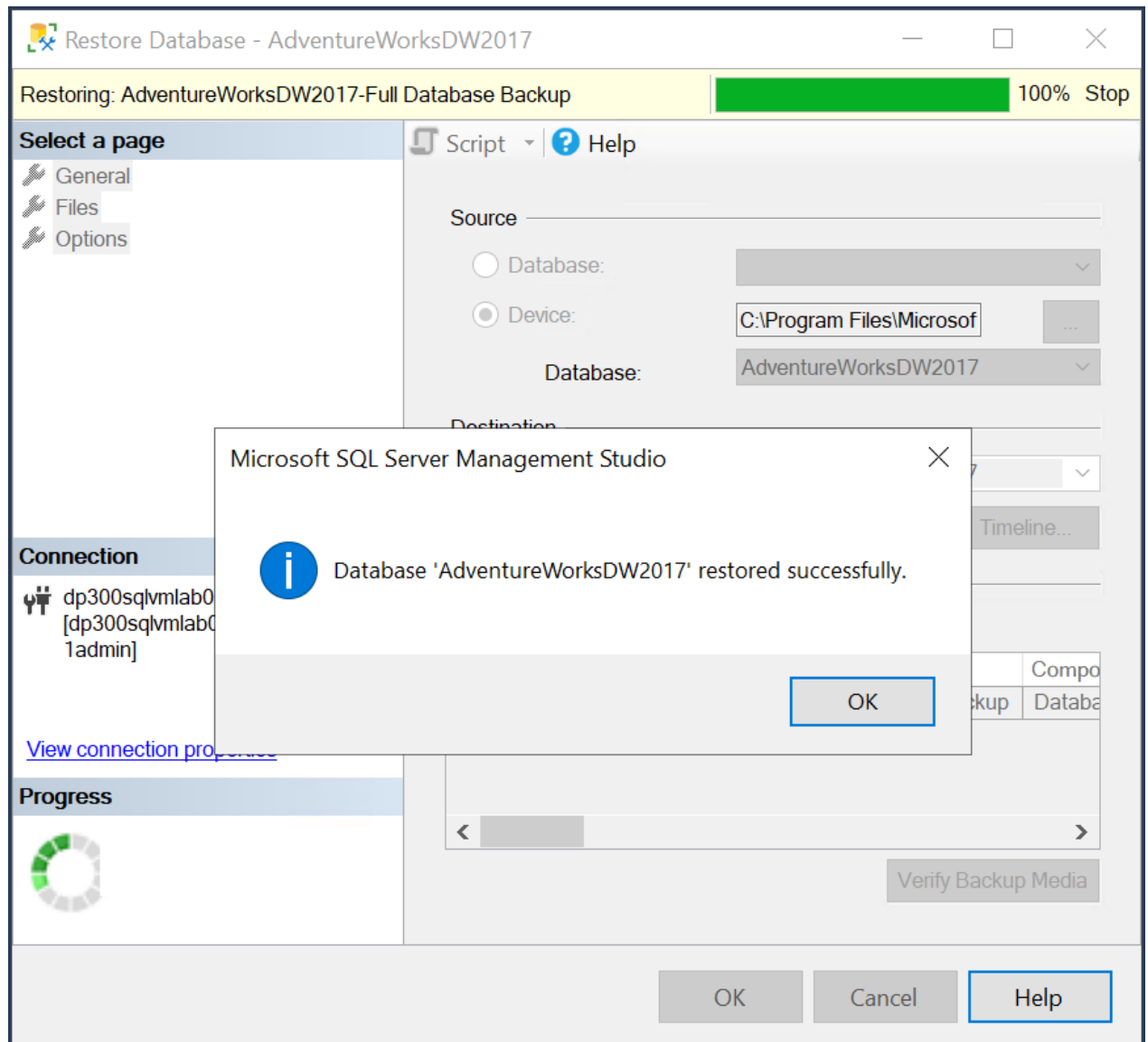
7. Verify that there is now one item listed under Backup media in the Select backup devices dialog. Then select the OK button.



