

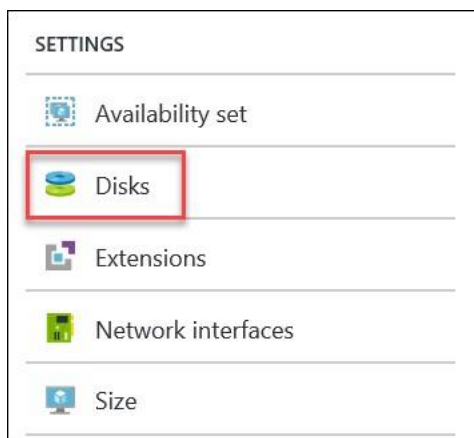
# Virtual Machine Storage

## Lab Overview

In this lab, you will learn how to attach additional storage from the Azure Management Portal and manage the underlying storage using Azure Storage Explorer.

## Exercise 1: Attach Additional Storage

1. Within the Azure Management portal, click **Browse, Virtual Machines** and then click **WebVM-1**.
2. On the **Settings Blade**, under the **GENERAL** section, click **Disks**.



3. Click **Attach new**.



4. Specify the following settings
  - Name: **WebVM-1-DataDisk1**
  - Type: **HDD**
  - Host caching: **Read/Write**.
  - Location: Choose the storage account in the **Infosysvmrmrg** Resource Group and choose the **vhds** container (Click **Select** and then **OK**)

**Attach new...** WebVM-1

\* Name: WebVM-1-DataDisk1 ✓

\* Type: HDD

\* Size (GiB): 1023

Estimated performance ⓘ

IOPS LIMIT: 500

THROUGHPUT LIMIT (MB/S): 60

\* Location ⓘ: https://opsvmmrg590.blob.core....

\* Host caching ⓘ: Read/Write

**Storage accounts**

+ Storage account Refresh

Search storage accounts

NAME	TYPE	RESOURCE GROUP
opsvmmrg590	Standard-LRS	opsvmmrg

**Containers** opsvmmrg590

+ Container Refresh

Search containers by prefix

NAME
bootdiagnostics-sqlvm1-5281373e-724c-40d9
bootdiagnostics-sqlvm1-9fd51f42-2b8c-4fb6-4
bootdiagnostics-sqlvm2-d8d25a3e-ac01-468f
bootdiagnostics-webvm1-7015a7b9-08eb-4a9
bootdiagnostics-webvm2-805fc907-2926-4cae
vhds

5. Repeat the process and name the second disk **WebVM-1-DataDisk2**.

**Attach new...** WebVM-1

\* Name: WebVM-1-DataDisk2 ✓

\* Type: HDD

\* Size (GiB): 1023

Estimated performance ⓘ

IOPS LIMIT: 500

THROUGHPUT LIMIT (MB/S): 60

\* Location ⓘ: https://opsvmmrg590.blob.core....

\* Host caching ⓘ: Read/Write

**Storage accounts**

+ Storage account Refresh

Search storage accounts

NAME	TYPE	RESOURCE GROUP
opsvmmrg590	Standard-LRS	opsvmmrg

**Containers** opsvmmrg590

+ Container Refresh

Search containers by prefix

NAME
bootdiagnostics-sqlvm1-5281373e-724c-40d9
bootdiagnostics-sqlvm1-9fd51f42-2b8c-4fb6-4
bootdiagnostics-sqlvm2-d8d25a3e-ac01-468f
bootdiagnostics-webvm1-7015a7b9-08eb-4a9
bootdiagnostics-webvm2-805fc907-2926-4cae
vhds

6. Your disk configuration should look similar to the following:

OS DISK	
WebVM-1	Not enabled
DATA DISKS	
WebVM-1-DataDisk1	1023 GiB
WebVM-1-DataDisk2	1023 GiB

## Exercise 2: Create a new Storage Space for the disks

1. Click the **Connect** button on the toolbar for the **WebVM-1** virtual to connect to it. When prompted use the following credentials:
  - Login: **demouser**
  - Password: **demo@pass123**

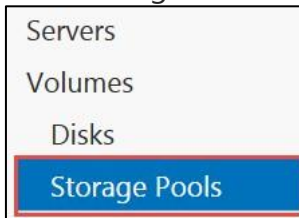
2. Inside the virtual machine click Windows Server Manager.



