

Week7: Assignment 1:- Manage Virtual Machines

Report by: **Aisha Khalifan, cs-cns04-23014**

Introduction

This report is your guide to the exciting world of Azure virtual machines (VMs) – how to set them up and make them work seamlessly. We are going to focus on making sure they're super reliable, scalable, and check out cool things like Azure virtual machine scale sets. Plus, we will see how to make things even easier with the nifty Azure Virtual Machine Custom Script extension. We will be doing fun stuff like setting up zone-resilient Azure VMs, tweaking VMs with cool extensions, and making sure we scale up our compute and storage game for both VMs and scale sets.

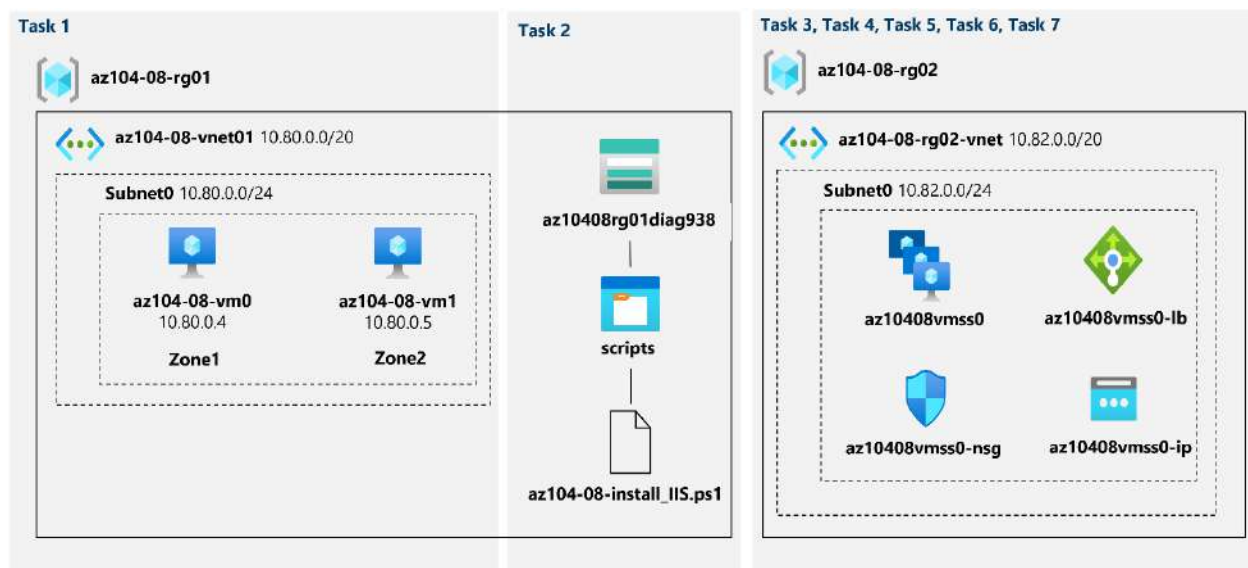
Lab Tasks

Objectives

In this lab, you will:

- ❖ Task 1: Deploy zone-resilient Azure virtual machines by using the Azure portal and an Azure Resource Manager template
- ❖ Task 2: Configure Azure virtual machines by using virtual machine extensions
- ❖ Task 3: Scale compute and storage for Azure virtual machines
- ❖ Task 4: Register the Microsoft.Insights and Microsoft.AlertsManagement resource providers
- ❖ Task 5: Deploy zone-resilient Azure virtual machine scale sets by using the Azure portal
- ❖ Task 6: Configure Azure virtual machine scale sets by using virtual machine extensions
- ❖ Task 7: Scale compute and storage for Azure virtual machine scale sets (optional)

Architecture Diagram

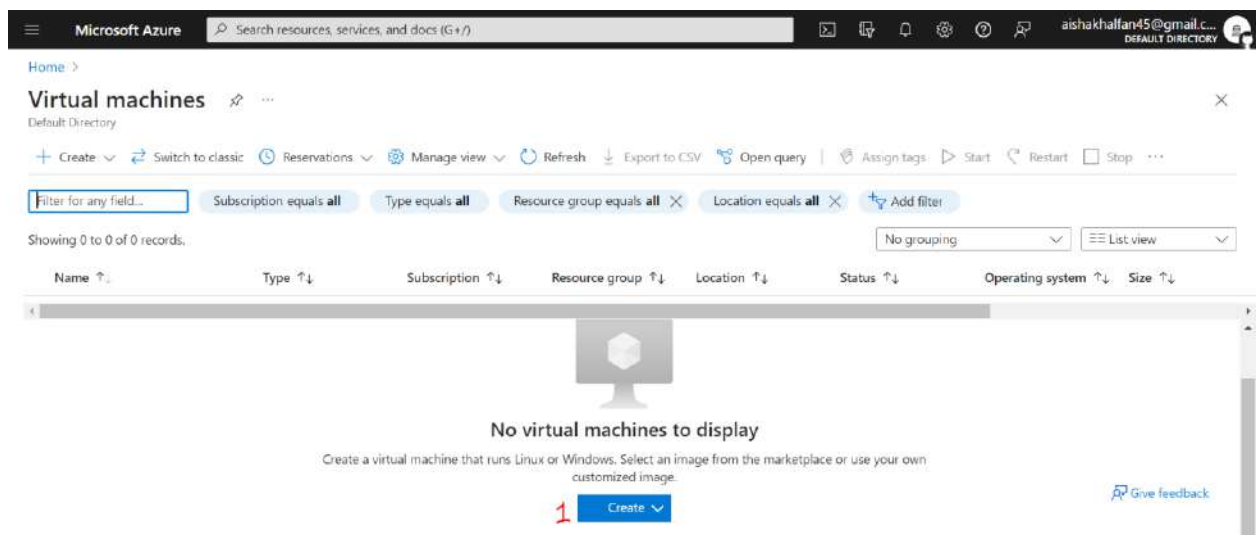


Exercise 1

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

In this task, you will deploy Azure virtual machines into different availability zones by using the Azure portal and an Azure Resource Manager template.

1. Sign in to the [Azure portal](#).
2. In the Azure portal, search for and select **Virtual machines** and, on the **Virtual machines** blade, click **+ Create**, click **+ Azure virtual machine**.



3. On the **Basics** tab of the **Create a virtual machine** blade, specify the following settings (leave others with their default values):

Setting	Value
Subscription	the name of the Azure subscription you will be using in this lab
Resource group	the name of a new resource group az104-08-rg01
Virtual machine name	az104-08-vm0
Region	select one of the regions that support availability zones and where you can provision Azure virtual machines
Availability options	Availability zone
Availability zone	Zone 1
Image	Windows Server 2019 Datacenter - Gen1/Gen2
Azure Spot instance	No

Setting	Value
Size	Standard D2s v3
Username	Student
Password	Provide a secure password
Public inbound ports	None
Would you like to use an existing Windows Server license?	Unchecked

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

Home > Virtual machines >

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 * ⓘ Azure for Students

Resource group * ⓘ (New) az104-08-rg01
[Create new](#)

Instance details

Virtual machine name * ⓘ az104-08-vm0

Region * ⓘ (US) East US

Availability options ⓘ Availability zone

Availability zone * ⓘ Zones 1

[Review + create](#) [< Previous](#) [Next : Disks >](#) [Give feedback](#)

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Home > Virtual machines >

Create a virtual machine

You can now select multiple zones. Selecting multiple zones will create one VM per zone. [Learn more](#)

Security type ⓘ Trusted launch virtual machines
[Configure security features](#)

Image * ⓘ Windows Server 2019 Datacenter - x64 Gen2
[See all images](#) | [Configure VM generation](#)

VM architecture ⓘ
☐ Arm64
☒ x64
 Arm64 is not supported with the selected image.

Run with Azure Spot discount ⓘ ☐

Size * ⓘ Standard_DS1_v2 - 1 vcpu, 3.5 GiB memory (\$91.98/month)

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- Click **Next: Disks >** and, on the **Disks** tab of the **Create a virtual machine** blade, specify the following settings (leave others with their default values):

Setting	Value
OS disk type	Premium SSD
Enable Ultra Disk compatibility	Unchecked

- Click **Next: Networking >** and, on the **Networking** tab of the **Create a virtual machine** blade, click **Create new** below the **Virtual network** textbox.

- On the **Create virtual network** blade, specify the following settings (leave others with their default values):

Setting	Value
Name	az104-08-vnet01
Address range	10.80.0.0/20
Subnet name	subnet0
Subnet range	10.80.0.0/24

Create virtual network

Name * az104-08-vnet01

Address space

The virtual network's address space, specified as one or more address prefixes in CIDR notation (e.g. 192.168.1.0/24).

Address range *	Addresses	Overlap
<input type="checkbox"/> 10.0.0.0/16	10.0.0.0 - 10.0.255.255 (65536 addresses)	None
<input checked="" type="checkbox"/> 10.80.0.0/20	10.80.0.0 - 10.80.15.255 (4096 addresses)	None
<input type="checkbox"/> (0 Addresses)	(0 Addresses)	None

Subnets

The subnet's address range in CIDR notation. It must be contained by the address space of the virtual network.