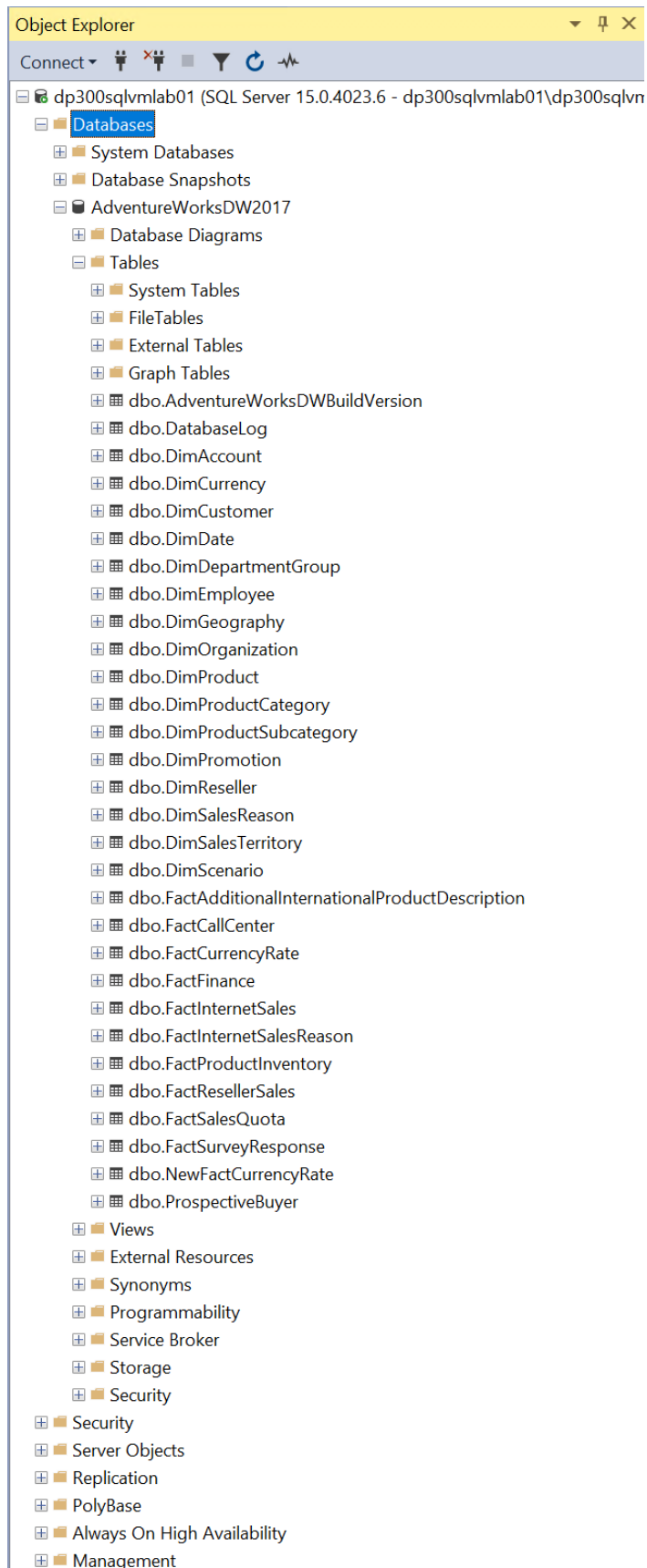
8. Verify that there is one item listed under Backup sets to restore in the Restore Database dialog. Then select the OK button.



