

ASSIGNMENT ONE: MANAGE VIRTUAL MACHINES

WRITEUP

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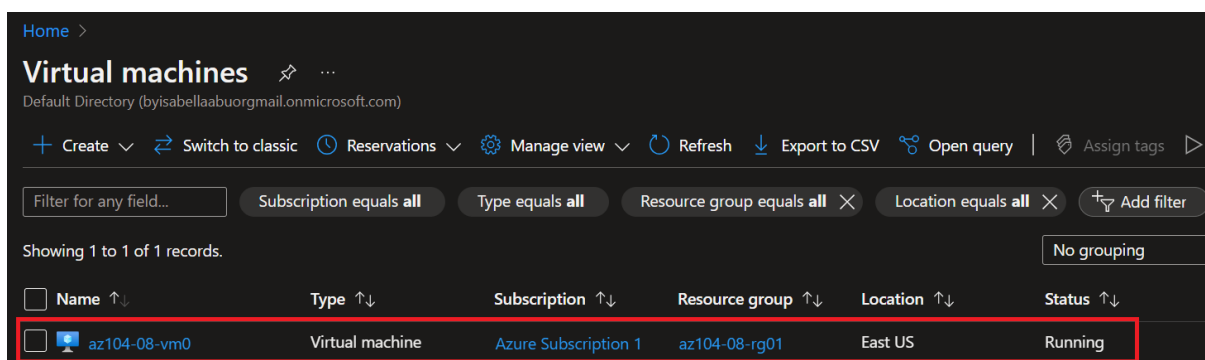
Introduction

In this assignment, it focused on deploying and configuring Azure virtual machines and scale sets. It was divided into 7 tasks in which the first 2 focused on how to deploy zone-resilient Azure virtual machines by using the Azure portal and an Azure Resource Manager template and how to configure Azure virtual machines by using virtual machine extensions. The rest of the tasks focused on how to Scale compute and storage for Azure virtual machines. The following is a detailed description of the tasks provided to manage virtual machines.

Task 1: Deploy zone-resilient Azure virtual machines by using the Azure portal and an Azure Resource Manager template

In this task, deployment of Azure virtual machines into different availability zones by using the Azure portal and an Azure Resource Manager template was done.

After signing into the azure portal and in the virtual machines blade and created a new Azure virtual machine with specific settings. The following diagram represents the created virtual machine.

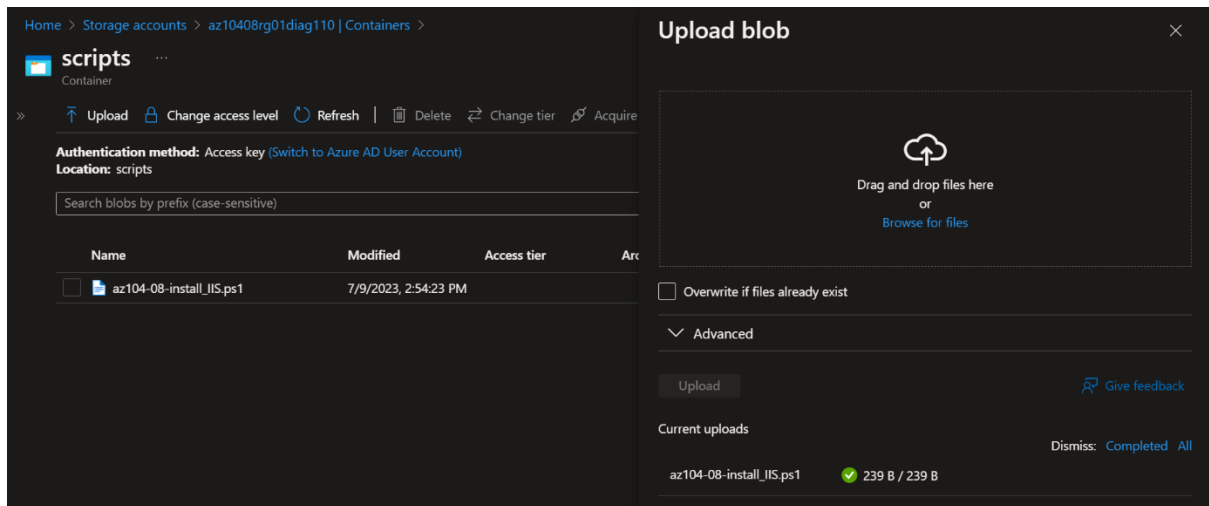


Name	Type	Subscription	Resource group	Location	Status
az104-08-vm0	Virtual machine	Azure Subscription 1	az104-08-rg01	East US	Running

Task 2: Configure Azure virtual machines by using virtual machine extensions

In this task, we installed the Windows Server Web Server role on the two Azure virtual machines you deployed in the previous task by using the Custom Script virtual machine extension. The following represents the step-by-step process used to complete the task.