Subnet name	Address range	Addresses
<input type="checkbox"/> default	10.0.0.0/24	10.0.0.0 - 10.0.0.255 (256 addresses)
<input checked="" type="checkbox"/> subnet0	10.80.0.0/24	10.80.0.0 - 10.80.0.255 (256 addresses)

Review + create < Previous Next : Manage OK Discard

7. Click **OK** and, back on the **Networking** tab of the **Create a virtual machine** blade, specify the following settings (leave others with their default values):

Setting	Value
Subnet	subnet0
Public IP	default
NIC network security group	basic
Public inbound Ports	None
Accelerated networking	Off
Place this virtual machine behind an existing load balancing solution?	Unchecked

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Home > Virtual machines >

Create a virtual machine

Virtual network * [Create new](#)

Subnet * [Create new](#)

Public IP [Create new](#)

NIC network security group ☐ None ☒ Basic ☐ Advanced

Public inbound ports * ☒ None ☐ Allow selected ports

Select inbound ports

[Review + create](#) [< Previous](#) [Next: Management >](#) [Give feedback](#)

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Home > Virtual machines >

Create a virtual machine

Delete public IP and NIC when VM is deleted ☐

Enable accelerated networking ☐

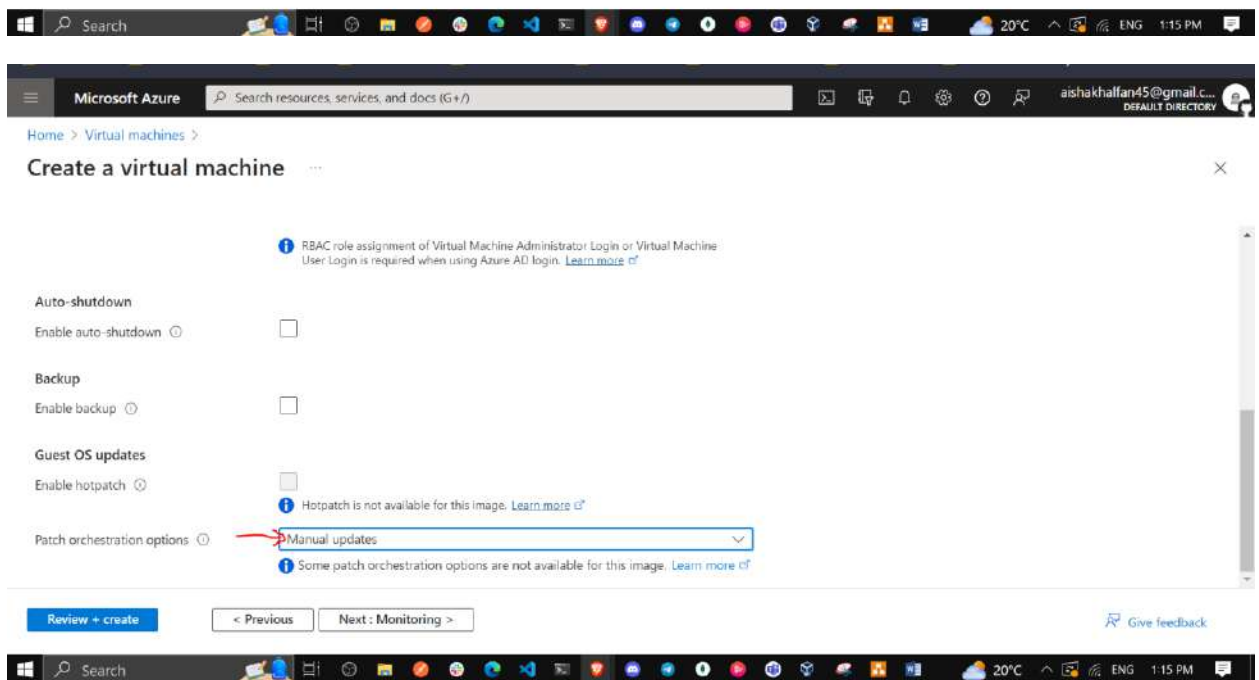
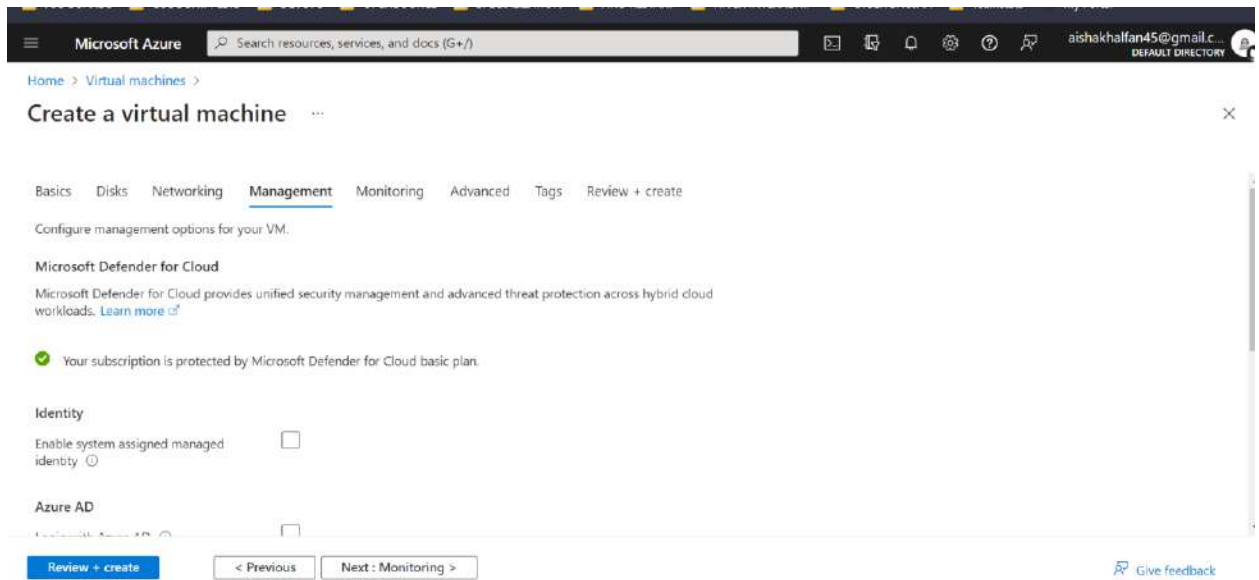
Load balancing
You can place this virtual machine in the backend pool of an existing Azure load balancing solution. [Learn more](#)

Load balancing options ☒ None ☐ Azure load balancer Supports all TCP/UDP network traffic, port-forwarding, and outbound flows. ☐ Application gateway Web traffic load balancer for HTTP/HTTPS with URL-based routing, SSL termination, session persistence, and web application firewall.

[Review + create](#) [< Previous](#) [Next: Management >](#) [Give feedback](#)

8. Click **Next: Management >** and, on the **Management** tab of the **Create a virtual machine** blade, specify the following settings (leave others with their default values):

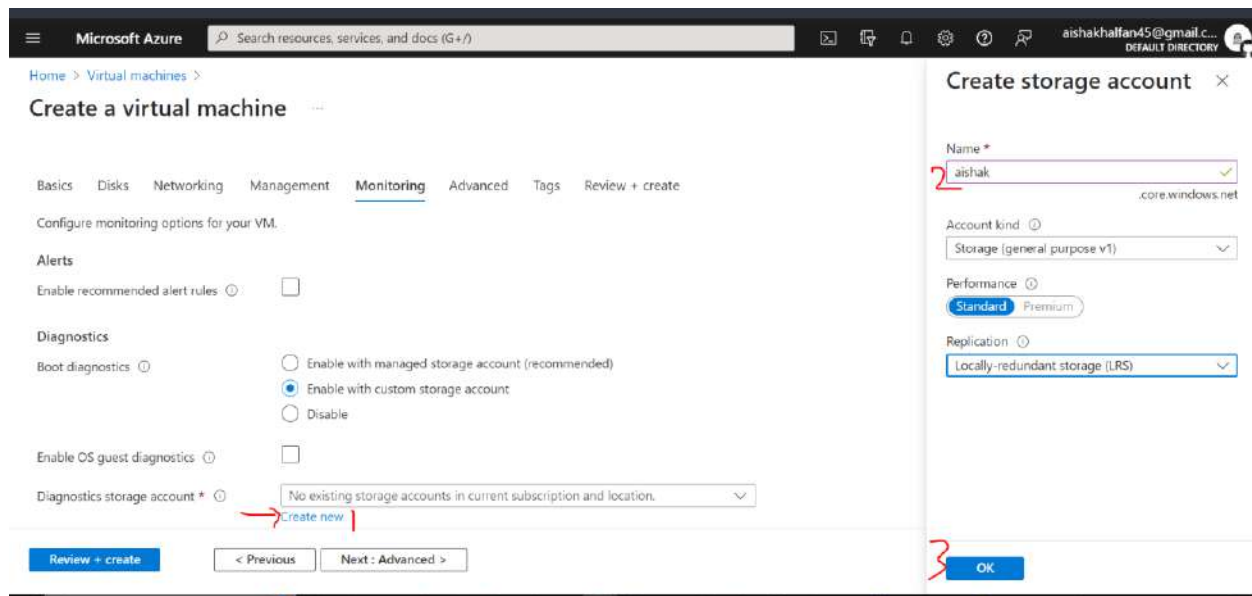
Setting	Value
Patch orchestration options	Manual updates