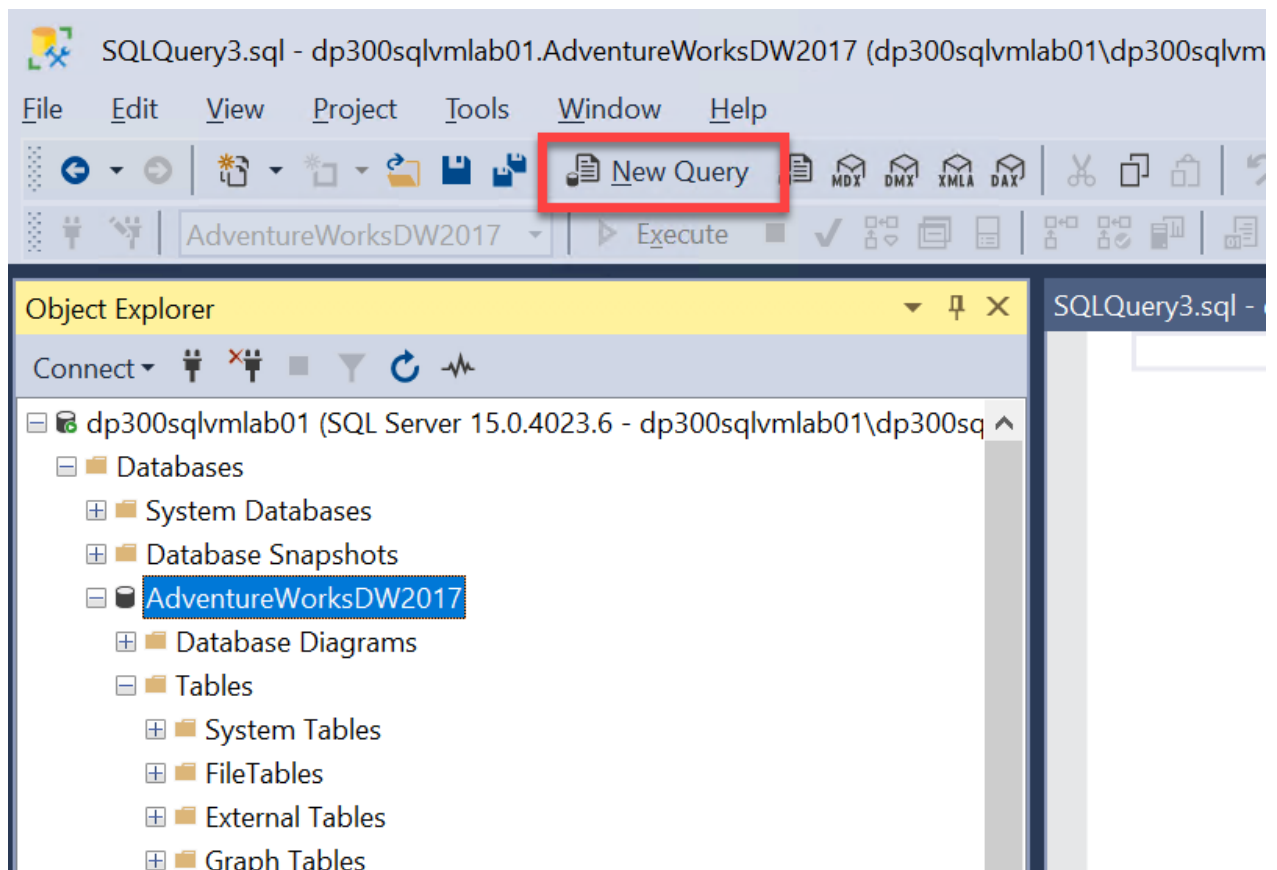
9. Once the database restore completes, a dialog box will appear with the message "Database 'AdventureWorksDW2017' restored successfully". Select the OK button.



10. In the Object Explorer, expand the Databases node, then expand the AdventureWorksDW2017 node, then expand the Tables node. Verify that the database contains several tables including dbo.DimAccount.