In the first step, In the Azure portal, we searched for and selected the entry representing the diagnostics storage account you created in the task one. We then created a new container named scripts and clicked on the container created and uploaded az104-08-install_IIS.ps1 as shown in the diagram below:

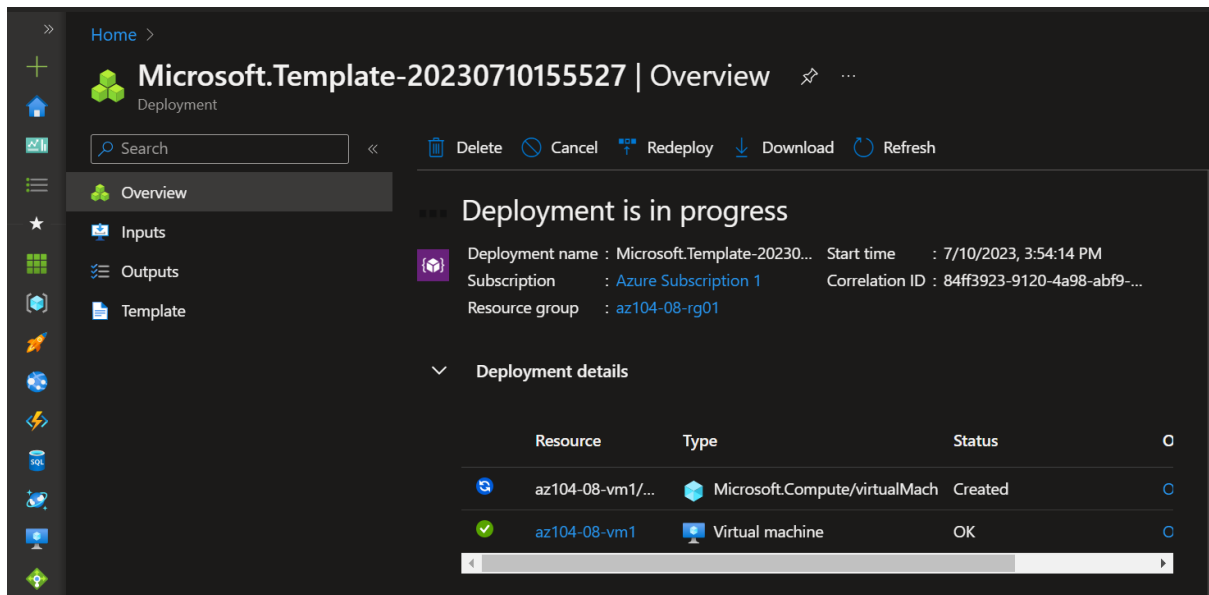


In the next step we created a custom script extension and configured it adding the az104-08-install_IIS.ps1 file on the first virtual machine we created (az104-08-vm0)