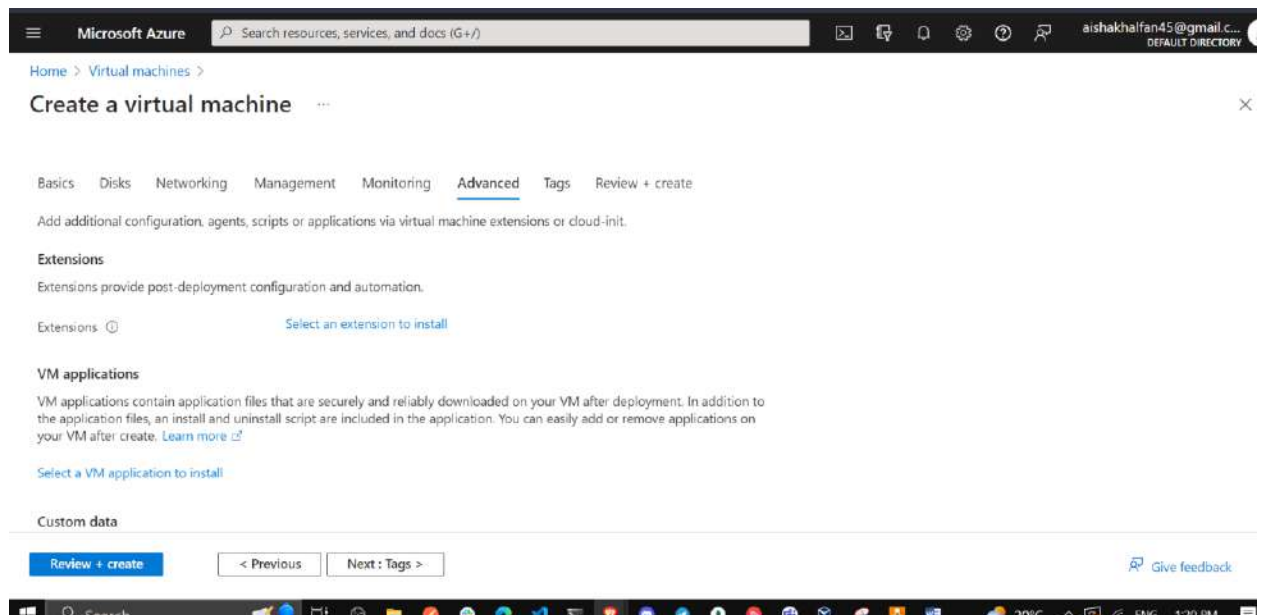
9. Click **Next: Monitoring >** and, on the **Monitoring** tab of the **Create a virtual machine** blade, specify the following settings (leave others with their default values):

Setting	Value
Boot diagnostics	Enable with custom storage account
Diagnostics storage account	accept the default value

Note: If necessary, select an existing storage account in the dropdown list or create a new storage account. Record the name of the storage account. You will use it in the next task.



- Click **Next: Advanced >**, on the **Advanced** tab of the **Create a virtual machine** blade, review the available settings without modifying any of them, and click **Review + Create**.



- On the **Review + Create** blade, click **Create**.

The image shows two screenshots of the Microsoft Azure portal. The top screenshot is the 'Create a virtual machine' wizard, and the bottom screenshot is the deployment blade for the created VM.

Top Screenshot: Create a virtual machine

Navigation: Home > Virtual machines > Create a virtual machine

Status: Validation passed

Tabs: Basics | Disks | Networking | Management | Monitoring | Advanced | Tags | **Review + create**

Price: 1 X Standard DS1 v2 by Microsoft. Subscription credits apply. **0.1260 USD/hr**. Pricing for other VM sizes.

Buttons: Create, < Previous, Next >, Download a template for automation, Give feedback

Bottom Screenshot: CreateVm-MicrosoftWindowsServer.WindowsServer-201-20231115125813 | Overview

Deployment details:

- Deployment name: CreateVm-MicrosoftWindowsServer.Win...
- Subscription: Azure for Students
- Resource group: az104-08-rg01
- Start time: 11/15/2023, 1:23:22 PM
- Correlation ID: aef9ee29-9d53-4f85-8357

Deployment details table:

Resource	Type	Status	Operation details
No results.			

Buttons: Delete, Cancel, Redeploy, Download, Refresh

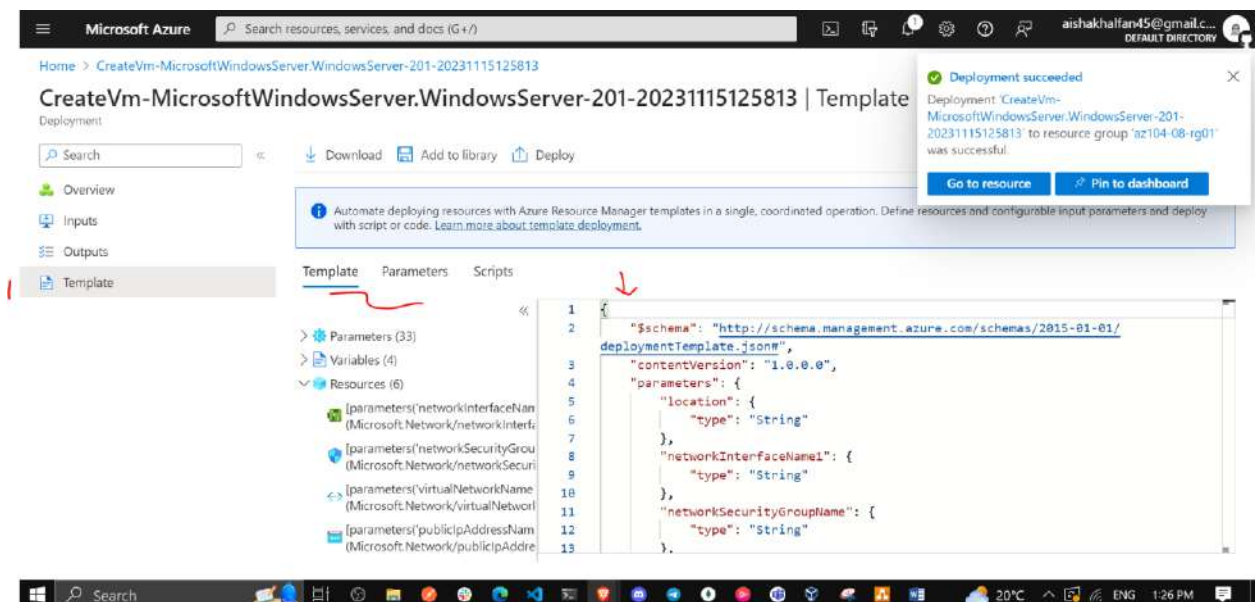
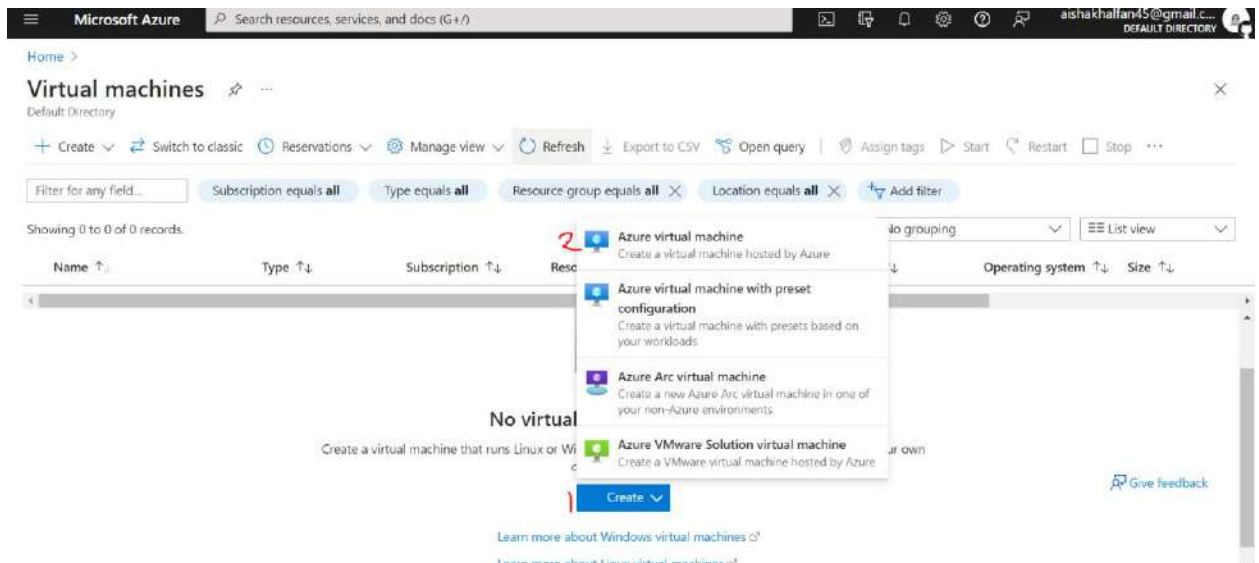
Give feedback: Tell us about your experience with deployment

