**Module 3: Integrating with Azure Compute Services**

**Lab A: Uploading an on-premises virtual disk file to Azure**

**Exercise 1: Preparing for an upload of a virtual disk file to Azure**

**Task 1: Create an Azure storage account**

1. On THE host computer, start Internet Explorer.
2. In Internet Explorer, browse to the Azure portal at <http://portal.azure.us>
3. When prompted, sign in by using the Microsoft account that is the Service Administrator of your Azure subscription.
4. In the Azure portal, in the hub menu on the left-hand side, click **+ Create a resource**.
5. On the **New** blade, click **Storage** and then click **Storage account - blob, file, table, queue**.
6. On the **Create storage account** blade, specify the following settings, and then click **Create**:
   1. Name: a unique name between 3 and 24 characters in length, which can include lowercase letters and digits
   2. Deployment model: **Resource Manager**
   3. Account kind: **Storage (general purpose v1)**
   4. Performance: **Standard**
   5. Replication: **Locally-redundant storage (LRS)**
   6. Secure tansfer required: **Disabled**
   7. Subscription: the name of your Azure subscription
   8. Resource group: ensure that the **Create new** option is selected, and then type **wingovm3aXX-LabRG**
   9. Location: any Azure region where you can create a storage account
   10. Configure virtual networks: **Disabled**
   11. Pin to dashboard: leave unchecked
7. Do not wait until the storage account is created, but proceed to the next task.

**Task 2: Create a VHDX virtual disk**

1. On THE HOST COMPUTER, right-click **Start** and, in the right-click menu, click **Computer Management**.
2. In the **Computer Management** console, click **Disk Management**.
3. Click the **Action** menu, and then on the menu, click **Create VHD**.
4. In the **Create and Attach Virtual Hard Disk** dialog box, specify the following settings and then click **OK**:
   1. Location: **C:\datadisk01.vhdx**
   2. Virtual hard disk size: **1 GB**
   3. Virtual hard disk format: **VHDX**
   4. Virtual hard disk type: **Dynamically expanding**
5. Right-click the newly created disk and, in the menu, click **Detach VHD**.
6. In the **Detach Virtual Hard Disk** dialog box, click **OK**.
7. Close **Computer Management**.

**Task 3: Convert the VHDX virtual disk to the VHD format**

1. On THE HOST COMPUTER, click **Start**, right-click **Windows PowerShell**, in the right-click menu, click **More**, and then click **Run as administrator**.
2. At the **Administrator: Windows PowerShell** prompt, to create a variable containing the name of the data disk, type the following and then press Enter:

$diskName = 'datadisk01'

1. At the **Administrator: Windows PowerShell** prompt, to convert the disk format from VHDX to VHD, type the following and then press Enter:

Convert-VHD -Path "C:$diskName.vhdx" -DestinationPath "c:\$diskName.vhd"

1. Wait until the conversion completes. This should take a few seconds

**Result**: After you completed this exercise, you should have successfully created an Azure storage account, created a fixed .vhdx virtual disk file, and converted it to the VHD format.

**Exercise 2: Uploading a virtual disk file to Azure**

**Task 1: Upload the .vhd file to the Azure storage account**

1. On THE HOST COMPUTER, at the **Administrator: Windows PowerShell** prompt, type the following, and then press Enter.

Add-AzureRmAccount -EnvironmentName AzureUSGovernment

1. When prompted, sign in by using the Microsoft account that is the Service Administrator of your Azure subscription.
2. If you have multiple subscriptions, then at the **Administrator: Windows PowerShell** prompt, type the following cmdlet, (replace <subscription\_name> with the name of your Azure subscription), and then press Enter:

Select-AzureRmSubscription -SubscriptionName '<subscription\_name>'

1. To create a variable referencing the storage account you created in the first exercise of this lab, at the **Administrator: Windows PowerShell** prompt, type the following cmdlet, and then press Enter:

$storageAccount = Get-AzureRmStorageAccount -ResourceGroupName 'wingovm3aXX-LabRG'

1. To upload the .vhd file to the storage account you created in the previous exercise, at the **Administrator: Windows PowerShell** prompt, type the following cmdlet, and then press Enter:

Add-AzureRmVhd -ResourceGroupName $storageAccount.ResourceGroupName -Destination "$($storageAccount.PrimaryEndpoints.Blob)vhds/$diskName.vhd" -LocalFilePath "C:\$diskName.vhd"

**Note:** Because the **Add-AzureRmVhd** cmdlet copies only the content of the VHD file that is in use, the upload should take a few seconds. In addition, the cmdlet automatically converts the dynamically expanding disk into the fixed format.

