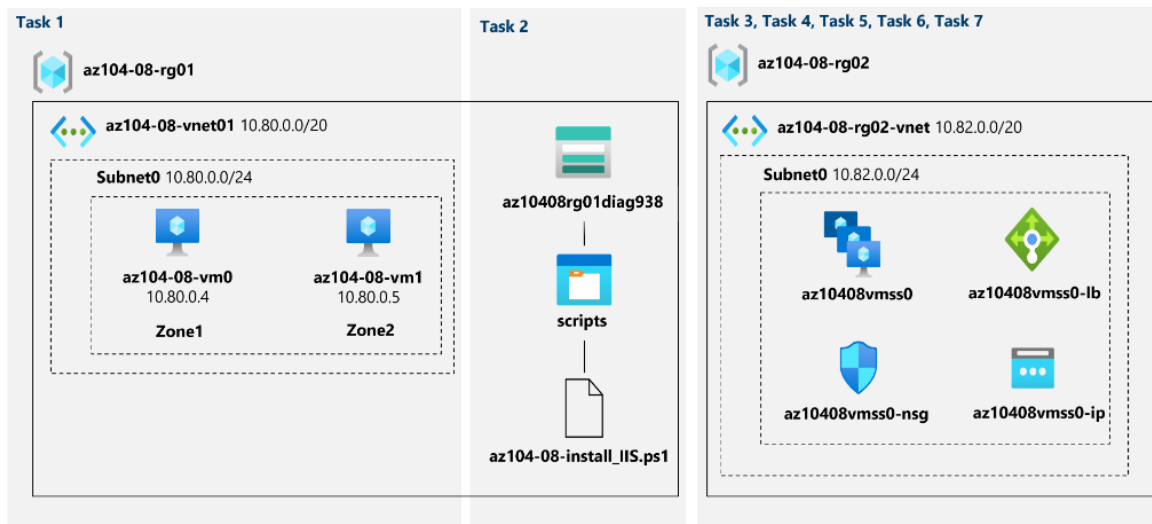


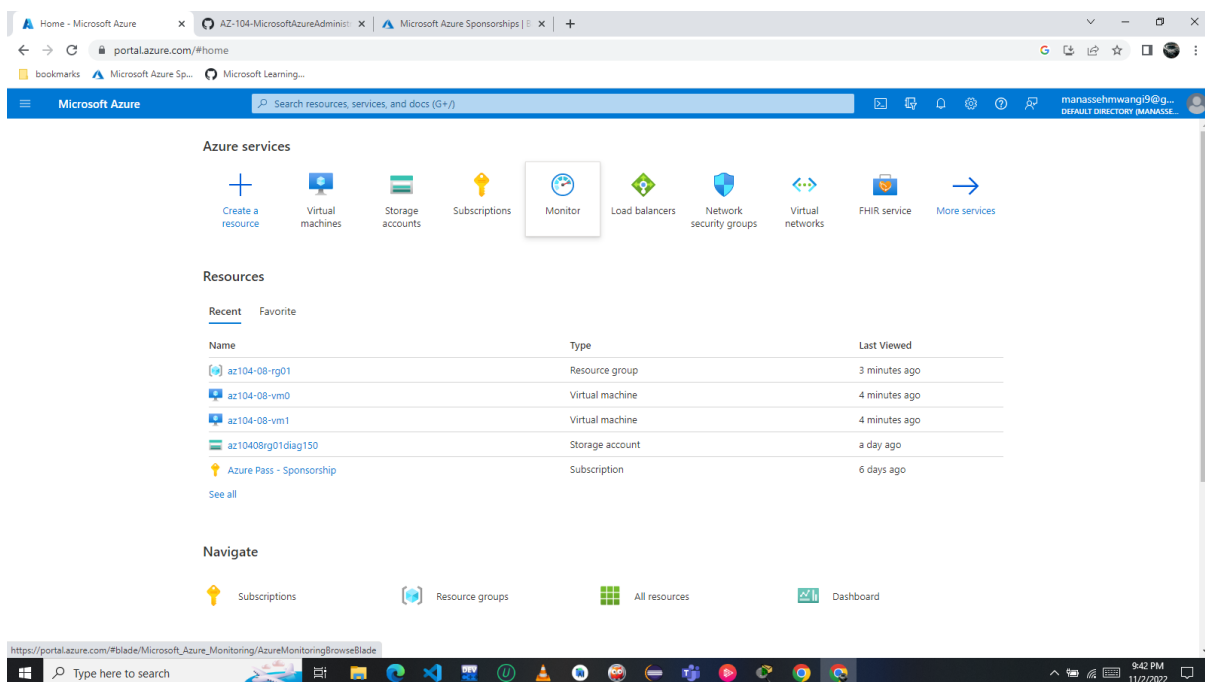
Lab 08 - Manage Virtual Machines

Architecture diagram



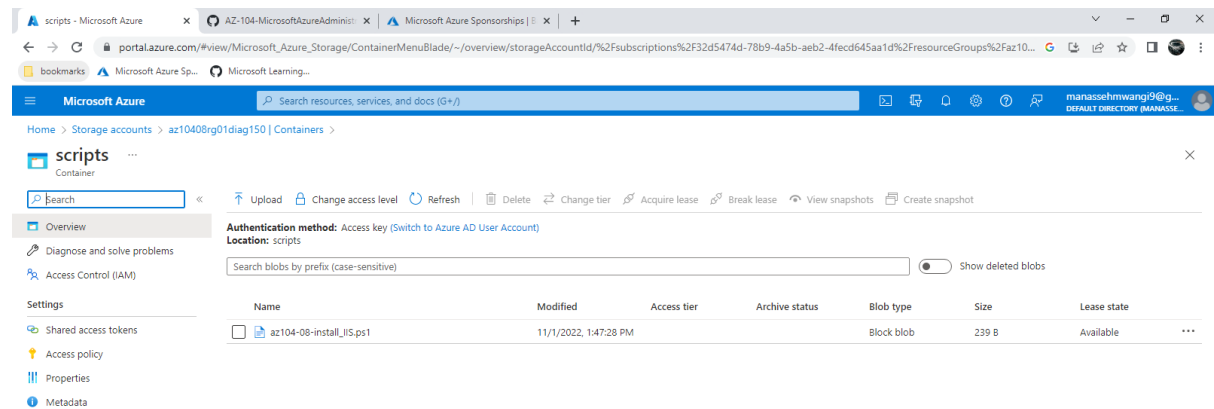
Task 1: Deploy zone-resilient Azure virtual machines by using the Azure portal and an Azure Resource Manager template

Deploying Azure virtual machines into different availability zones by using the Azure portal and an Azure Resource Manager template.