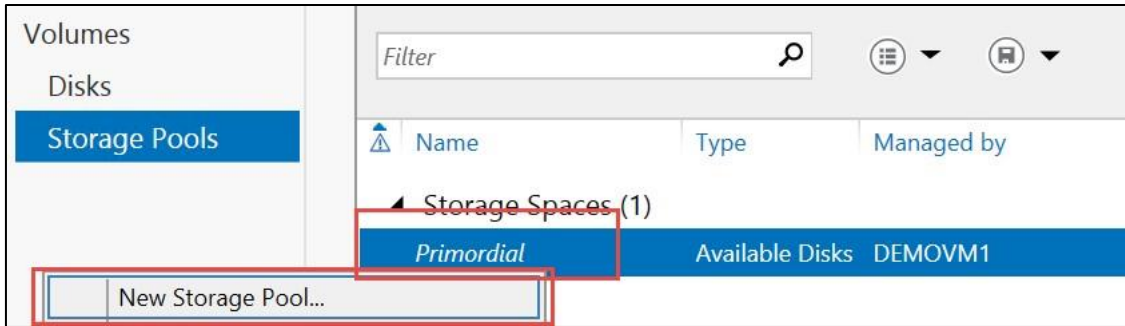
3. Click **File and Storage Services** from within Windows Server Manager.



4. Click Storage Pools.



5. Right click on the **Primordial** disks column, and click **New Storage Pool**.



6. Click **Next** on the before you begin step.

7. Specify the name **StorageSpaceDemo** and click **Next**.

Specify a storage pool name and subsystem

Before You Begin  
Storage Pool Name  
Physical Disks  
Confirmation  
Results

Name: StorageSpaceDemo

Description:

8. Select both disks and click **Next**.

Select physical disks for the storage pool

Before You Begin  
Storage Pool Name  
Physical Disks  
Confirmation  
Results

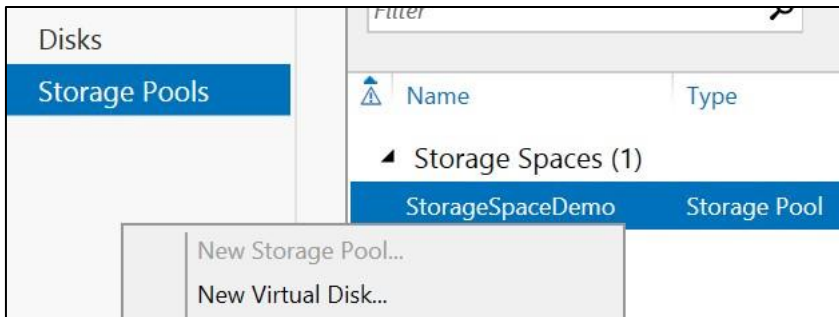
Select physical disks for the storage pool, and choose whether any disks should be allocated disks.

Physical disks:

<input checked="" type="checkbox"/>	Slot	Name	Capacity	Bus	RPM	Model	Allocation
<input checked="" type="checkbox"/>		PhysicalDisk2 (...)	1,023 GB	SAS		Virtual Disk	Automatic
<input checked="" type="checkbox"/>		PhysicalDisk3 (...)	1,023 GB	SAS		Virtual Disk	Automatic

9. Click **Create** on the confirmation step and then **Close** after the storage space is created.

10. Right click on the new **Storage Space**, and click **New Virtual Disk**.



11. Click **Next** on the Before You Begin dialog, and then select the **Storage Pool** created earlier.

12. Name the disk **AzureDisk** and click **Next**.

A screenshot of the 'Specify the virtual disk name' dialog box in Windows Storage Spaces. The left sidebar contains a list of steps: 'Before You Begin', 'Storage Pool', 'Virtual Disk Name' (which is highlighted), 'Storage Layout', 'Provisioning', 'Size', 'Confirmation', and 'Results'. The main area has a 'Name:' label followed by a text box containing 'AzureDisk'. Below that is a 'Description:' label followed by a larger text box. At the bottom, there is an unchecked checkbox with the text 'Create storage tiers on this virtual disk' and a subtext 'Storage tiers enable automatic movement storage.'