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

Free Microsoft tutorials: Start learning today >

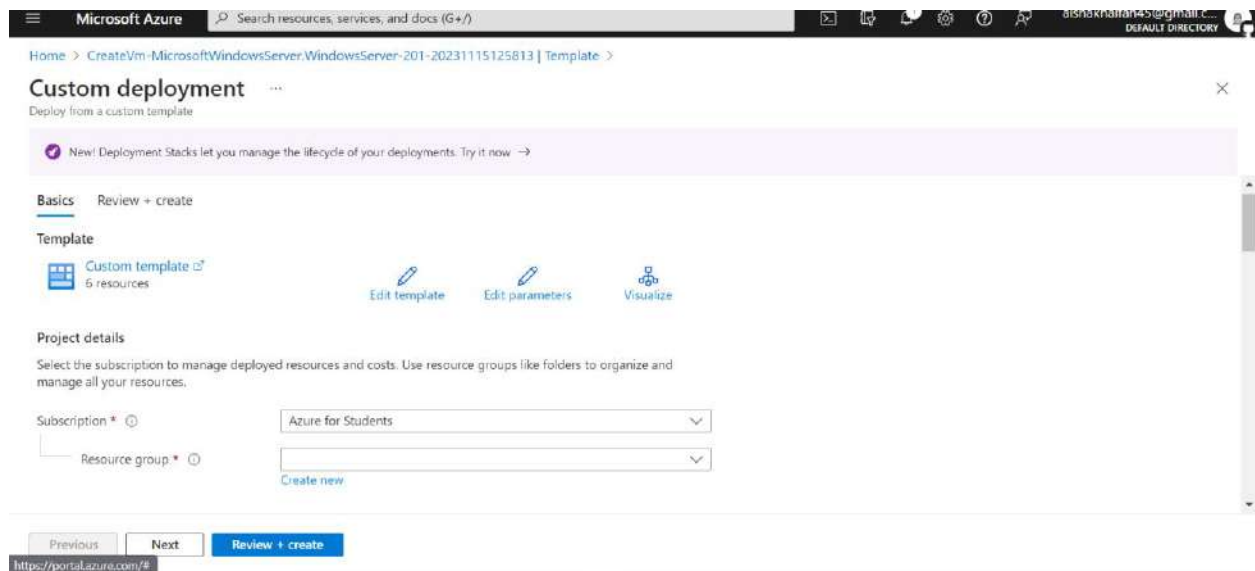
Work with an expert: Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support. Find an Azure expert >

12. On the deployment blade, click **Template**.



13. Review the template representing the deployment in progress and click **Deploy**.

Note: You will use this option to deploy the second virtual machine with matching configuration except for the availability zone.



14. On the **Custom deployment** blade, specify the following settings (leave others with their default values):

Setting	Value
Resource Group	az104-08-rg01
Network Interface Name	az104-08-vm1-nic1
Public IP Address Name	az104-08-vm1-ip
Virtual Machine Name, Virtual Machine Name1, Virtual Machine Computer Name	az104-08-vm1
Virtual Machine RG	az104-08-rg01
Admin Username	Student
Admin Password	Provide a secure password
Enable Hotpatching	false
Zone	2

Note: You need to modify parameters corresponding to the properties of the distinct resources you are deploying by using the template, including the virtual machine and its network interface.

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👤 aishakhalfan45@gmail.c...
DEFAULT DIRECTORY

Home > CreateVm-MicrosoftWindowsServer.WindowsServer-201-20231115125813 | Template >

Custom deployment

Deploy from a custom template

✔️ New! Deployment Stacks let you manage the lifecycle of your deployments. Try it now →
manage all your resources.

Subscription *

Azure for Students

Resource group *

az104-08-rg01

Create new

Instance details

Region *

(US) East US

Location *

eastus

Network Interface Name1 *

az104-08-vm1-nic1

Network Security Group Name *

az104-08-vm0-nsg

Network Security Group Rules *

[]

Previous

Next

Review + create

https://portal.azure.com/#

Microsoft Azure

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👤 aishakhalfan45@gmail.c...
DEFAULT DIRECTORY

Home > CreateVm-MicrosoftWindowsServer.WindowsServer-201-20231115125813 | Template >

Custom deployment

Deploy from a custom template

✔️ New! Deployment Stacks let you manage the lifecycle of your deployments. Try it now →

Network Security Group Name *

az104-08-vm0-nsg

Network Security Group Rules *

[]

Subnet Name *

subnet0

Virtual Network Name *

az104-08-vnet01

Address Prefixes *

["10.0.0.0/16", "10.80.0.0/20"]

Subnets *

[{"name":"default","properties":{"addressPrefix":"10.0.0.0/24"}}, {"name":"s...

Public Ip Address Name1 *

az104-08-vm1-ip

Public Ip Address Type *

Static

Public Ip Address Sku *

Standard

Previous

Next

Review + create

https://portal.azure.com/#

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Home > CreateVm-MicrosoftWindowsServer.WindowsServer-201-20231115125813 | Template >

Custom deployment

Deploy from a custom template

New! Deployment Stacks let you manage the lifecycle of your deployments. Try it now →

Pip Delete Option *	Detach ✓
Virtual Machine Name *	az104-08-vm1 ✓
Virtual Machine Name1 *	az104-08-vm1 ✓
Virtual Machine Computer Name1 *	az104-08-vm1 ✓
Virtual Machine RG *	az104-08-rg01 ✓
Os Disk Type *	Premium_LRS ✓
Os Disk Delete Option *	Delete ✓
Virtual Machine Size *	1x Standard D51 v2 1 vcpu, 3.5 GB memory Choose size

Previous Next **Review + create**

15. Click **Review + Create**, on the **Review + Create** blade, click **Create**.

Note: Wait for both deployments to complete before you proceed to the next task. This might take about 5 minutes.

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

Home > CreateVm-MicrosoftWindowsServer.WindowsServer-201-20231115125813 | Template >

Custom deployment

Deploy from a custom template

Basics **Review + create**

Summary

Custom template
6 resources

Terms

[Azure Marketplace Terms](#) | [Azure Marketplace](#)

By clicking "Create," I (a) agree to the applicable legal terms associated with the offering; (b) authorize Microsoft to charge or bill my current payment method for the fees associated with the offering(s), including applicable taxes, with the same billing frequency as my Azure subscription, until I discontinue use of the offering(s); and (c) agree that, if the deployment involves 3rd party offerings, Microsoft may share my contact information and other details of such deployment with the publisher of that offering.

Microsoft assumes no responsibility for any actions performed by third-party templates and does not provide rights for third-party products or services. See the [Azure Marketplace Terms](#) for additional terms.

Previous Next **Create**

Microsoft Azure | Search resources, services, and docs (G+)

Home > Microsoft.Template-20231115134759 | Overview

Deployment

Deployment is in progress

Deployment name: Microsoft.Template-20231115134759, Start time: 11/15/2023, 1:48:09 PM, Subscription: Azure for Students, Correlation ID: eeead769-08a1-499f-a36e-25...

Resource group: az104-08-rg01

Resource	Type	Status	Operat
az104-08-vm1	Virtual machine	Created	Operat
az104-08-vm1-nic	Network interface	Created	Operat
az104-08-vm1-ip	Public IP address	OK	Operat
aishak	Storage account	OK	Operat
az104-08-vnet01	Virtual network	OK	Operat

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

In this task, you will install 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.

1. In the Azure portal, search for and select **Storage accounts** and, on the **Storage accounts** blade, click the entry representing the diagnostics storage account you created in the previous task.