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

On the **New container** blade, specify the following settings **scripts**, **Private (no anonymous access)**

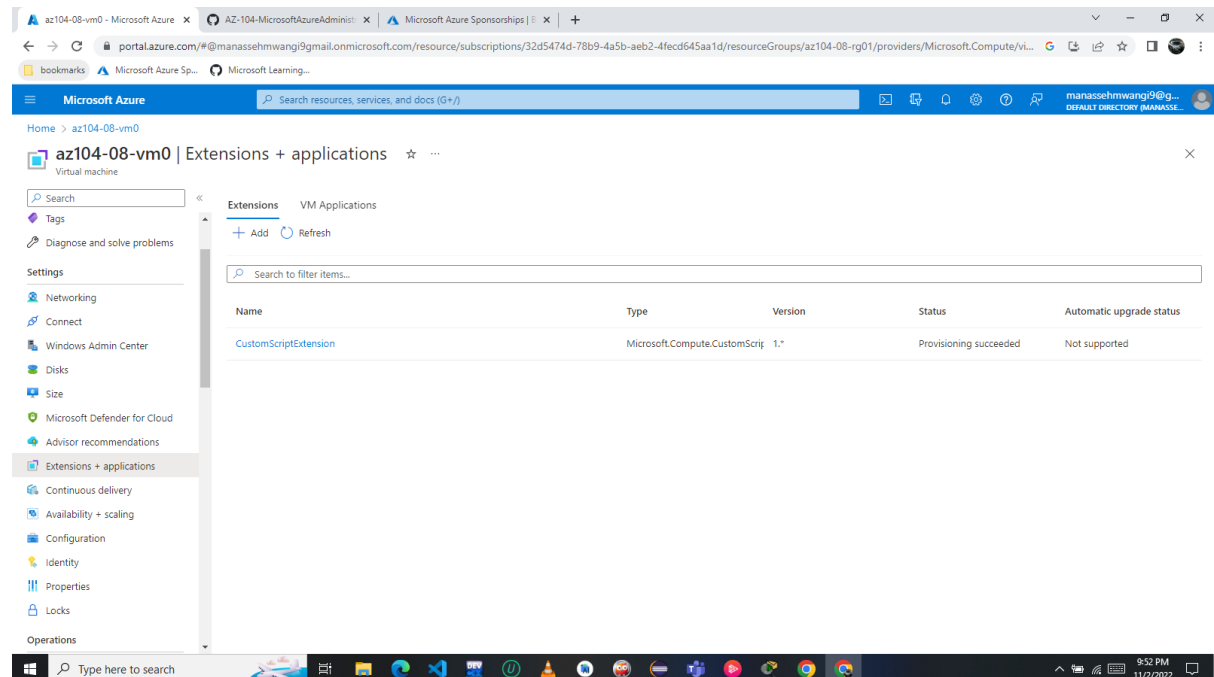


Microsoft Azure portal showing the 'scripts' container blade. The blade displays the 'Overview' tab with a table of blobs. The table has columns: Name, Modified, Access tier, Archive status, Blob type, Size, and Lease state. One blob is listed: 'az104-08-install_IIS.ps1' with a size of 239 B and a lease state of 'Available'.



On the **az104-08-vm0 Configure Custom Script Extension Extension** blade

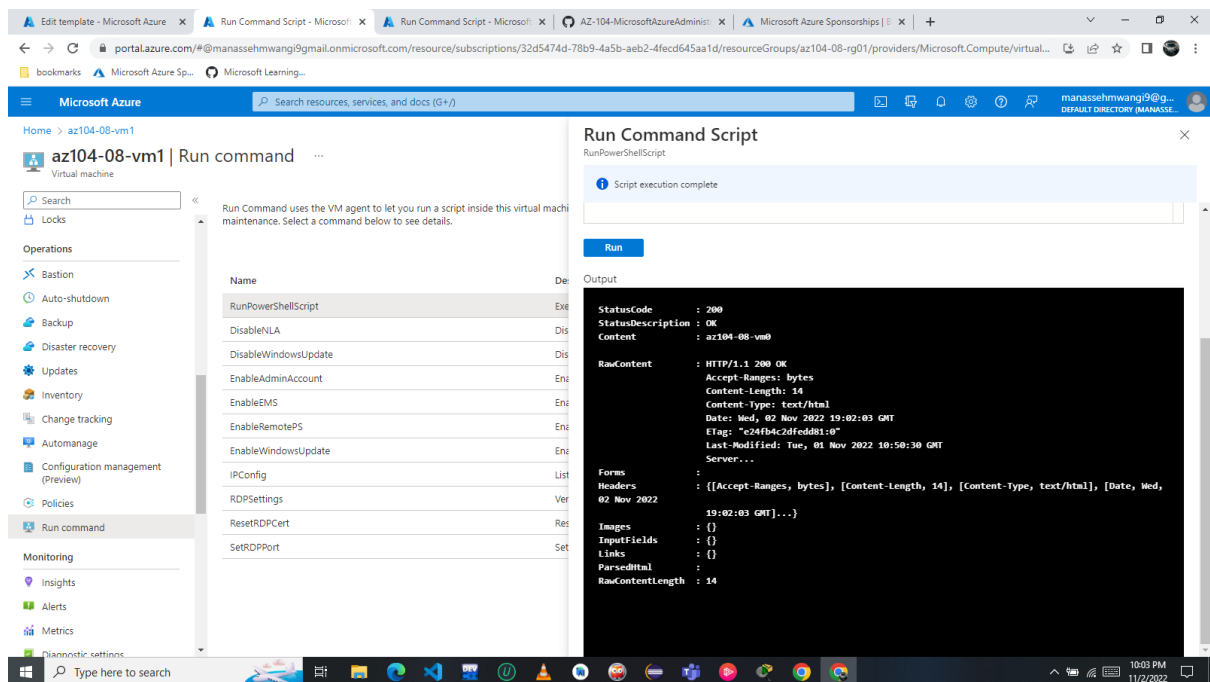
On the **Storage accounts** blade, click the name of the storage account into which you uploaded the **az104-08-install_IIS.ps1** script



Microsoft Azure portal showing the 'az104-08-vm0 | Extensions + applications' blade. The blade displays the 'Extensions' tab with a table of extensions. The table has columns: Name, Type, Version, Status, and Automatic upgrade status. One extension is listed: 'CustomScriptExtension' with a status of 'Provisioning succeeded'.