13. For Storage Layout select **Simple**, and then click **Next**.

A screenshot of the 'Select the storage layout' dialog box. The left sidebar shows the steps: 'Before You Begin', 'Storage Pool', 'Virtual Disk Name', 'Storage Layout' (highlighted), and 'Provisioning'. The main area has a 'Layout:' label followed by a dropdown menu. The dropdown is open, showing three options: 'Simple' (which is highlighted with a red box), 'Mirror', and 'Parity'.

14. Accept the default of fixed.

### Specify the provisioning type

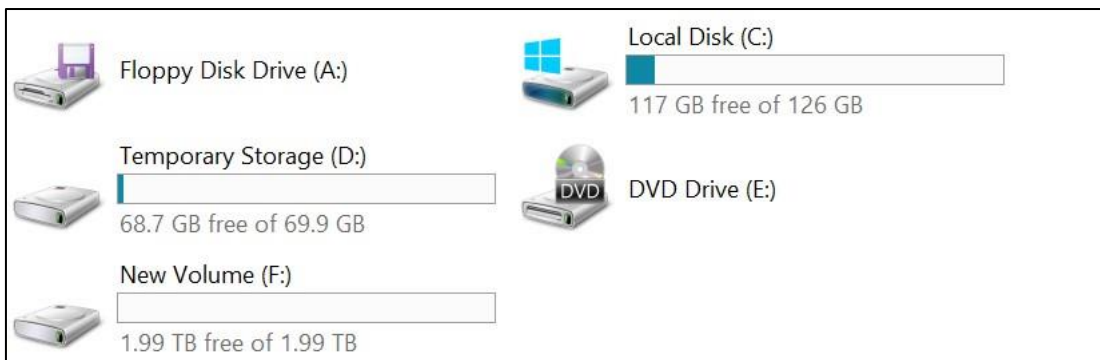
Before You Begin	<b>Provisioning type:</b> <input type="radio"/> Thin The volume uses space from the storage pool as needed, up to the volume size. <input checked="" type="radio"/> Fixed The volume uses space from the storage pool equal to the volume size.
Storage Pool	
Virtual Disk Name	
Storage Layout	
<b>Provisioning</b>	
Size	

15. Change the Size to Maximum size.

Before You Begin	Free space in this storage pool: 2.00 TB <input type="radio"/> Specify size: <div>2,044 GB</div> <input checked="" type="radio"/> Maximum size
Storage Pool	
Virtual Disk Name	
Storage Layout	
<b>Provisioning</b>	
<b>Size</b>	

16. Click **Create** on the confirm dialog and Complete the New Volume Wizard by accepting the default settings for all dialogs. Note: if the default drive letter is E, change it to **F**.