**Task 2: Convert an uploaded .vhd file into a managed data disk**

1. To define the managed disk configuration, at the **Administrator: Windows PowerShell** prompt, type the following, and then press Enter.

$diskConfig = New-AzureRmDiskConfig -AccountType 'StandardLRS' -Location $storageAccount.Location -CreateOption Import -StorageAccountId $storageAccount.id -SourceUri "$($storageAccount.PrimaryEndpoints.Blob)vhds/$diskName.vhd"

1. To convert the uploaded .vhd file into a managed disk, at the **Administrator: Windows PowerShell** prompt, type the following, and then press Enter.

New-AzureRmDisk -Disk $diskConfig -ResourceGroupName $storageAccount.ResourceGroupName -DiskName $diskName

**Task 3: Provision an Azure VM**

1. On THE HOST COMPUTER, start Internet Explorer.
2. In Internet Explorer, browse to the Azure portal at [http://portal.azure.us](http://portal.azure.com/)
3. When prompted, sign in by using the Microsoft account that is the Service Administrator of your Azure subscription.
4. In the Azure portal, in the hub menu on the left hand side, click **+ Create a resource**.
5. On the **New** blade, click **Compute**.
6. On the **Compute** blade, click **Ubuntu Server 16.04 LTS**.
7. On the **Basics** blade, specify the following settings, and then click **OK**:
   1. Name: **wingovm3aXX-vm1**
   2. VM disk type: **HDD**
   3. User name: **student**
   4. Authentication type: **Password**
   5. Password: **Pa55w.rd1234**
   6. Confirm password: **Pa55w.rd1234**
   7. Subscription: select the name of the Azure subscription where you created the storage account in the first exercise of this lab
   8. Resource group: click **Use existing** and select **wingovm3aXX-LabRG** in the drop-down list
   9. Location: select the name of an Azure region where you created the storage account in the first exercise of this lab
8. On the **Choose a size** blade, click **View all**.
9. On the **Choose a size** blade, click one of available, low-priced VM sizes and then click **Select**.
10. On the **Settings** blade, specify the following settings, and then click **OK**:
    1. Availability set: **None**
    2. Use managed disks: **Yes**
    3. Virtual network: accept the default value, which creates a new virtual network
    4. Subnet: accept the default setting, which creates a new subnet named **default**
    5. Public IP address: accept the default value, which will create a new public IP address
    6. Network security group: accept the default value, which will create a new network security group allowing connectivity via SSH
    7. Extensions: **No extensions**
    8. Enable auto-shutdown: **Off**
    9. Boot diagnostics: **Disabled**
    10. Guest OS diagnostics: **Disabled**
11. On the **Summary** blade, click **Create**.
12. Wait for the deployment to complete.

**Task 4: Attach a managed data disk to an Azure VM**

1. In the Azure portal, on the hub menu, click **Resource Groups**.
2. On the **Resource Groups** blade, click **wingovm3aXX-LabRG**.
3. On the **wingovm3aXX-LabRG** blade, click **wingovm3aXX-vm1**.
4. On the **wingovm3aXX-vm1** blade, click **Disks**.
5. On the **wingovm3aXX-vm1 - Disks** blade, click **+ Add data disk**.
6. In the NAME drop-down list, click **datadisk01**, leave **HOST CACHING** entry with the default value of **None**, and click **Save**.
7. Wait until the disk is successfully attached to the Azure VM.

**Task 5: Identify and delete all the Azure resources used in the lab**

1. In the Azure portal, on the hub menu, click **Resource Groups**.
2. On the **Resource Groups** blade, click **wingovm3aXX-LabRG**.
3. On the **wingovm3aXX-LabRG** blade, click **Delete resource group**.
4. On the **Are you sure you want to delete "wingovm3aXX-LabRG"?** blade, in the **TYPE THE RESOURCE GROUP NAME** box, type **wingovm3aXX-LabRG** and then click **Delete**.
5. Close all open windows.

**Result**: After you completed this exercise, you should have successfully uploaded the .vhd file to an Azure storage account. After the upload completes, you should have converted the uploaded .vhd file into a managed disk. Next, you should have deployed an Azure Linux VM and attached the managed disk to it as its data disk. Finally, you should have identified and removed all of the Azure resources that you created for this lab by using the Azure portal.