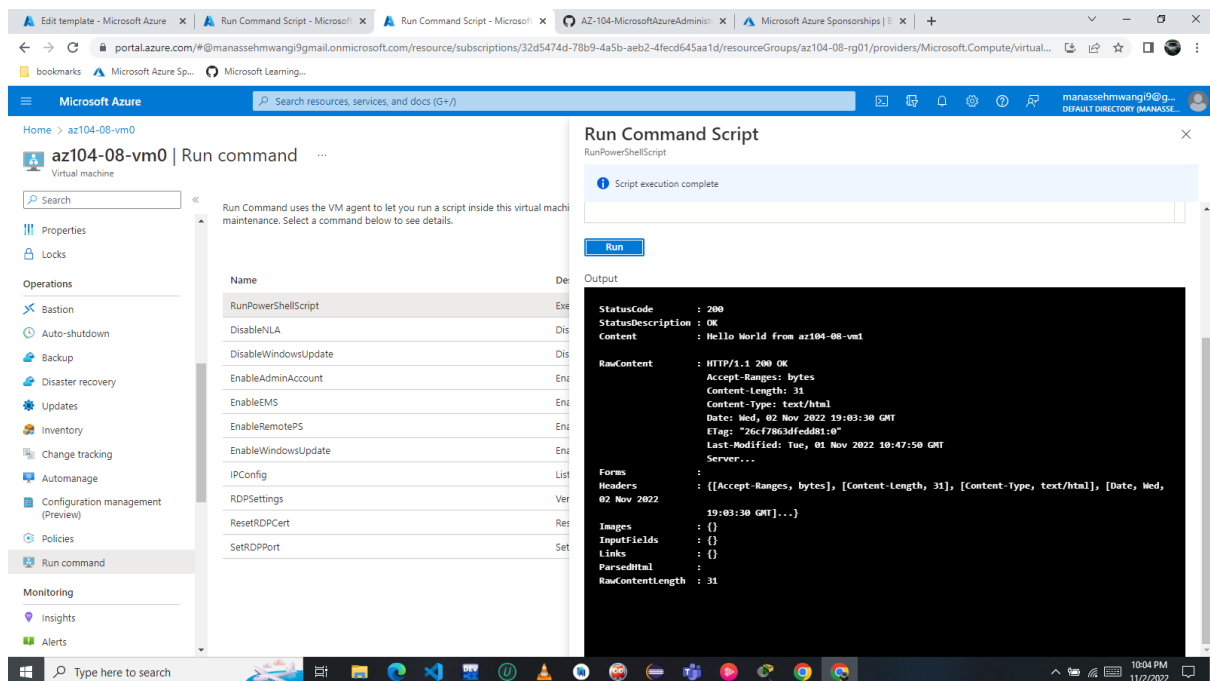
To verify that the Custom Script extension-based configuration was successful, navigate back on the **az104-08-vm1** blade, in the **Operations** section, click **Run command**, and, in the list of commands, click **RunPowerShellScript**.



The screenshot shows the Microsoft Azure portal interface. On the left, the 'Operations' section is expanded, and 'Run command' is selected. The main pane shows the 'Run Command Script' window for the virtual machine 'az104-08-vm1'. The 'RunPowerShellScript' command is selected from the list. The 'Output' tab is active, displaying the following JSON response:

```
{
  "StatusCode": 200,
  "StatusDescription": "OK",
  "Content": "az104-08-vm0",
  "RawContent": "HTTP/1.1 200 OK\r\nAccept-Ranges: bytes\r\nContent-Length: 14\r\nContent-Type: text/html\r\nDate: Wed, 02 Nov 2022 19:02:03 GMT\r\nETag: \"c24fb4c2dfedd81:0\"\r\nLast-Modified: Tue, 01 Nov 2022 10:50:30 GMT\r\nServer: ...",
  "Forms": {},
  "Headers": "[[Accept-Ranges, bytes], [Content-Length, 14], [Content-Type, text/html], [Date, Wed, 02 Nov 2022 19:02:03 GMT]]",
  "Images": {},
  "InputFields": {},
  "Links": {},
  "ParsedHtml": {},
  "RawContentLength": 14
}
```

You can also connect to **az104-08-vm0** and run `Invoke-WebRequest -URI http://10.80.0.5 -UseBasicParsing` to access the web site hosted on **az104-08-vm1**.



The screenshot shows the Microsoft Azure portal interface. On the left, the 'Operations' section is expanded, and 'Run command' is selected. The main pane shows the 'Run Command Script' window for the virtual machine 'az104-08-vm0'. The 'RunPowerShellScript' command is selected from the list. The 'Output' tab is active, displaying the following JSON response:

```
{
  "StatusCode": 200,
  "StatusDescription": "OK",
  "Content": "Hello World from az104-08-vm1",
  "RawContent": "HTTP/1.1 200 OK\r\nAccept-Ranges: bytes\r\nContent-Length: 31\r\nContent-Type: text/html\r\nDate: Wed, 02 Nov 2022 19:03:30 GMT\r\nETag: \"26cf7863dfedd81:0\"\r\nLast-Modified: Tue, 01 Nov 2022 10:47:50 GMT\r\nServer: ...",
  "Forms": {},
  "Headers": "[[Accept-Ranges, bytes], [Content-length, 31], [Content-Type, text/html], [Date, Wed, 02 Nov 2022 19:03:30 GMT]]",
  "Images": {},
  "InputFields": {},
  "Links": {},
  "ParsedHtml": {},
  "RawContentLength": 31
}
```

Task 3: Scale compute and storage for Azure virtual machines

On the az104-08-vm0 virtual machine blade create and attach a new disks

The screenshot shows the 'Disks' tab for the virtual machine 'az104-08-vm0'. The page displays the OS disk and two attached data disks. The OS disk is 'az104-08-vm0_disk1_1e52319f4af442e4963' with a size of 127 GiB. The two data disks are 'az104-08-vm0-datatdisk-0' and 'az104-08-vm0-datatdisk-1', both with a size of 1024 GiB. The interface includes a left sidebar with navigation options like Overview, Activity log, Access control, and Settings. The top bar shows the user's profile and search functionality.

On the **az104-08-vm0** blade **Run Command Script** to create a drive Z: consisting of the two newly attached disks with the simple layout and fixed provisioning:

The screenshot shows the 'Run Command Script' blade for the virtual machine 'az104-08-vm0'. The blade displays a list of commands to run, including 'RunPowerShellScript', 'DisableNLA', 'DisableWindowsUpdate', 'EnableAdminAccount', 'EnableEMS', 'EnableRemotePS', 'EnableWindowsUpdate', 'IPConfig', 'RDPSettings', 'ResetRDPcert', and 'SetRDPport'. The 'RunPowerShellScript' command is selected, and its output is displayed in a terminal window. The output shows the disk details for the newly created drive Z:.

This section of the template creates two managed disks and attaches them to **az104-08-vm1**, similarly to the storage configuration of the first virtual machine via the Azure portal.

Home > Microsoft.Template-20221102223132 | Overview

Deployment

Search resources, services, and docs (G+)

Overview

Inputs

Outputs

Template

✓ Your deployment is complete

Deployment name: Microsoft.Template-20221102223132
Subscription: Azure Pass - Sponsorship
Resource group: az104-08-rg01

Start time: 11/2/2022, 10:31:39 PM
Correlation ID: c626346c-2e91-4101-aad9-cdc2cc116780

Deployment details

Next steps

Go to resource group

Give feedback

Tell us about your experience with deployment

Cost Management

Get notified to stay within your budget and prevent unexpected charges on your bill. Set up cost alerts >

Microsoft Defender for Cloud

Secure your apps and infrastructure. Go to Microsoft Defender for Cloud >

Free Microsoft tutorials

Start learning today >

Work with an expert

Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support. Find an Azure expert >

On the **az104-08-vm1 Run Command Script** to create a drive Z: consisting of the two newly attached disks with the simple layout and fixed provisioning:

Home > az104-08-vm1 | Run command

Virtual machine

Search

Run Command uses the VM agent to let you run a script inside this virtual machine for maintenance. Select a command below to see details.