Microsoft Azure | Search resources, services, and docs (G+)

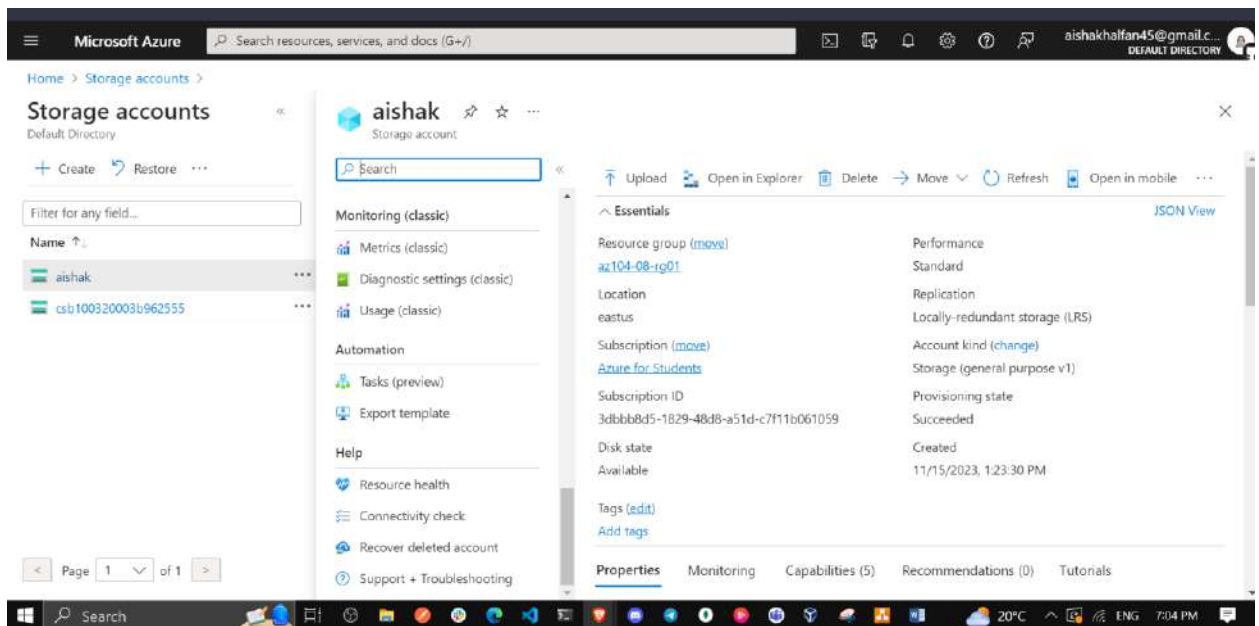
Home > Storage accounts

Storage accounts

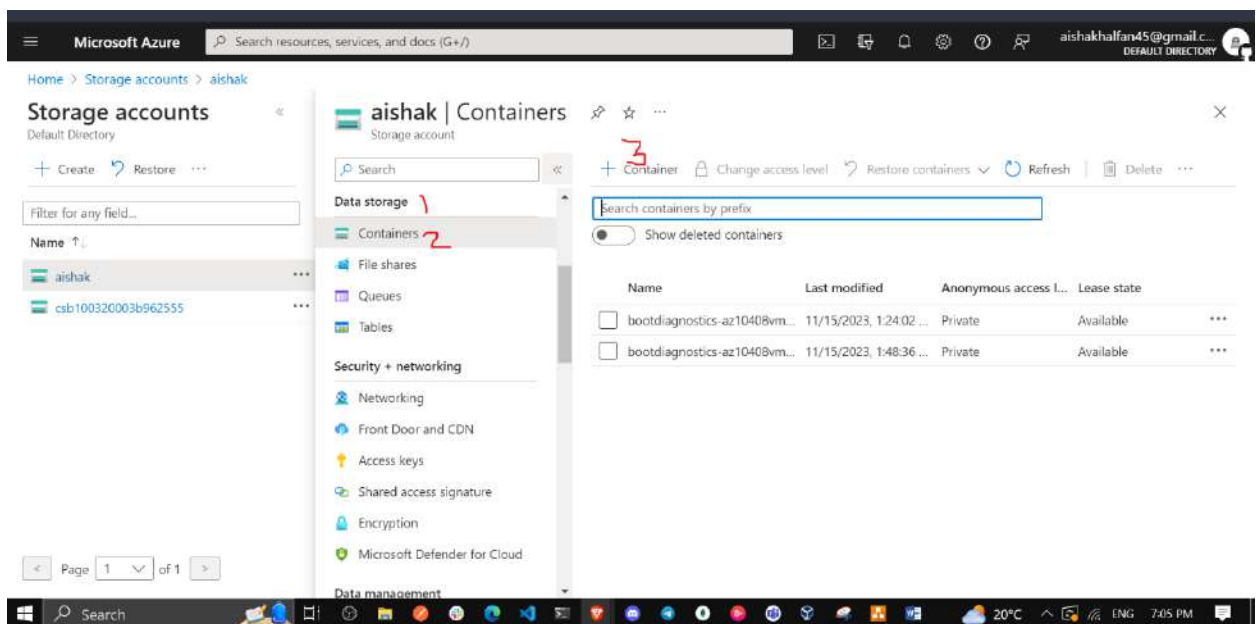
Filter for any field... Subscription equals all Resource group equals all Location equals all Add filter

Showing 1 to 2 of 2 records.

Name	Type	Kind	Resource group	Location	Subscription
aishak	Storage account	Storage	az104-08-rg01	East US	Azure for Students
csb100320003b962555	Storage account	StorageV2	cloud-shell-storage-west-...	West Europe	Azure for Students

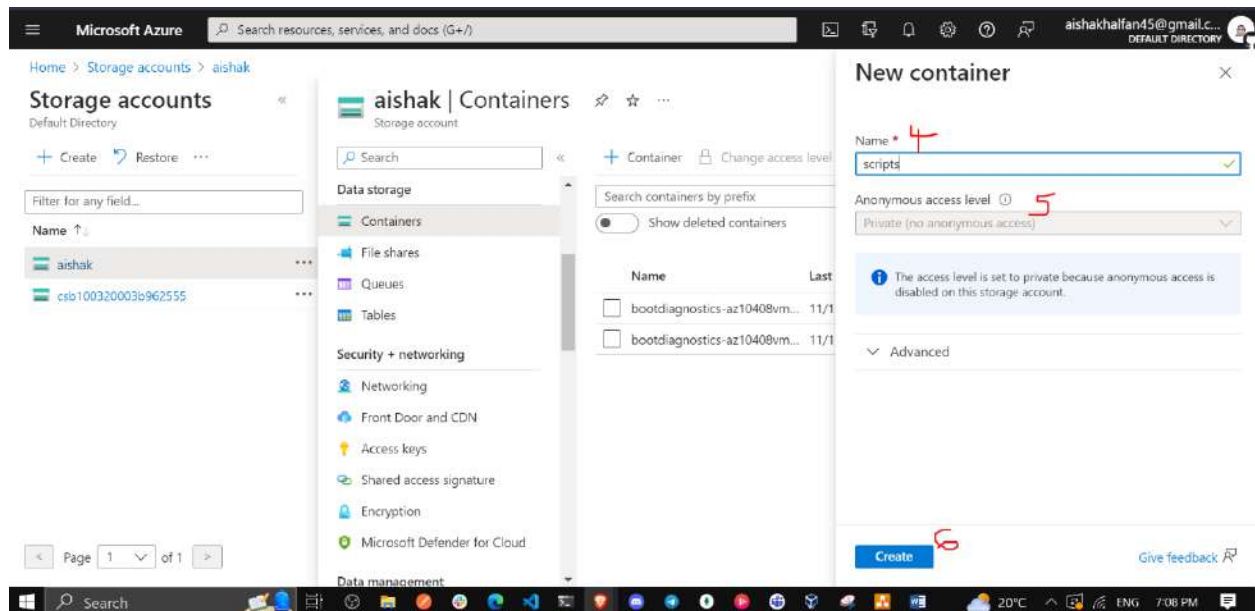


- On the storage account blade, in the **Data Storage** section, click **Containers** and then click **+ Container**.

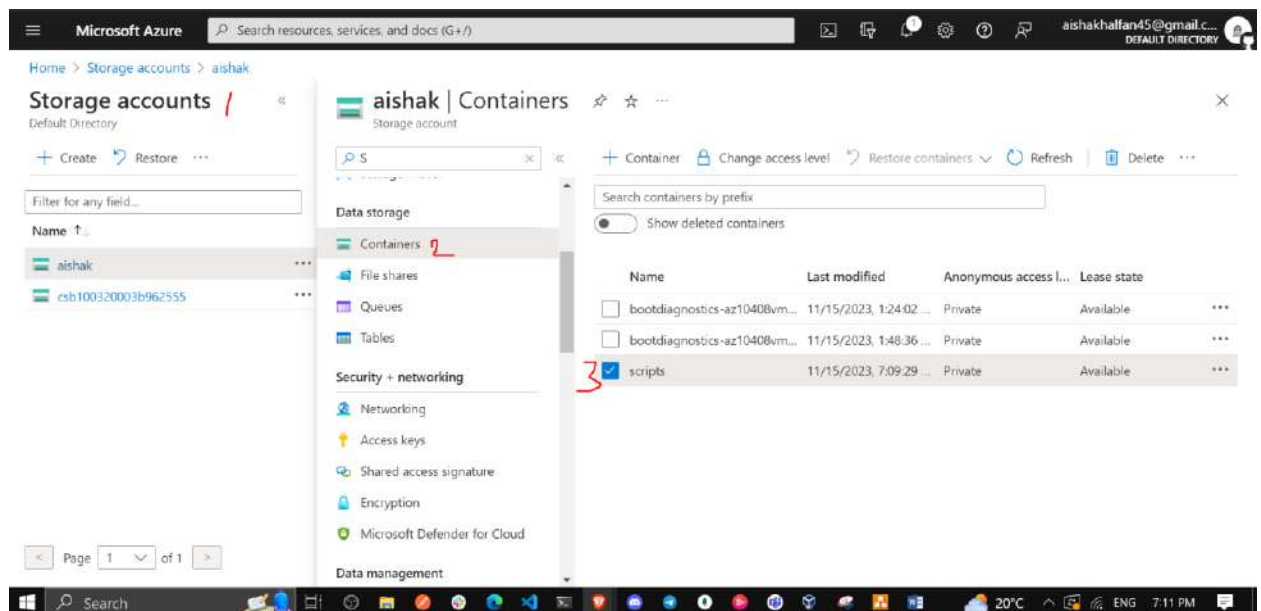


- On the **New container** blade, specify the following settings (leave others with their default values) and click **Create**:

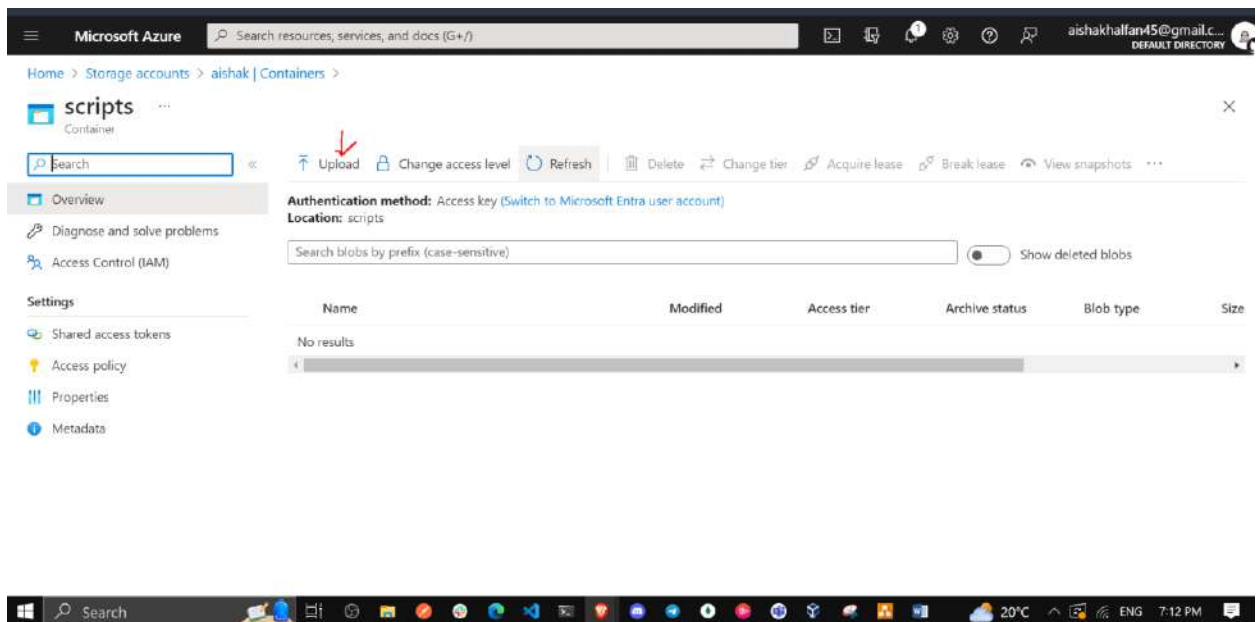
Setting	Value
Name	scripts
Public access level	Private (no anonymous access)



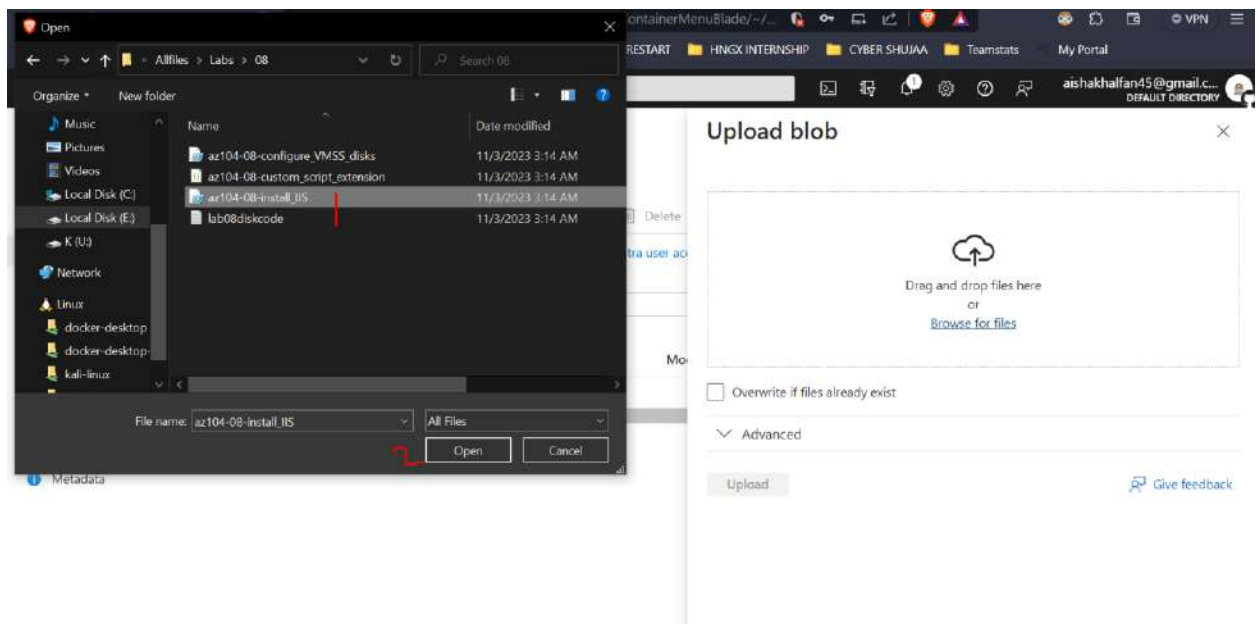
- Back on the storage account blade displaying the list of containers, click **scripts**.

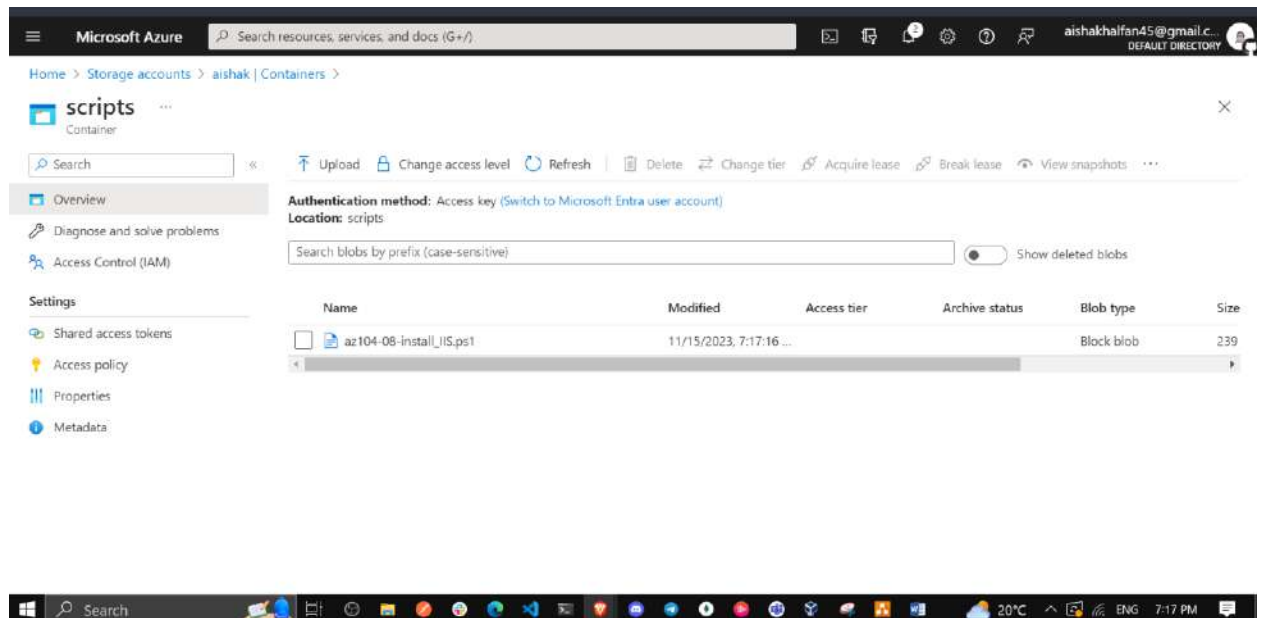
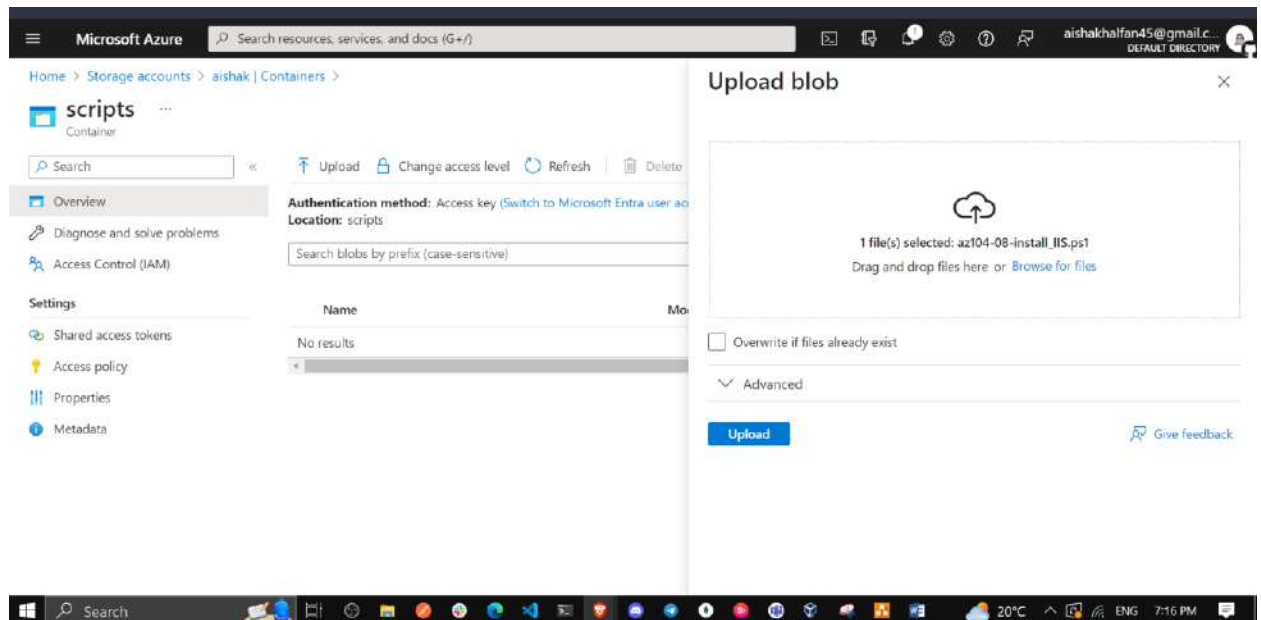