17. At the end of the lab you should have a new 2 TB volume spread across two disks.



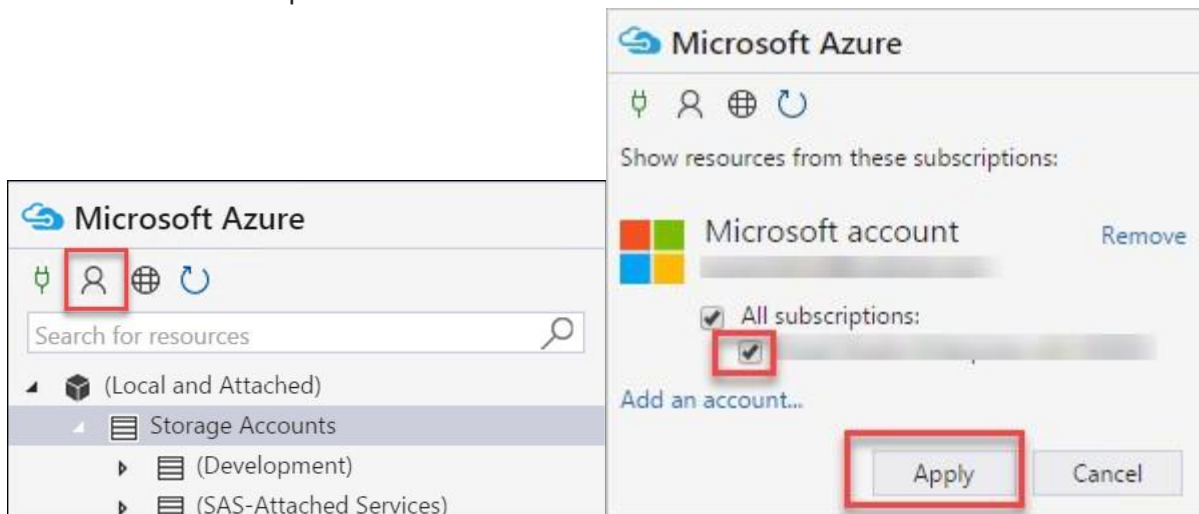
18. Disconnect from Remote Desktop Session.

## Exercise 3: Using the Azure Storage Explorer Utility to Copy Disks

1. From **LABVM** download and install Microsoft's Azure Storage Explorer from <http://storageexplorer.com/>.



2. After the application starts, click the User icon to configure access to your Azure subscription.



3. Add your account by logging in with the credentials for your Azure Subscription.

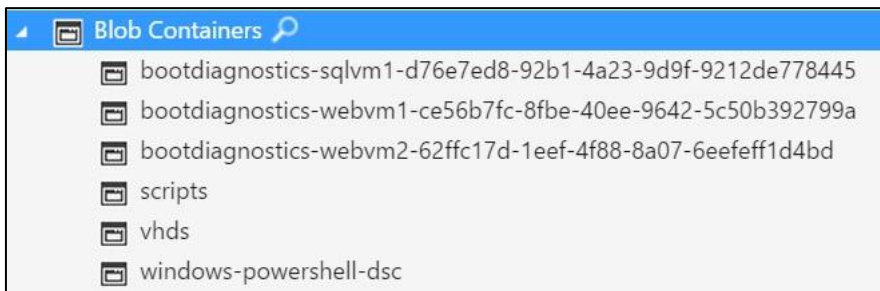
If you have multiple subscriptions associated with your Microsoft account, you will be able to filter them out to the subscription you are using for the lab.

4. Double click the storage account used by the virtual machines in earlier labs.

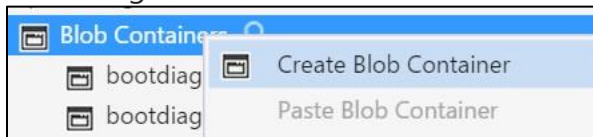




- Expand **Blob Containers**. You should see the containers for the boot diagnostics screenshots of your virtual machines, and the vhds container. This is the default location where the virtual hard disk (VHD) files for your virtual machines are stored.



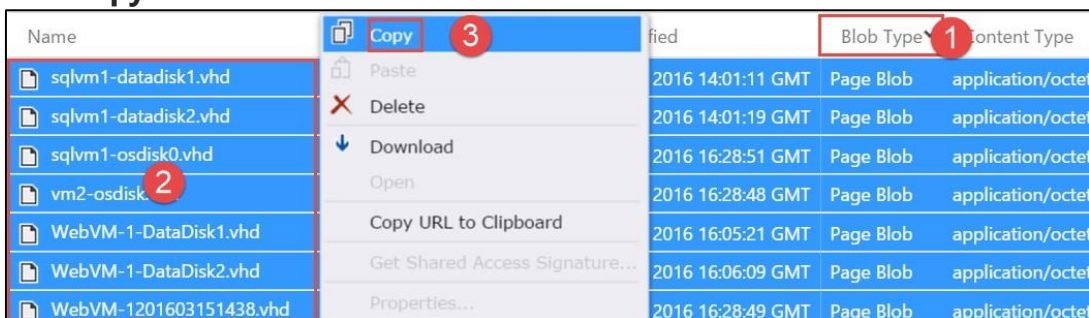
- Right click on the Blob Containers node and click **Create Blob Container**.