Name

RunPowerShellScript

DisableNLA

DisableWindowsUpdate

EnableAdminAccount

EnableEMS

EnableRemotePS

EnableWindowsUpdate

IPConfig

RDPSettings

ResetRDPcert

SetRDPport

Run Command Script

Script execution complete

6

7 New-Partition -DiskNumber 4 -UseMaximumSize -DriveLetter Z

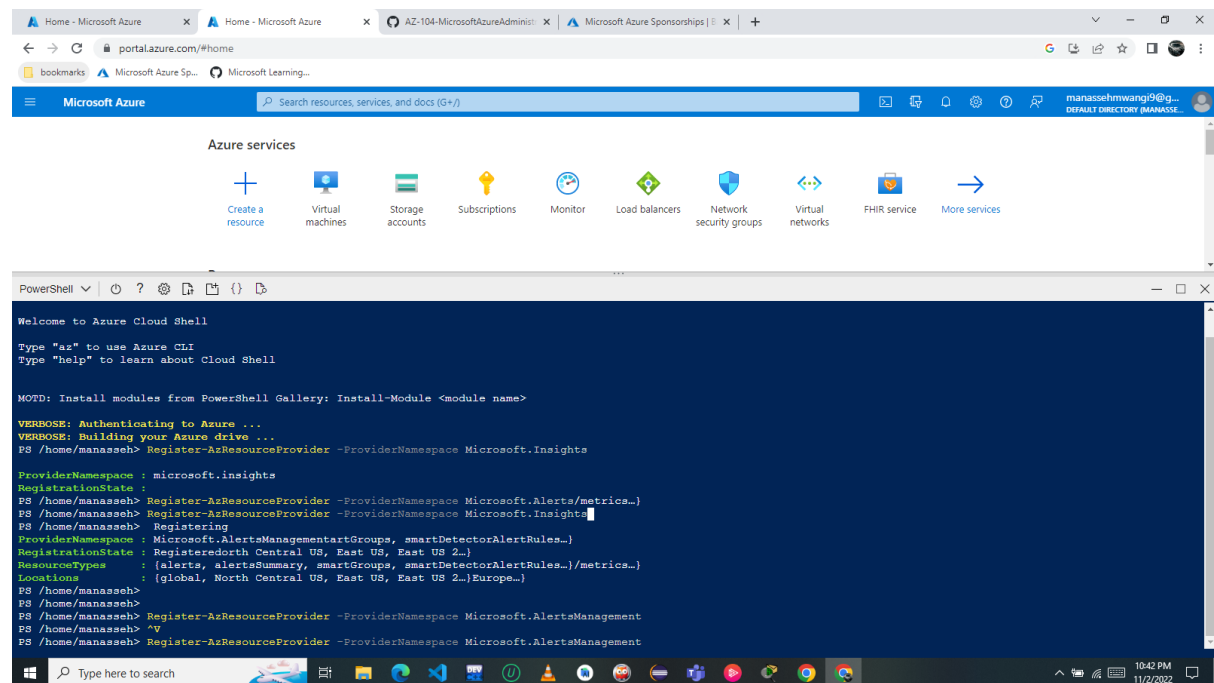
Run

Output

DiskNumber : 4
DriveLetter : Z
GptType : {ebd9ba2-b9e5-4433-87c0-68b6b72699c7}
Guid : {40f0d5c7-2b6c-4079-88dd-851292beee3f}
IsActive : False
IsBoot : False
IsDAX : False
IsHidden : False
IsOffline : False
IsReadOnly : False
IsShadowCopy : False
IsSystem : False
MbrType :
NoDefaultDriveLetter : False
Offset : 16777216
OperationalStatus : Online
PartitionNumber : 2
Size : 2196857946112
TransitionState : 1
PSComputerName :