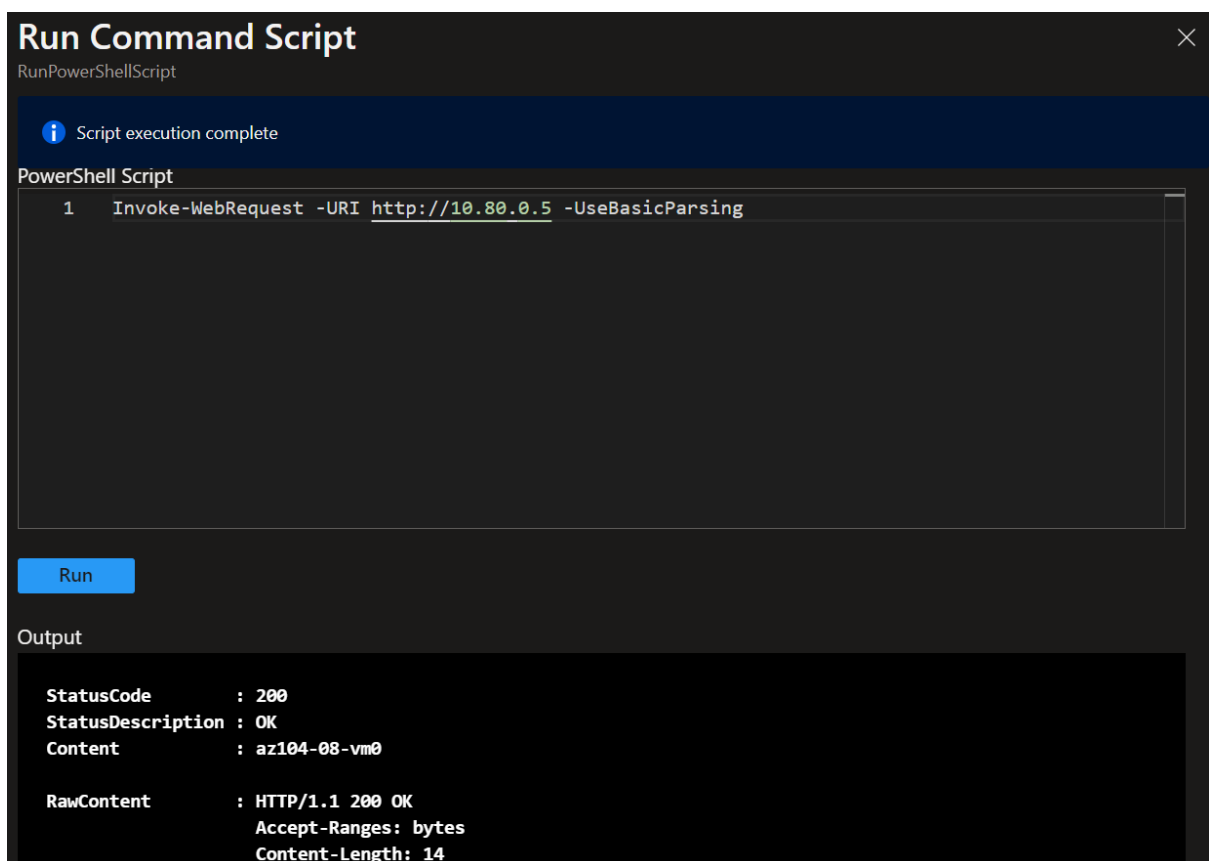
We then edited the template on vm1 virtual machine adding the following code on line 20 and deployed it.

```
Code Copy
```

```
{
  "type": "Microsoft.Compute/virtualMachines/extensions",
  "name": "az104-08-vm1/customScriptExtension",
  "apiVersion": "2018-06-01",
  "location": "[resourceGroup().location]",
  "dependsOn": [
    "az104-08-vm1"
  ],
  "properties": {
    "publisher": "Microsoft.Compute",
    "type": "CustomScriptExtension",
    "typeHandlerVersion": "1.7",
    "autoUpgradeMinorVersion": true,
    "settings": {
      "commandToExecute": "powershell.exe Install-WindowsFeature -name Web-Server
-IncludeManagementTools && powershell.exe remove-item 'C:\\inetpub\\wwwroot\\iisstart.htm'
&& powershell.exe Add-Content -Path 'C:\\inetpub\\wwwroot\\iisstart.htm' -Value $('Hello
World from ' + $env:computername)"
    }
  }
},
```



Finally, to verify that the Custom Script extension-based configuration was successful, on the az104-08-vm1 blade, in the Operations section, we clicked on RunPowerShellScript command on the Run command section as shown in the diagram below:



Task 3: Scale compute and storage for Azure virtual machines

In this task, we scaled compute for Azure virtual machines by changing their size and scale their storage by attaching and configuring their data disks.

In the first step, in the size section on the virtual machine(**az104-08-vm0**) we resized the machine from DS2_v3 to **Standard DS1_v2** as shown below.