- On the **scripts** blade, click **Upload**.



6. On the **Upload blob** blade, click the folder icon, in the **Open** dialog box, navigate to the **\Allfiles\Labs\08** folder, select **az104-08-install_IIS.ps1**, click **Open**, and back on the **Upload blob** blade, click **Upload**.





7. In the Azure portal, search for and select **Virtual machines** and, on the **Virtual machines** blade, click **az104-08-vm0**.

Microsoft Azure

Search resources, services, and docs (G+)

Home > Virtual machines

Default Directory

+ Create Switch to classic Reservations Manage view Refresh Export to CSV Open query Assign tags Start Restart Stop

Filter for any field... Subscription equals all Type equals all Resource group equals all Location equals all Add filter

Showing 1 to 2 of 2 records.

Name	Type	Subscription	Resource group	Location	Status	Operating system	Size
az104-08-vm0	Virtual machine	Azure for Students	AZ104-08-RG01	East US	Running	Windows	Standard_DS1_v2
az104-08-vm1	Virtual machine	Azure for Students	az104-08-rg01	East US	Running	Windows	Standard_DS1_v2

< Previous Page 1 of 1 Next >

Give feedback

8. On the **az104-08-vm0** virtual machine blade, in the **Settings** section, click **Extensions + applications**, and then click **+ Add**.

Microsoft Azure

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Home > Virtual machines > az104-08-vm0

Virtual machines

Default Directory

+ Create Switch to classic

Filter for any field...

Name

- az104-08-vm0
- az104-08-vm1

az104-08-vm0 | Extensions + applications

Virtual machine

Search

Connect Windows Admin Center Disks Size Microsoft Defender for Cloud Advisor recommendations Extensions + applications Availability + scaling Configuration Identity Properties Locks Operations

Extensions VM Applications

+ Add Refresh Feedback

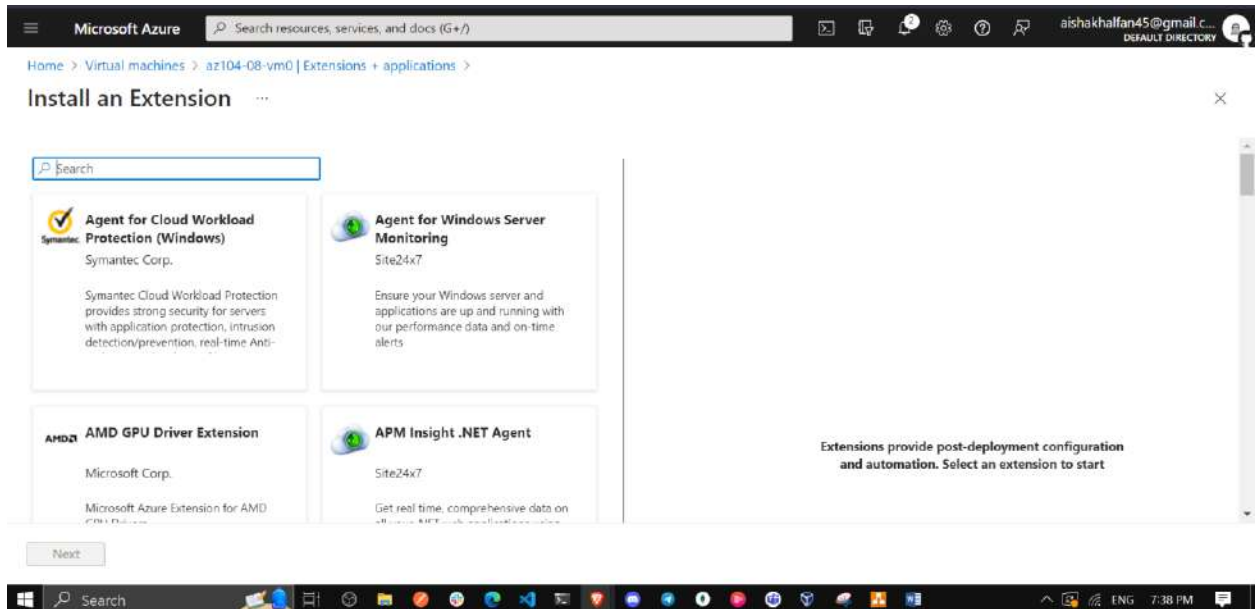
Search to filter items...

Showing all 0 items

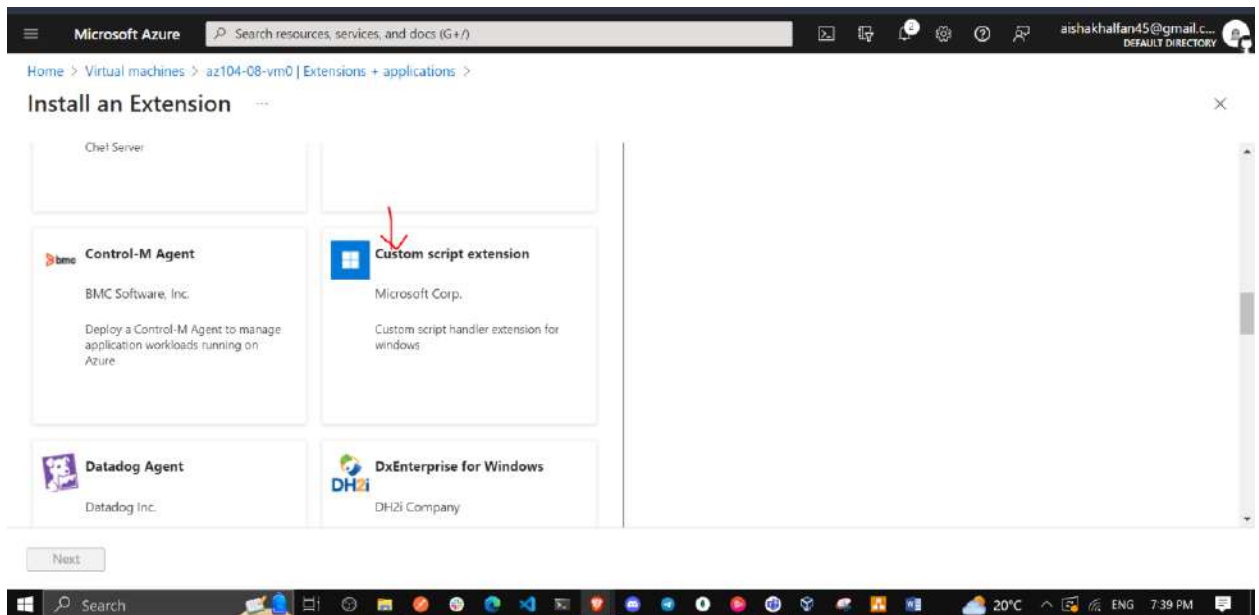
Name	Type	Version	Status
No resource extensions found.			