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

From the Cloud Shell pane, run the following to register the Microsoft.Insights and Microsoft.AlertsManagement resource providers



```
PowerShell
Welcome to Azure Cloud Shell
Type "az" to use Azure CLI
Type "help" to learn about Cloud Shell

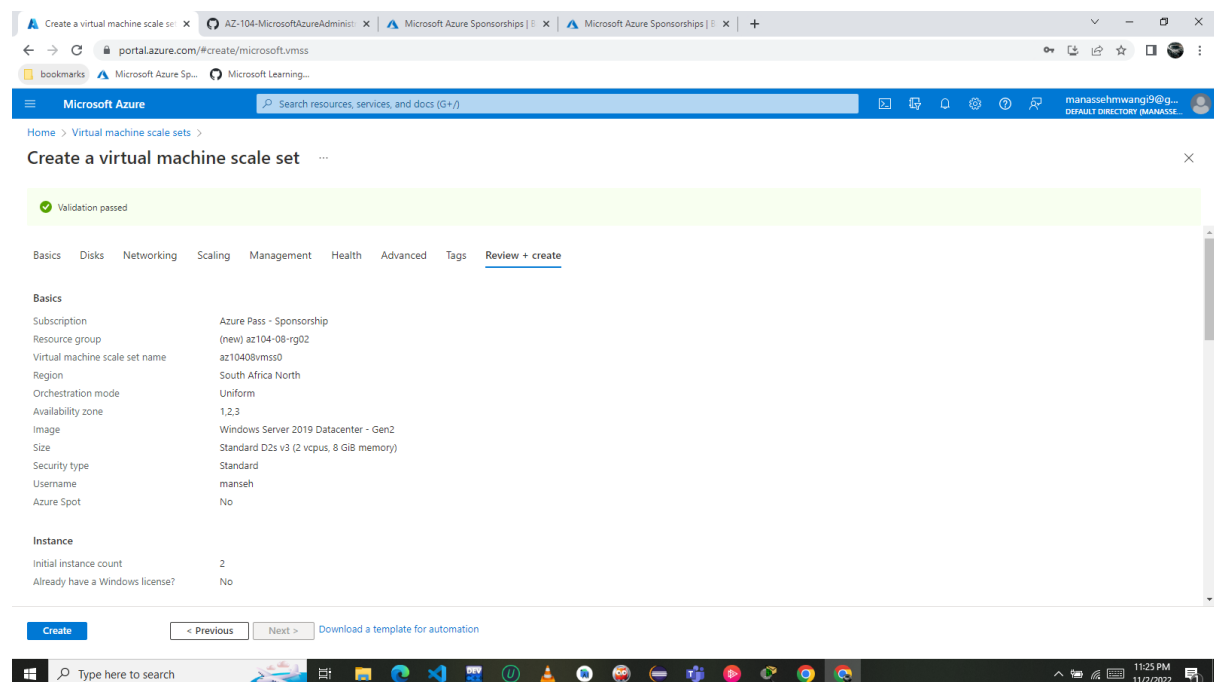
NOTD: Install modules from PowerShell Gallery: Install-Module <module name>

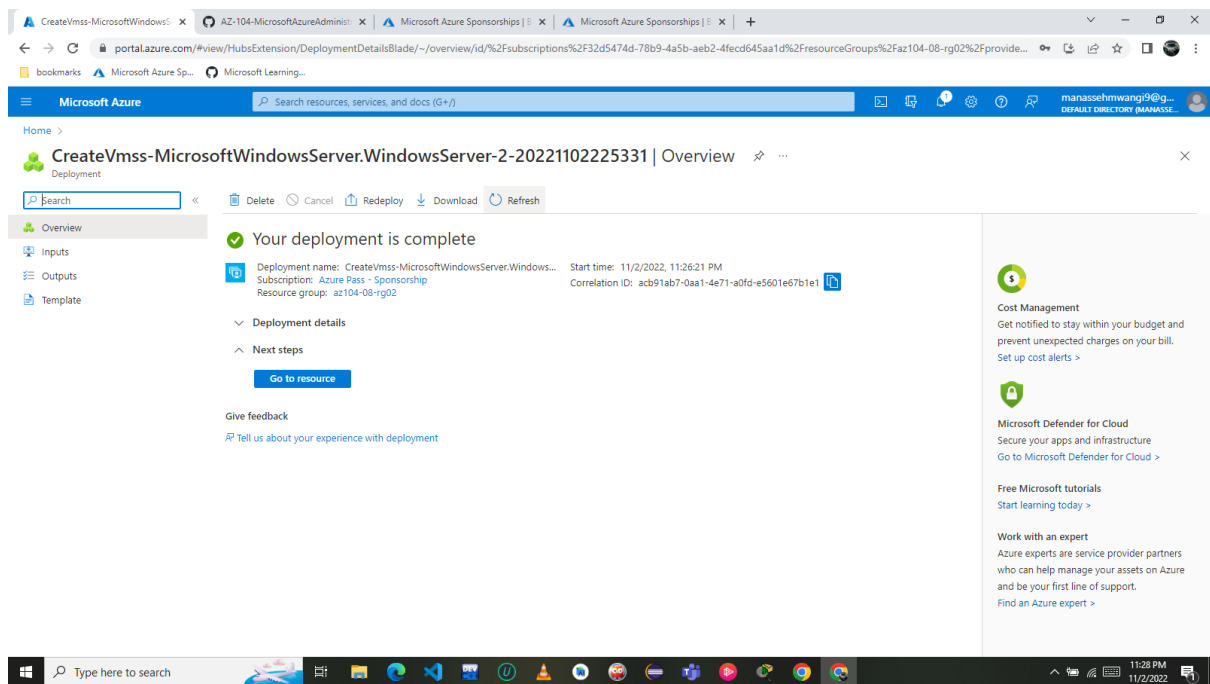
VERBOSE: Authenticating to Azure ...
VERBOSE: Building your Azure drive ...
PS /home/manasseh> Register-AzResourceProvider -ProviderNamespace Microsoft.Insights

ProviderNamespace : microsoft.insights
RegistrationState  :
PS /home/manasseh> Register-AzResourceProvider -ProviderNamespace Microsoft.Alerts/metrics...
PS /home/manasseh> Register-AzResourceProvider -ProviderNamespace Microsoft.Insights
ProviderNamespace : Microsoft.AlertsManagementAlertGroups, smartDetectorAlertRules...
RegistrationState  : Registered North Central US, East US, East US 2...
ResourceTypes     : (alerts, alertsSummary, smartGroups, smartDetectorAlertRules...)/metrics...
Locations         : (global, North Central US, East US, East US 2...Europe...)
PS /home/manasseh>
PS /home/manasseh> Register-AzResourceProvider -ProviderNamespace Microsoft.AlertsManagement
PS /home/manasseh> ^V
PS /home/manasseh> Register-AzResourceProvider -ProviderNamespace Microsoft.AlertsManagement
```

Task 5: Deploy zone-resilient Azure virtual machine scale sets

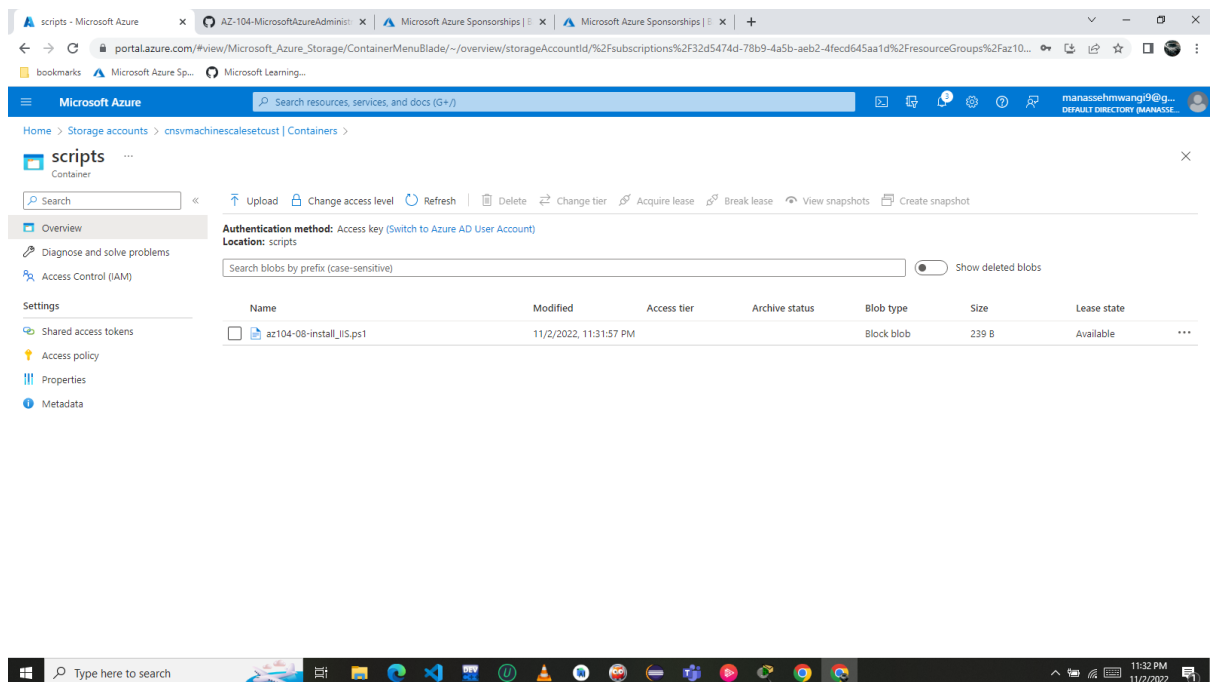
In this task, you will deploy Azure virtual machine scale set across availability zones by using the Azure portal.





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

In this task, you will install 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.