- Name the new container **diskcopies**.

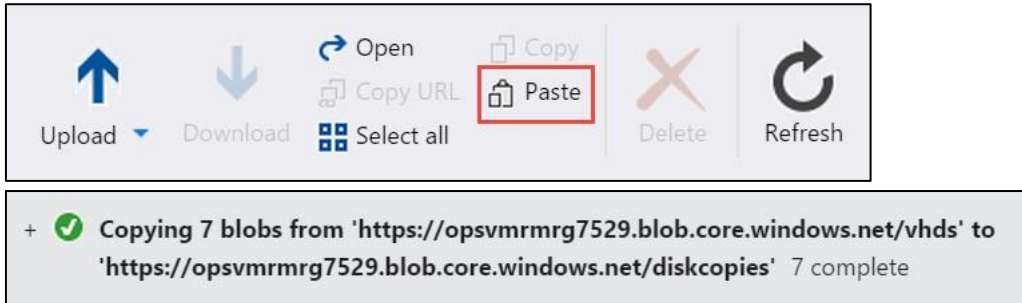


- Double-click on the **vhds** container to see its contents and then **sort** by Blob Type until Page Blob is first, **select** all of the Page Blob items, **right click** and click **Copy**.





- Double-click the diskcopies container, after it opens click **Paste** from the toolbar.



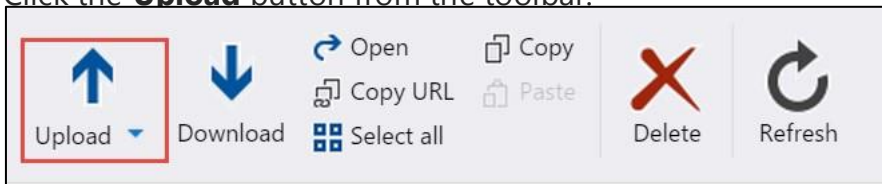
Tip: This tool can be used to copy files to different storage accounts even in remote regions.

## Exercise 4: Using the Storage Explorer Utility to Upload a Disk

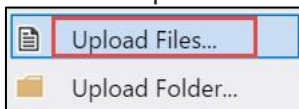
- Within the Storage Explorer Utility, open the **vhds** container of the storage account for your virtual machine.



- Click the **Upload** button from the toolbar.



- Click the Upload Files menu item.



- In the Upload files dialog, browse to **C:\InfosysgilityTraining\DataDisk.vhd** and click **Upload**.

## Upload files

Files

DataDisk.vhd 1 ...

Blob type

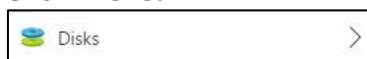
Page Blob ▼

Upload to folder (optional)

2 Upload Cancel

5. Switch back to the Azure Management Portal and open the WebVM-2 virtual machine configuration by clicking **Browse, Virtual Machines**, and **WebVM-2**.

6. Click **Disks**.



7. Click **Attach Existing**.



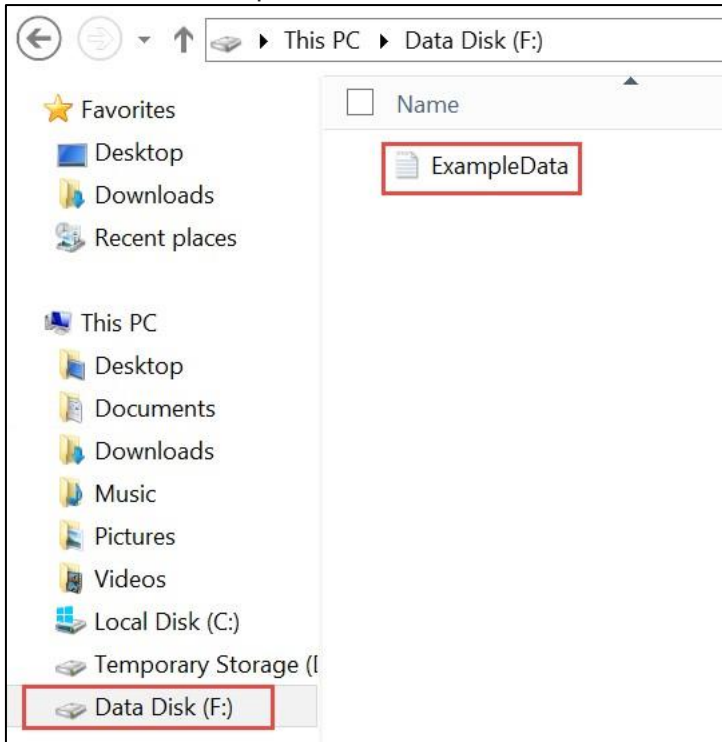
8. Browse to the storage account you uploaded the DataDisk.vhd file to, open the VHDs container, and select the **DataDisk.vhd** file, click the Select button at the bottom of the blade, and then click OK to attach it as a data disk.