We then created and attached a new disk on the disk section under the Data disks and changed the disks storage size to 1024 as shown below:

az104-08-vm0 | Disks ☆ ...
Virtual machine

» Save Discard Refresh | Additional settings Feedback Troubleshoot

OS disk

↔ Swap OS disk

Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...)	Encryption ⓘ
az104-08-vm0_OsDisk_1_fd49202	Premium SSD LRS	127	500	100	SSE with PMK

Data disks

🔍 Filter by name

Showing 2 of 2 attached data disks

+ Create and attach a new disk Attach existing disks

LUN ⓘ	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput
0	az104-08-vm0-datadisk-0 ✓	Premium SSD (loc... ✓	1024 ✓	5000	200
1	az104-08-vm0-datadisk-1 ✓	Premium SSD (loc... ✓	1024 ✓	5000	200

Then on the **Operations** section, clicked the **Run command**, and, in the list of commands, click **RunPowerShellScript** and prompted the command to create a drive Z consisting of the two newly attached disks as shown below:

```
PowerShell Script
1 New-StoragePool -FriendlyName storagepool1 -StorageSubsystemFriendlyName "Windows Storage*" -Ph
2
3 New-VirtualDisk -StoragePoolFriendlyName storagepool1 -FriendlyName virtualdisk1 -Size 64GB -Re
4
5 Initialize-Disk -VirtualDisk (Get-VirtualDisk -FriendlyName virtualdisk1)
6
7 New-Partition -DiskNumber 4 -UseMaximumSize -DriveLetter Z

Run

Output

DiskNumber      : 4
DriveLetter     : Z
GptType         : {ebd0a0a2-b9e5-4433-87c0-68b6b72699c7}
Guid            : {3f9663ab-4ec5-435a-b826-0272a56cfe26}
IsActive        : False
IsBoot          : False
IsDAX           : False
IsHidden        : False
```

On other virtual machine that we created **az104-08-vm1** in the **Automation** section, we edited the template in line 30 to add the following code:

```
"vmSize": "Standard_DS1_v2"
```

And on line 50 on the **datadisks** line added the two created data disks.

To verify that the disks were added, on the **az104-08-vm1** blade, in the **Operations** section, we clicked on **Run command** section, and, in the list of commands, click **RunPowerShellScript** and prompted the following code:

Dashboard > az104-08-vm1

az104-08-vm1 | Run command

Virtual machine

Now it's possible to execute multiple scripts at the same time. Learn more about the updated Run Command feature.

Run Command uses the VM agent to let you run a script on a virtual machine and application maintenance. Select a command.

Name

- RunPowerShellScript
- DisableNLA
- DisableWindowsUpdate
- EnableAdminAccount
- EnableEMS
- EnableRemotePS
- EnableWindowsUpdate
- IPConfig
- RDPSettings
- ResetRDPcert
- SetRDPport

Run Command Script

RunPowerShellScript

Script execution complete

PowerShell Script

```
1 New-StoragePool -FriendlyName storagepool1 -StorageSubsystemFriendlyName "Windows Storage*" -Ph
2
3 New-VirtualDisk -StoragePoolFriendlyName storagepool1 -FriendlyName virtualdisk1 -Size 2046GB -Re
4
5 Initialize-Disk -VirtualDisk (Get-VirtualDisk -FriendlyName virtualdisk1)
6
7 New-Partition -DiskNumber 4 -UseMaximumSize -DriveLetter Z
```