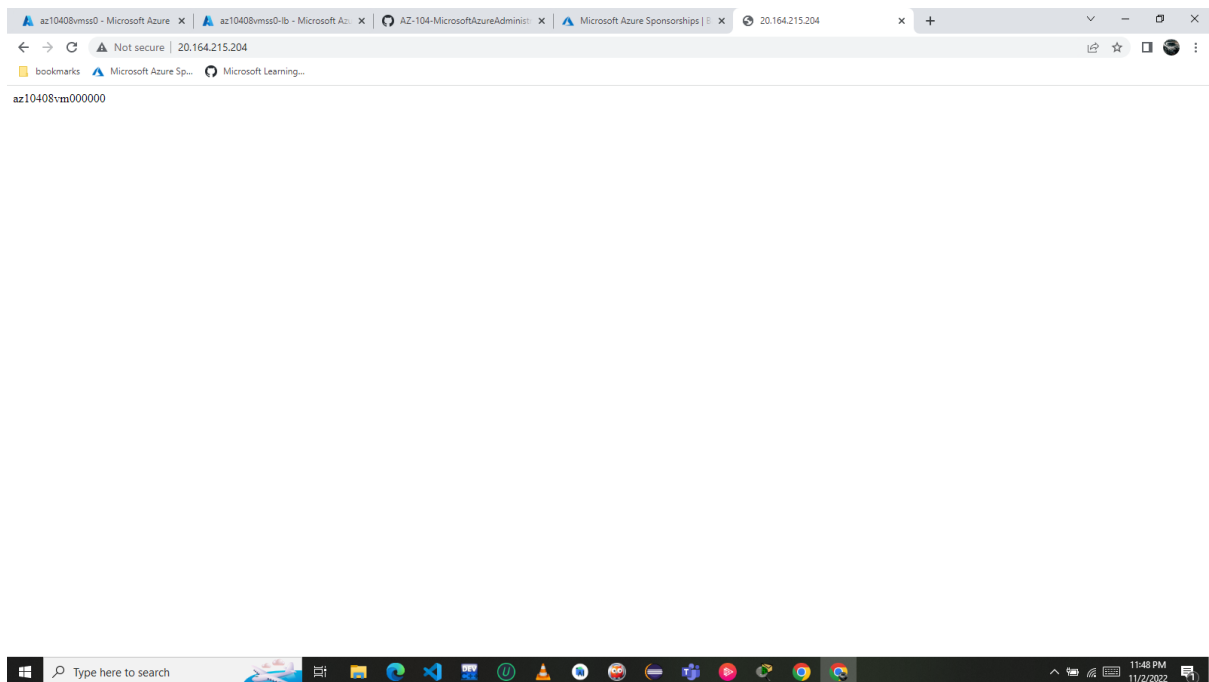
From the **Install extension** blade, **Browse** to and **Select** the **az104-08-install_IIS.ps1** script that was uploaded to the **scripts** container in the storage account earlier in this task, and then click **Create**.

The screenshot shows the Microsoft Azure portal interface. The main pane displays the 'Microsoft.CustomScriptExtension | Overview' blade. A green checkmark indicates 'Your deployment is complete'. Below this, deployment details are shown: 'Deployment name: Microsoft.CustomScriptExtension', 'Subscription: Azure Pass - Sponsorship', 'Resource group: az104-08-rg02', 'Start time: 11/2/2022, 11:35:14 PM', and 'Correlation ID: 36cf2a6f-ee8d-4315-b7bf-9b8fc8946aca'. A 'Go to resource' button is visible. The left sidebar shows navigation options like Overview, Inputs, Outputs, and Template. The right pane shows a 'Notifications' list with several events, including 'Deployment succeeded' and 'Upload Completed for az104-08-install_IIS.ps1'.

Click **Instances**, select the checkboxes next to the two instances of the virtual machine scale set, click **Upgrade**, and then, when prompted for confirmation, click **Yes**.

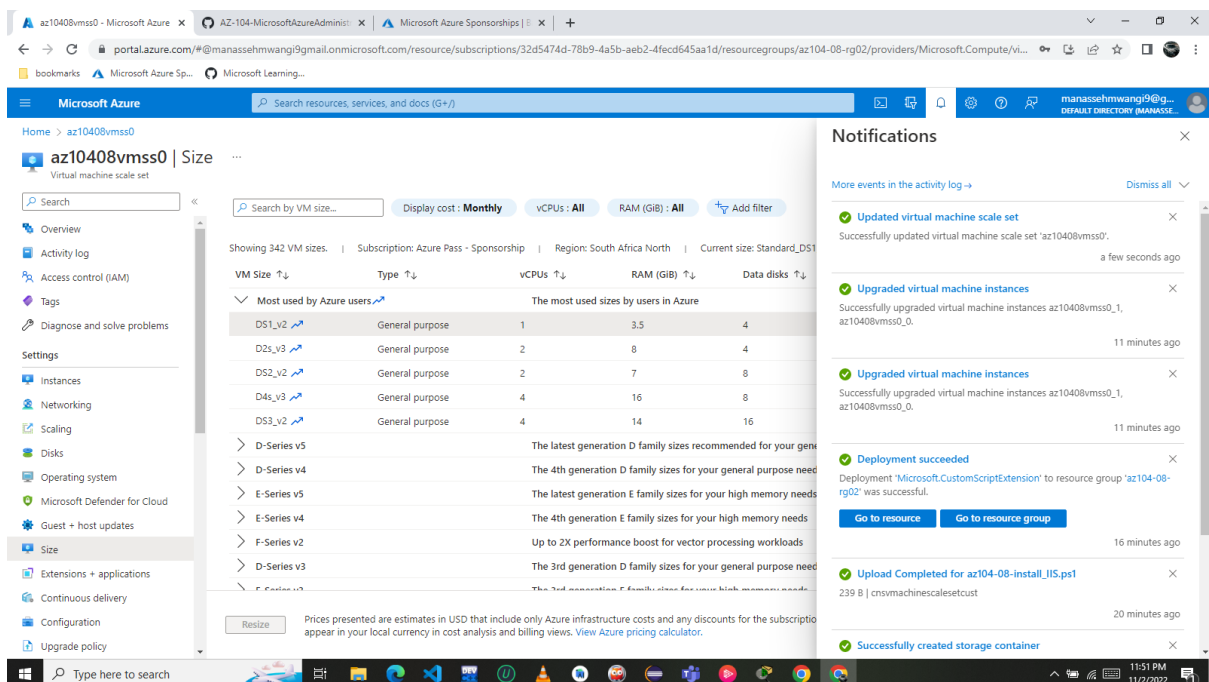
The screenshot shows the Microsoft Azure portal interface. The main pane displays the 'az10408vmss0 | Instances' blade. A table lists two instances: 'az10408vmss0_0' and 'az10408vmss0_1', both with a status of 'Running'. The left sidebar shows navigation options like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Settings, and Instances. The right pane shows a 'Notifications' list with several events, including 'Upgraded virtual machine instances', 'Deployment succeeded', 'Upload Completed for az104-08-install_IIS.ps1', and 'Successfully created storage container'.

On the **az10408vmss0-lb Load balancer** , note the value of the **Public IP address** assigned to the frontend of the load balancer, open a new browser tab, and navigate to that IP address.