<input type="text" value="Search blobs by prefix (case-sensitive)"/>	
NAME	SIZE
 DataDisk.vhd	50 MB

9. Login to the **WebVM-2** virtual machine by clicking the **Connect** button on the toolbar of the virtual machine.
10. From within the virtual machine click the File Explorer icon.

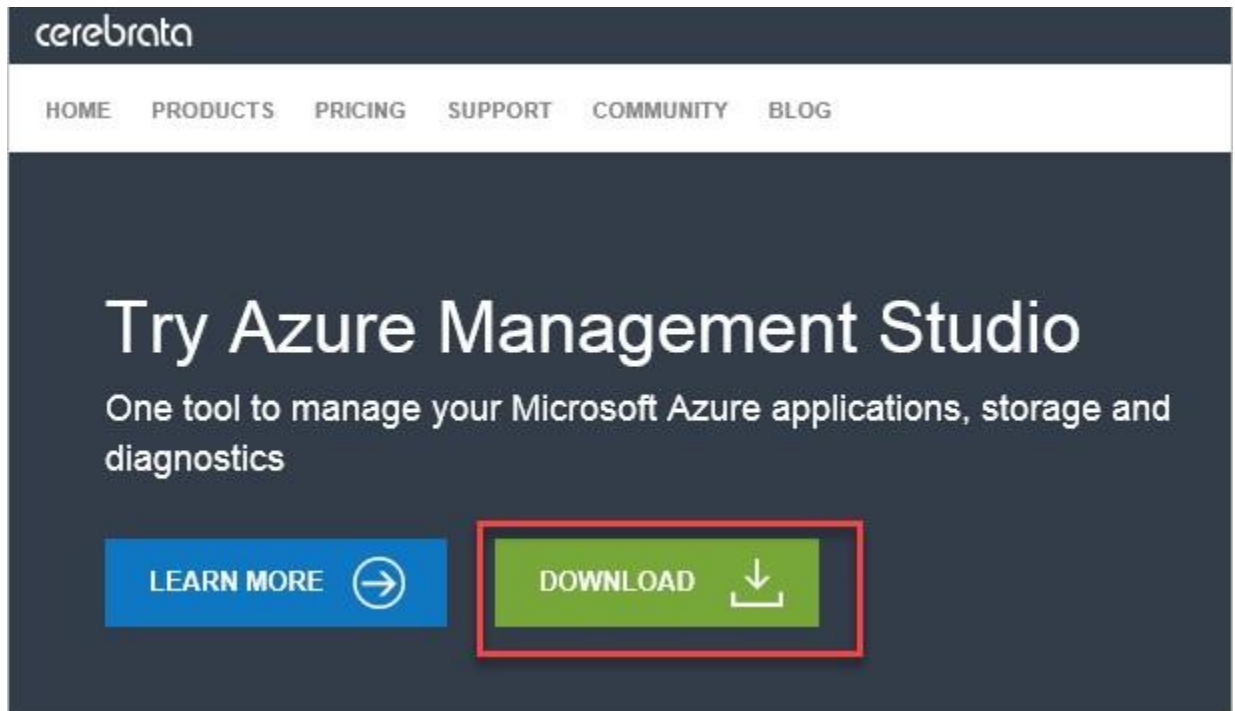


11. Navigate to the F: drive (may be E:) and note the disk is attached with data loaded from the uploaded VHD.

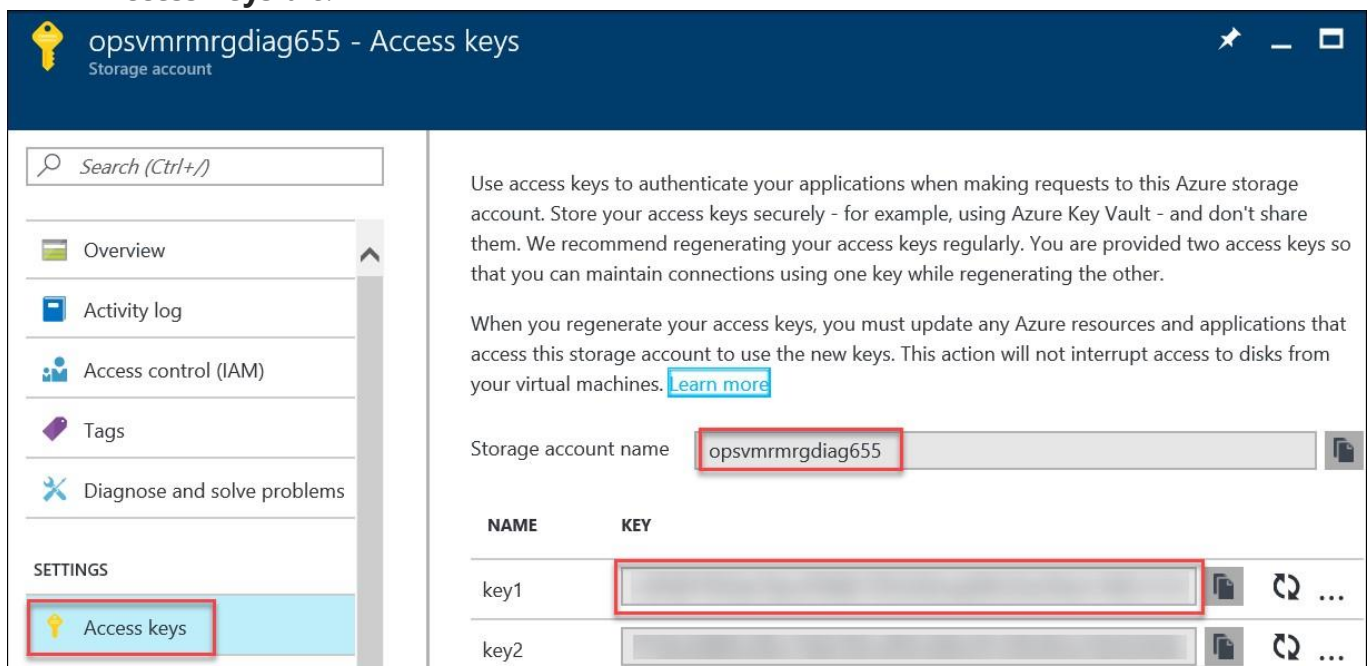


## Exercise 5: Viewing Diagnostics Data

1. The Cerebrata Azure Management Studio (AMS) application can be used to analyze diagnostics data stored in Azure Storage (among other things). From **LABVM** Download and install a trial version of the application here: <http://www.cerebrata.com/>.



2. The AMS application requires the storage account name and the storage account key. Copy the key by launching the Azure Management Portal, click **Browse, Storage Accounts**, and click the storage account with 'diag' in the name, such as 'Infosysvmrgrgdiag655' for example.
3. On the Storage Account blade, note the **storage account name**, and click the **Access keys** tile.