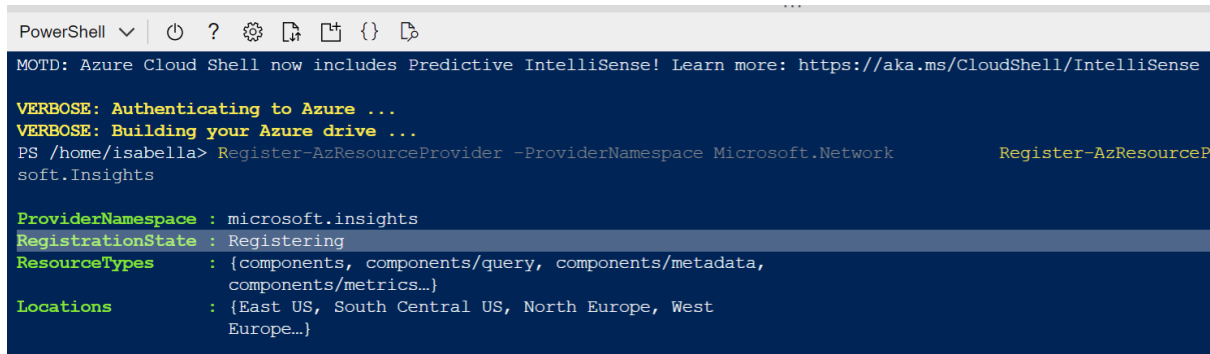
Run

Output

```
DiskNumber      : 4
DriveLetter     : Z
GptType         : {ebd0a0a2-b9e5-4433-87c0-68b6b72699c7}
Guid            : {3aaef4a7-c83e-444c-8064-78a2d4b1a0c3}
IsActive        : False
IsBoot          : False
IsDAX           : False
IsHidden        : False
```

Task 4: Register the Microsoft.Insights and Microsoft.AlertsManagement resource providers

In this we registered the Microsoft.Insights and Microsoft.AlertsManagement resource providers in the **Azure Cloud Shell in powershell** by run the following code to register the Microsoft.Insights and Microsoft.AlertsManagement resource providers.

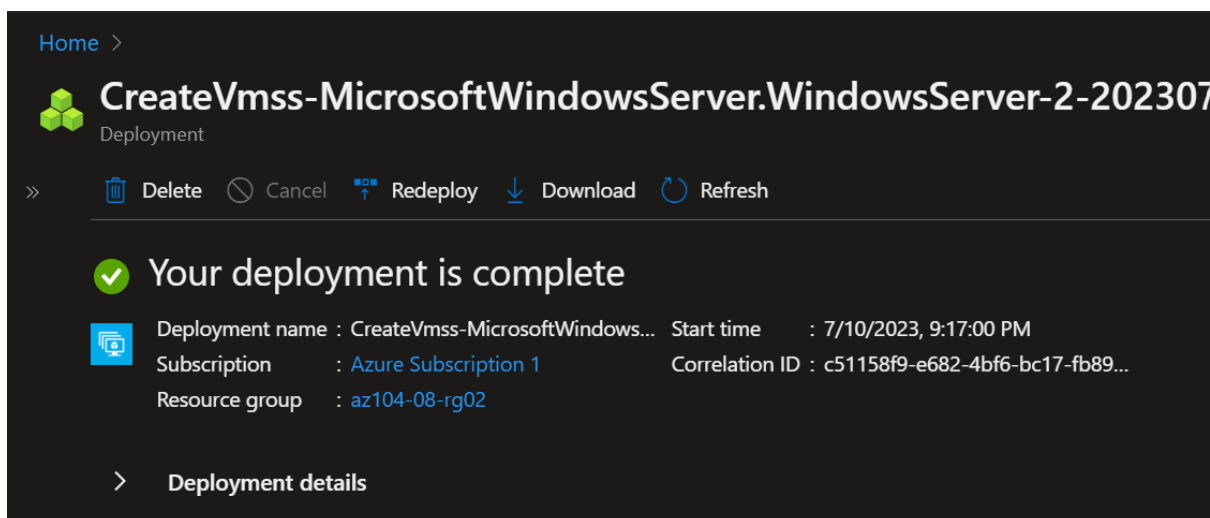


```
PowerShell
MOTD: Azure Cloud Shell now includes Predictive IntelliSense! Learn more: https://aka.ms/CloudShell/IntelliSense
VERBOSE: Authenticating to Azure ...
VERBOSE: Building your Azure drive ...
PS /home/isabella> Register-AzResourceProvider -ProviderNamespace Microsoft.Network -Register-AzResourceP
soft.Insights

ProviderNamespace : microsoft.insights
RegistrationState  : Registering
ResourceTypes     : {components, components/query, components/metadata,
                    components/metrics...}
Locations         : {East US, South Central US, North Europe, West
                    Europe...}
```

Task 5: Deploy zone-resilient Azure virtual machine scale sets by using the Azure portal