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

Search for and select **Virtual machine scale sets** and select the **az10408vmss0** scale set. In the list of available sizes, select **Standard DS1_v2** and click **Resize**



On the **az10408vmss0 - Scaling** blade, select the **Custom autoscale** option and configure autoscale with the following settings (leave others with their default value)

The screenshot shows the Azure portal interface for the 'az10408vmss0' virtual machine scale set. The 'Scaling' blade is selected in the left-hand navigation pane. The main content area displays the 'Predictive autoscale' configuration. The 'Mode' is set to 'Disabled'. The 'Scale mode' is set to 'Scale based on a metric'. A single rule is configured with the condition '(Average) Network in Total > 10' and the action 'Increase count by 1'. The 'Instance limits' are set to 'Minimum: 1', 'Maximum: 3', and 'Default: 1'. The 'Schedule' section indicates that the scale condition is executed when none of the other scale condition(s) match.

Open the **Azure Cloud Shell** by clicking on the icon in the top right of the Azure Portal. Run the following to identify the public IP address of the load balancer in front of the Azure virtual machine scale set **az10408vmss0**

Run the following to start an infinite loop that sends the HTTP requests to the web sites hosted on the instances of Azure virtual machine scale set **az10408vmss0**.

The screenshot shows the Azure Cloud Shell terminal window. The terminal displays the output of a curl command, showing the HTTP status code 200 OK and the content type text/html. The output also includes the date and time of the request, indicating that the web site is accessible.

The third instance is provisioned

Home > az10408vmss0 | Instances

Virtual machine scale set

Search virtual machine instances

Instance	Computer name	Status	Protection policy	Provisioning state	Health state	Latest model
az10408vmss0_0	az10408vm000000	Running		Succeeded		Yes
az10408vmss0_1	az10408vm000001	Running		Succeeded		Yes
az10408vmss0_2	az10408vm000002	Creating (Running)		Creating		Yes

Its **Location** (it should be different than the first two zones you identified earlier in this task.

SouthAfrica North zone3

Home > az10408vmss0 | Instances > az10408vmss0_2

Scale set instance

Overview

Essentials

Instance ID	: 2	Public IP address	: 102.37.155.24
Status	: Running 1 more	Private IP address	: 10.82.0.6
Location	: South Africa North (Zone 3)	Public IP address (IPv6)	: -
Provisioning state	: Succeeded	Private IP address (IPv6)	: -
Latest model applied	: Yes	Virtual network/subnet	: az104-08-rg02-vnet/subnet0
Computer name	: az10408vm000002	Disk	: az10408vmss0_az10408vmss0_2_OsDisk_1_cd9528b5365149f98a912217...
Fault domains	: 5	Protection Policy	: -
SKU	: Standard_DS1_v2	Health state	: -
Tags	: project : cns		

Show data for last: 1 hour 6 hours 12 hours 1 day 7 days 30 days

CPU (average)

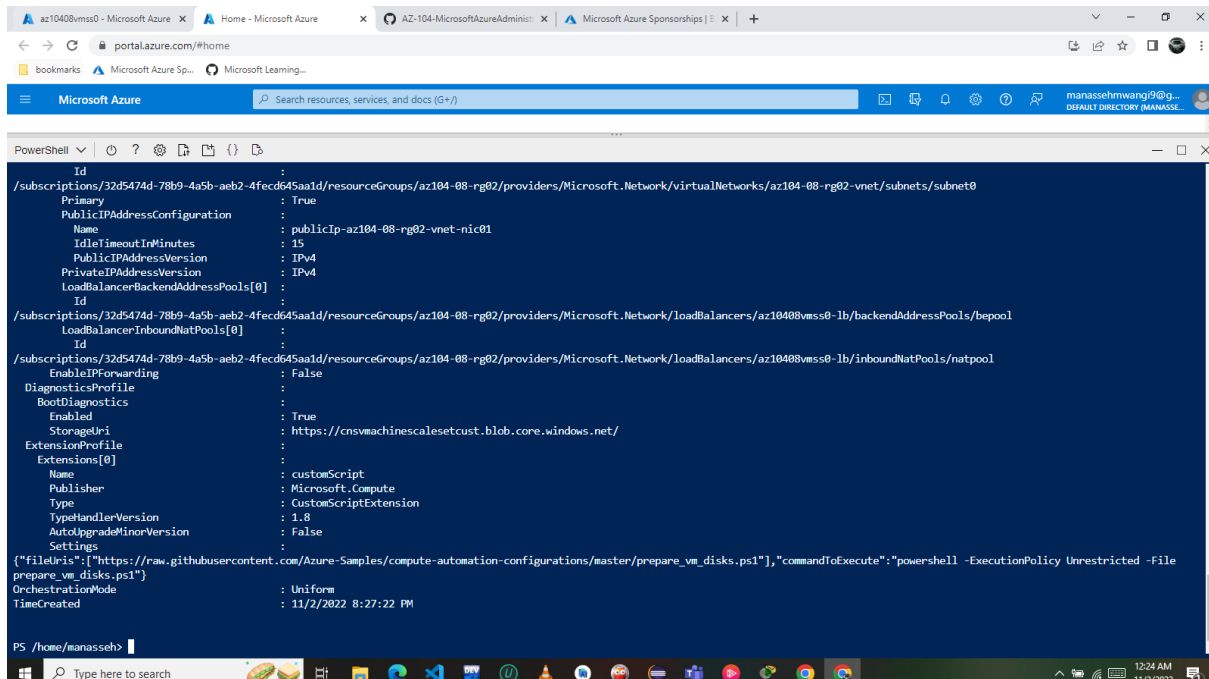
100%
80%

On the **az10408vmss0** blade, in the **Settings** section, click **Disks**, click + **Create and attach a new disk**, and attach a new managed disk

The disk attached in the previous step is a raw disk. Before it can be used, it is necessary to create a partition, create a filesystem, and mount it.

Upload the file `\Allfiles\Labs\08\az104-08-configure_VMSS_disks.ps1` into the Cloud Shell home directory run the script