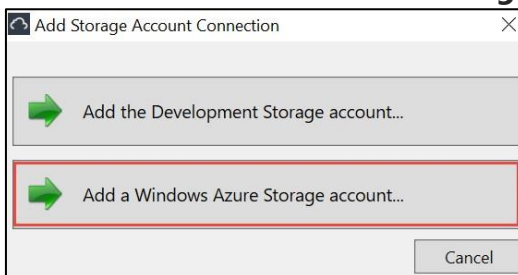


4. Copy the value for **KEY1**.

5. Within the AMS application, click **Add Storage Account Connection**.



6. Click **Add a Windows Azure Storage account**.



7. Add the **Storage Account name**, and the **Storage Account Key** to the dialog and click **OK**.

**Add Storage Account Connection**

Storage Account name: opsvmmrgdiag272

Storage Account Key: .....

Endpoint Domain: ☒ Default ☐ China ☐ US Gov ☐ Custom  
core.windows.net

Account type: Standard Local Redundant

Account kind: Storage

Connect automatically: ☐

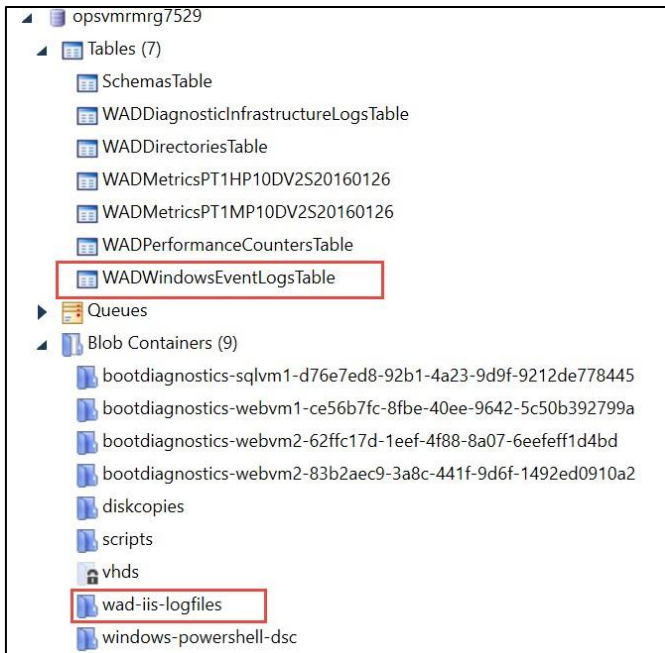
Use SSL: ☒

Use readonly secondary endpoint: ☐

Connection Group: My Connection Group

< Previous OK Cancel

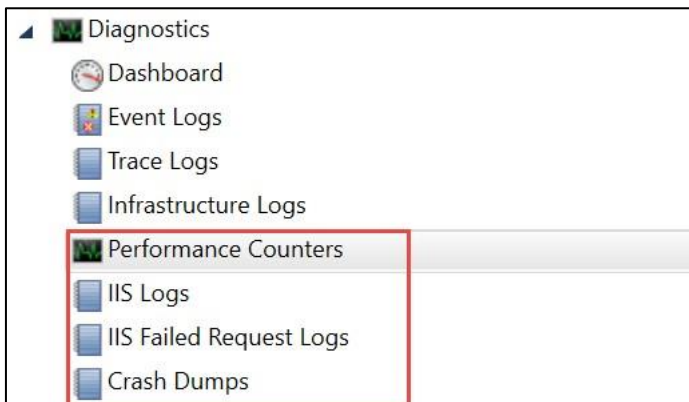
8. Expand the storage account, expand tables and Blob Containers. This is the location of the raw data stored for Azure Diagnostics. The WADWindowsEventLogsTable can be queried to view the event logs from the VM. The WADMetric\* tables contain the captured performance counters in their raw form. The wad-iis-logfiles container (under Blob Containers) stores the IIS log files, and if configured through the XML configuration additional log files could be captured and stored in blob storage as well.



9. After the next synchronization (within an hour) you will see a new container created named **wad-iis-logfiles**.

**Note:** If the log files are not synchronized yet, you can revisit this step later.

10. If configured through XML you can capture Crash Dumps, and IIS Failed Request Logs. In this example you should be able to view the IIS Logs and Performance counters.



## Lab Summary

In this lab, you learned how to attach additional storage from the Azure Management Portal and manage the underlying storage using Azure Storage Explorer.