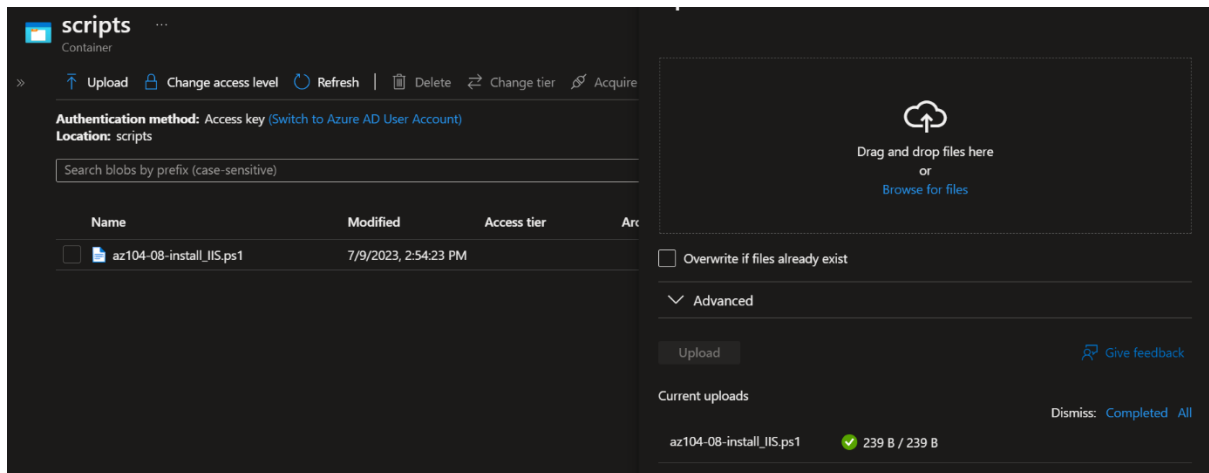
In this task, we deployed Azure virtual machine scale set across availability zones by selecting Virtual machine scale sets on the azure portal and creating or adding the virtual machine scale set, then on the Virtual machine scale sets blade we specified the settings like selecting the name, size, availability zone, orchestration mode, configuring network security group by adding inbound rules, scaling options and many more. We then finally deployed the virtual machine scale set as shown the diagram below:



Task 6: Configure Azure virtual machine scale sets by using virtual machine extensions

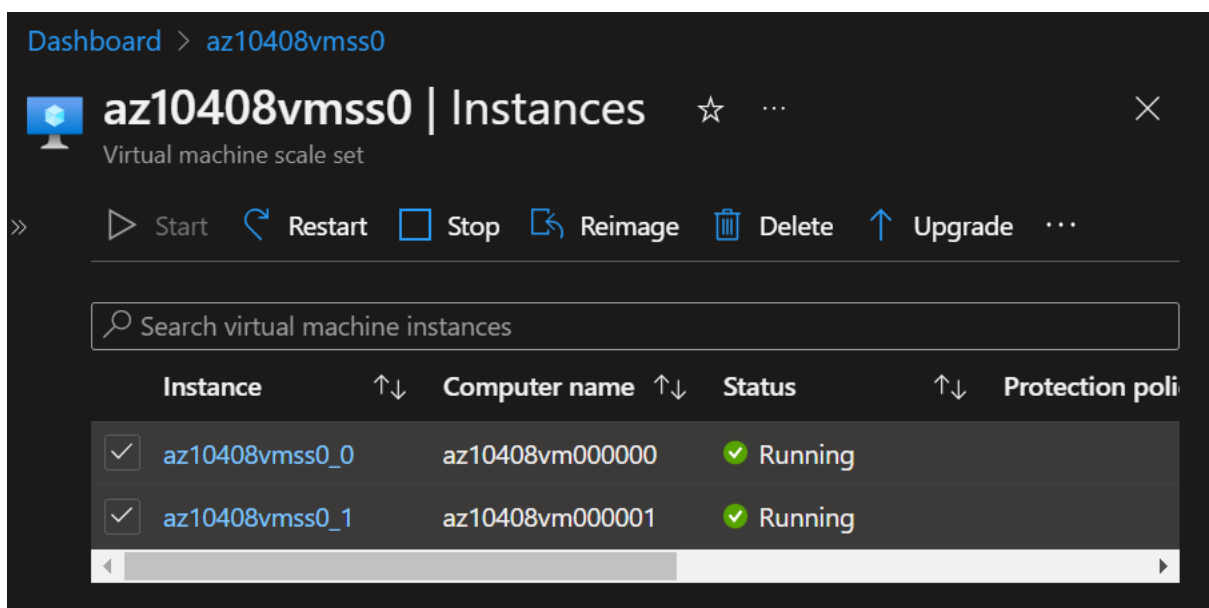
In this task, we installed Windows Server Web Server role on the instances of the Azure virtual machine scale set you deployed in the previous task by using the Custom Script virtual machine extension.