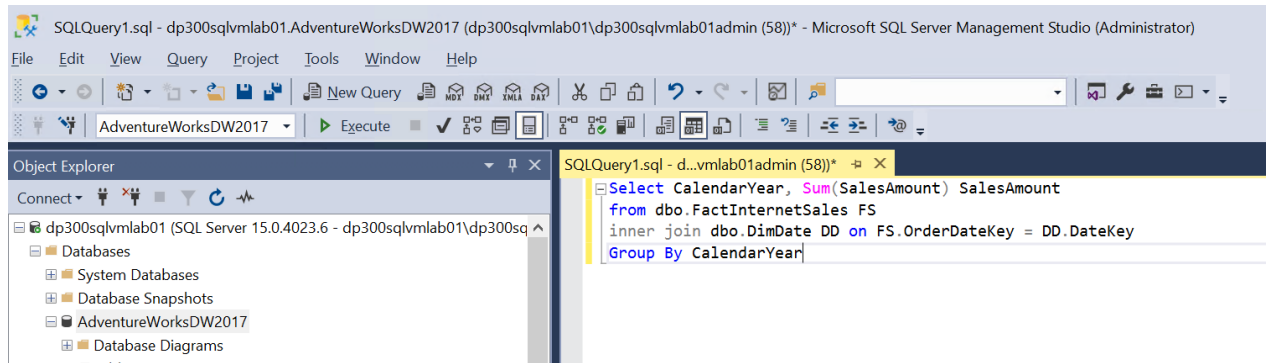


11. In Management Studio, select the AdventureWorksDW2017 node in the Object Explorer. Then select the New Query button.

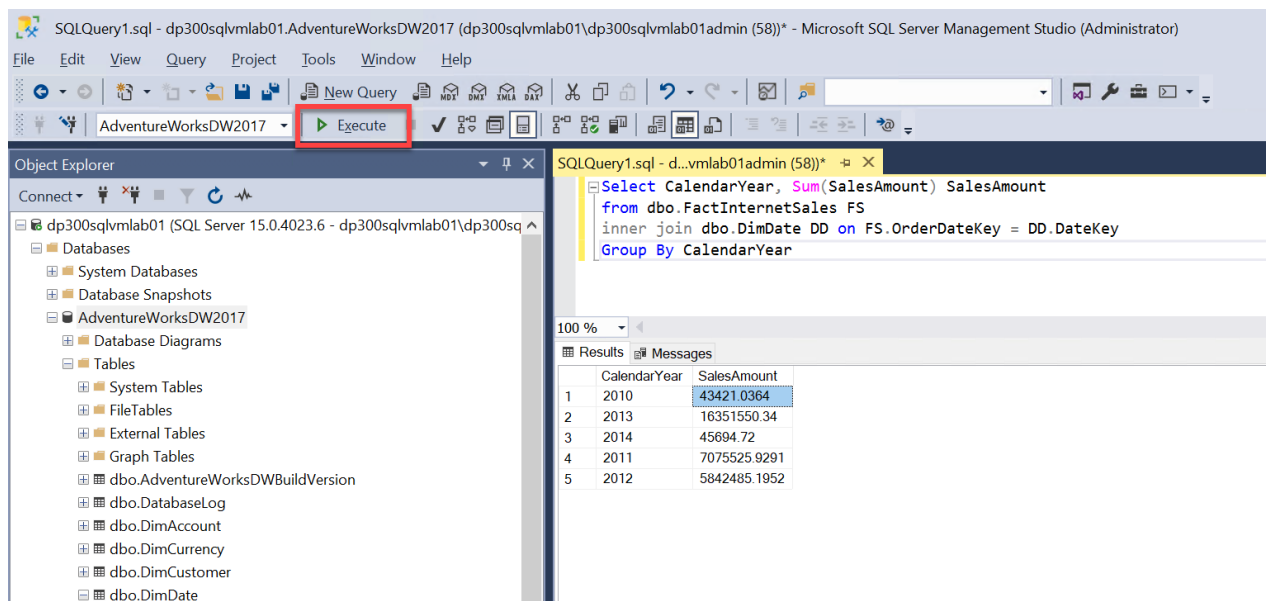


12. Copy and paste the following statement into the new query window:

```
SELECT CalendarYear, Sum(SalesAmount) SalesAmount
FROM dbo.FactInternetSales FS
INNER JOIN dbo.DimDate DD ON FS.OrderDateKey = DD.DateKey
GROUP BY CalendarYear
```

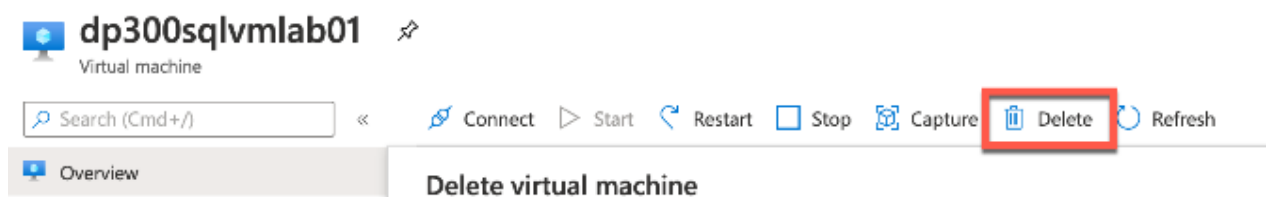


13. Select the Execute button execute the query. Verify that the sales amount for 2010 is **43421.0364**.



Task 3: Clean Up

1. Exit out of the Remote Desktop.
2. Delete the VM you created in this lab to save costs.
3. Navigate to the main (Overview) blade for the **dp300sqlvmlab01** Virtual Machine and click the delete button in the menu.




4. Click **OK**.

Completed Declaration of Authenticity

I Ruan van straaten hereby
(FULL NAME)

declare that the contents of this assignment FA2_DSD631 is entirely my own work except for the following documents: (List the documents and page numbers of work in this portfolio that were generated in a group)

Activity	Date

Signature:  Date: 2022/04/04