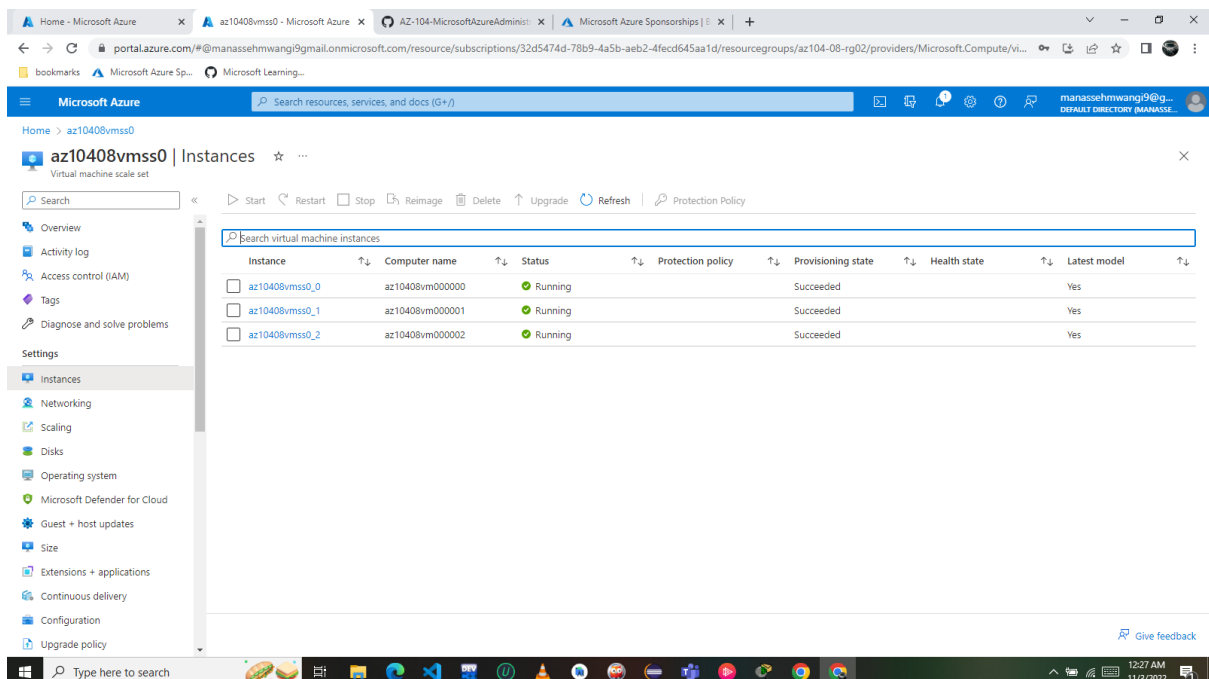
The script installs a custom script extension that configures the attached disk.



```
Id
:
/subscriptions/32d5474d-78b9-4a5b-aeb2-4fec645aa1d/resourceGroups/az104-08-rg02/providers/Microsoft.Network/virtualNetworks/az104-08-rg02-vnet/subnets/subnet0
Primary
: True
PublicIpAddressConfiguration
: publicIp-az104-08-rg02-vnet-nic01
IdleTimeoutMinutes
: 15
PublicIpAddressVersion
: IPv4
PrivateIpAddressVersion
: IPv4
LoadBalancerBackendAddressPools[0]
:
Id
:
/subscriptions/32d5474d-78b9-4a5b-aeb2-4fec645aa1d/resourceGroups/az104-08-rg02/providers/Microsoft.Network/loadBalancers/az10408vmss0-lb/backendAddressPools/bepool
LoadBalancerInboundNatPools[0]
:
Id
:
/subscriptions/32d5474d-78b9-4a5b-aeb2-4fec645aa1d/resourceGroups/az104-08-rg02/providers/Microsoft.Network/loadBalancers/az10408vmss0-lb/inboundNatPools/natpool
EnableIPForwarding
: False
DiagnosticsProfile
:
BootDiagnostics
:
Enabled
: True
StorageUri
: https://cnsvmachinescalesetcust.blob.core.windows.net/
ExtensionProfile
:
Extensions[0]
:
Name
: customScript
Publisher
: Microsoft.Compute
Type
: CustomScriptExtension
TypeHandlerVersion
: 1.8
AutoUpgradeMinorVersion
: False
Settings
:
{"fileUri": ["https://raw.githubusercontent.com/Azure-Samples/compute-automation-configurations/master/prepare_vm_disks.ps1"], "commandToExecute": "powershell -ExecutionPolicy Unrestricted -file prepare_vm_disks.ps1"}
OrchestrationMode
: Uniform
TimeCreated
: 11/2/2022 8:27:22 PM

PS /home/manasseh>
```

click **Upgrade**, and then, when prompted for confirmation, click **Yes**.



Home > az10408vmss0

az10408vmss0 | Instances

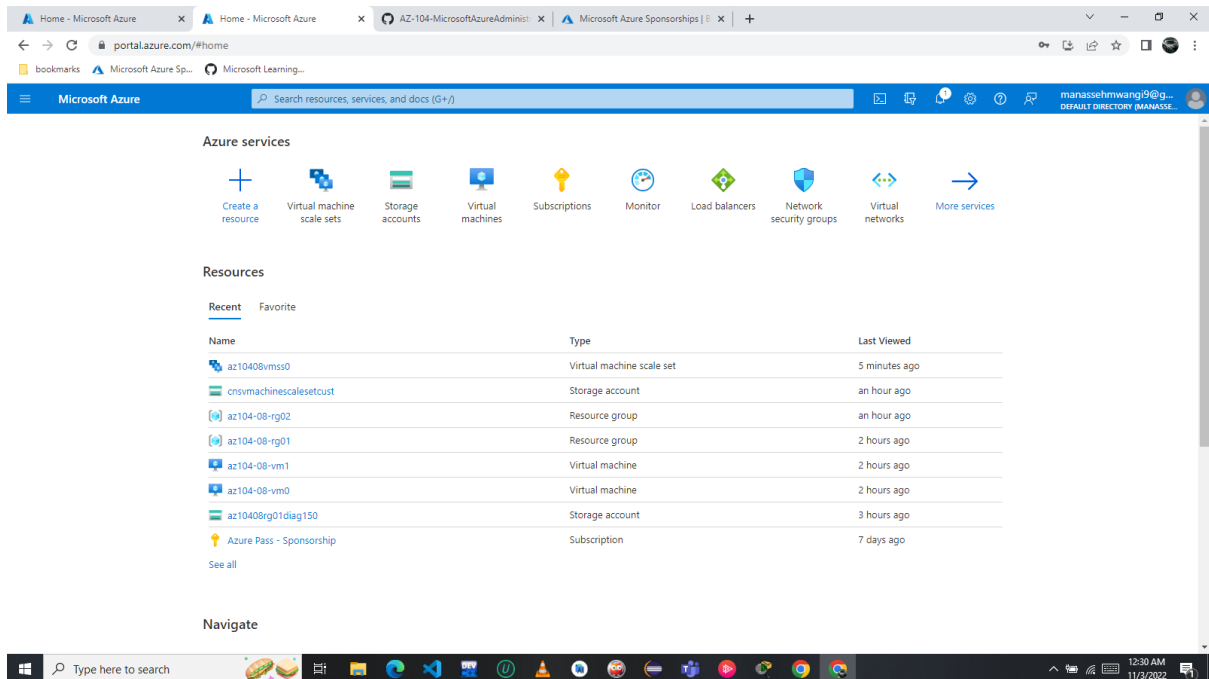
Virtual machine scale set

Search virtual machine instances

Instance	Computer name	Status	Protection policy	Provisioning state	Health state	Latest model
<input type="checkbox"/> az10408vmss0_0	az10408vm000000	Running		Succeeded		Yes
<input type="checkbox"/> az10408vmss0_1	az10408vm000001	Running		Succeeded		Yes
<input type="checkbox"/> az10408vmss0_2	az10408vm000002	Running		Succeeded		Yes

Upgrade policy

Homepage showing all the resource group, virtual machine scale set, virtual machines and storage accounts.



Open the Azure Cloud Shell

Remove any newly created Azure resources that you no longer use. Removing unused resources ensures you will not see unexpected charges