In the first step, In the Azure portal, we searched for and selected the entry representing the diagnostics storage account you created in the task five. We then created a new container named scripts and clicked on the container created and uploaded az104-08-install_IIS.ps1 as shown in the diagram below:



On the Virtual machine scale sets blade on the az10408vmss we added the file that was uploaded on the scripts container in the above step.

Then in the settings section of the az10408vmss0 blade, we clicked Instances, and selected the checkboxes next to the two instances of the virtual machine scale set and clicked Upgrade, and then, when prompted for confirmation, click Yes as shown below:



Task 7: Scale compute and storage for Azure virtual machine scale sets

In this task, you will change the size of virtual machine scale set instances, configure their autoscaling settings, and attach disks to them.

To change the size, we navigated to the Virtual machine scale sets and selected the az10408vmss0 scale set and then on the settings section selected size to change the size to Standard DS1_v2 and clicked Resize as shown in the diagram below:

Dashboard > az10408vmss0

az10408vmss0 | Size

Virtual machine scale set

Search by VM size... vCPUs: All RAM (GiB): All Display cost: Monthly Add filter

Showing 339 VM sizes. Subscription: Azure Subscription 1 Region: South Africa North Current size: Standard_DS1_v2 Learn more about VM sizes Group by series

VM Size	Type	vCPUs	RAM (GiB)	Data disks	Max IOPS	Temp storage
Most used by Azure users						
DS1_v2	General purpose	1	3.5	4	3200	7
D2s_v3	General purpose	2	8	4	3200	16
B2s	General purpose	2	4	4	1280	8
B1s (free services)	General purpose	1	1	2	320	4
B2ms	General purpose	2	8	4	1920	16
DS2_v2	General purpose	2	7	8	6400	14
D-Series v5: The latest generation D family sizes recommended for your general purpose needs						
D-Series v4: The 4th generation D family sizes for your general purpose needs						

Prices presented are estimates in USD that include only Azure infrastructure costs and any discounts for the subscription and location. The prices don't include any applicable software costs. Final charges will appear in your local currency in cost analysis and billing views. View Azure pricing calculator.

To scale we navigated to the az10408vmss0 - Instances blade, and in the Settings section, clicked Scaling in the Custom autoscale option and configure autoscale with the specific settings adding a rule.

Then on the Azure Cloud Shell on powershell we prompted the following to identify the public IP address of the load balancer in front of the Azure virtual machine scale set az10408vmss0 as shown below:

```
PowerShell
Type "help" to learn about Cloud Shell

MOTD: SqlServer has been updated to Version 22!

VERBOSE: Authenticating to Azure ...
VERBOSE: Building your Azure drive ...
PS /home/isabella> $rgName = 'az104-08-rg02'
PS /home/isabella> $lbpipName = 'az10408vmss0-lb-publicip'
PS /home/isabella> $pip = (Get-AzPublicIpAddress -ResourceGroupName $rgName -Name $lbpipName).IpAddress
PS /home/isabella> while ($true) { Invoke-WebRequest -Uri "http://$pip" }
```

A third instance will be formed after in the instances section.

We then created and attached a new disk on the az10408vmss0 with specific settings. After that, in the Settings section of the az10408vmss0 blade, we uninstalled the CustomScriptExtension on the Extensions and applications section.

Conclusion

In conclusion, this lab assignment has provided you with a comprehensive hands-on experience in deploying and configuring Azure virtual machines and scale sets. Completing this assignment took longer than the expected 50 minutes but with the help team members and other writeup enable me to complete the lab assignment. The insights gained from this lab assignment were highly valuable as I continue to work with Azure and cloud environments. Understanding the concepts of zone resilience, resource providers, virtual machine scale sets, and their associated features and benefits empowered me to be confident in working cloud environment in the future.