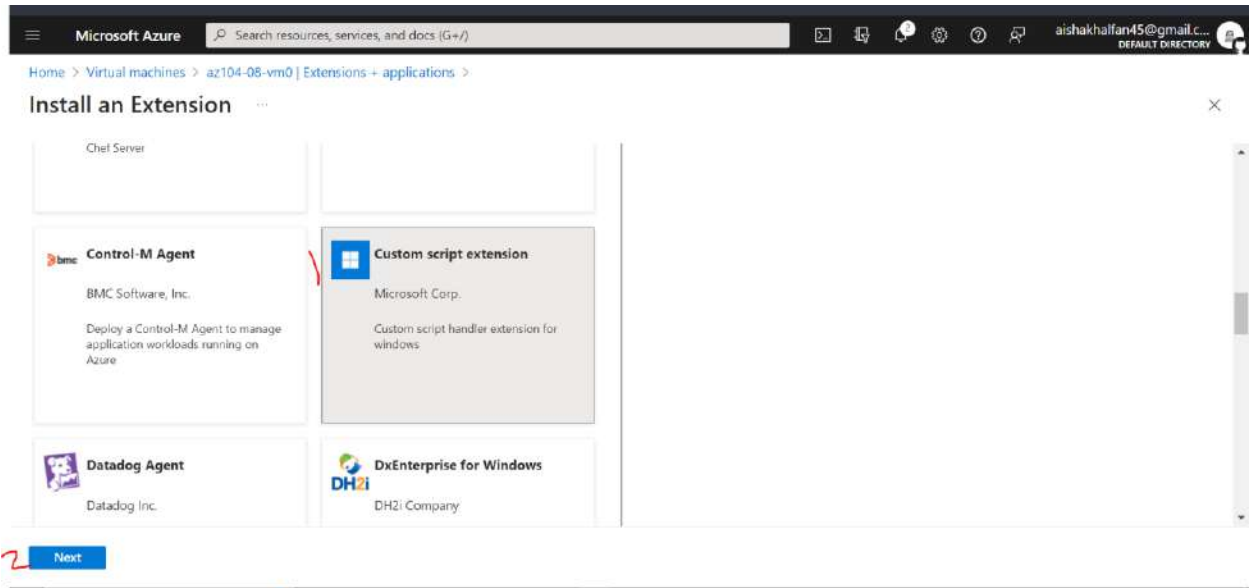
Page 1 of 1

Search 20°C ENG 7:19 PM

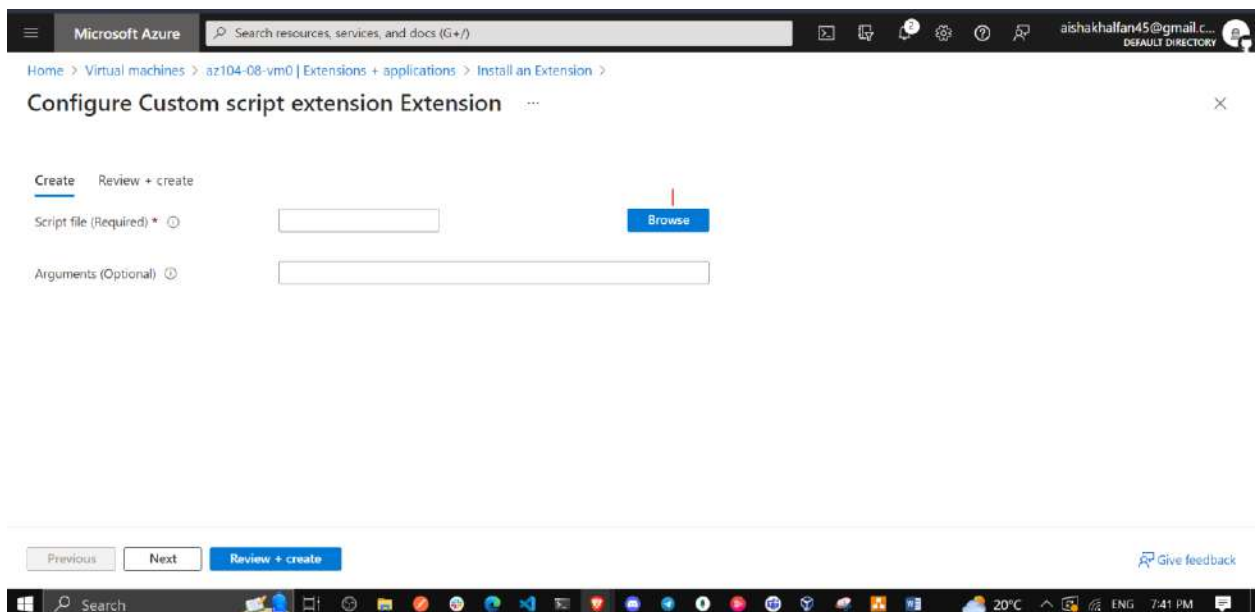


9. On the **Install an Extension** blade, click **Custom Script Extension** and then click **Next**.





10. From the **Configure Custom Script Extension Extension** blade, click **Browse**.



11. On the **Storage accounts** blade, click the name of the storage account into which you uploaded the **az104-08-install_IIS.ps1** script, on the **Containers** blade, click **scripts**, on the **scripts** blade, click **az104-08-install_IIS.ps1**, and then click **Select**.

Microsoft Azure | Search resources, services, and docs (G+)

Home > Virtual machines > az104-08-vm0 | Extensions + applications > Install an Extension > Configure Custom script extension Extension > Storage accounts >

Storage accounts

+ Storage account Refresh ...

Search storage accounts

☒ Show classic storage accounts

Name
aishak
csb100320003b962555

Containers

aishak

+ Container Refresh Give feedback

Search containers by prefix

Name	Last modified	Anonymous access level	Lease state
bootdiagnostics-az10408vm-2f5c1c5c-5de4-4c66-bdbb-5...	11/15/2023, 1:24:02 PM	Private	Available
bootdiagnostics-az10408vm-4ef33c1d-cfe0-4489-9f77-3d...	11/15/2023, 1:48:36 PM	Private	Available
scripts	11/15/2023, 7:09:29 PM	Private	Available

Microsoft Azure | Search resources, services, and docs (G+)

Home > Virtual machines > az104-08-vm0 | Extensions + applications > Install an Extension > Configure Custom script extension Extension > Storage accounts > Containers >

scripts

Container

Upload Refresh Give feedback

Authentication method: Access key (Switch to Microsoft Entra user account)

Location: scripts

Search blobs by prefix (case-sensitive)

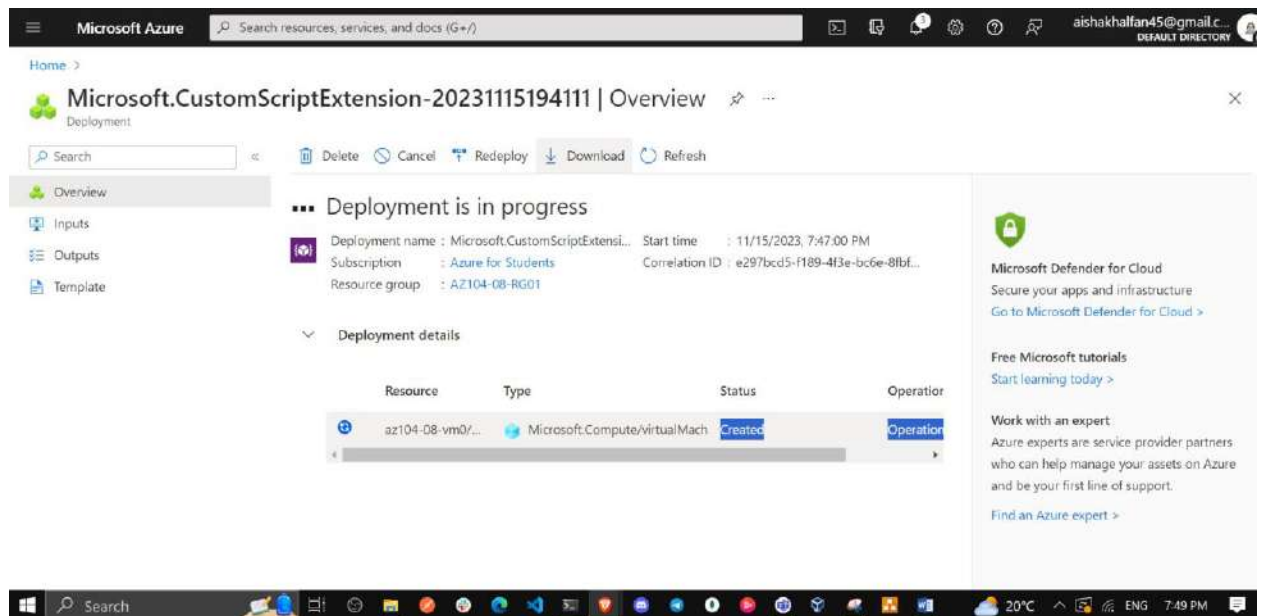
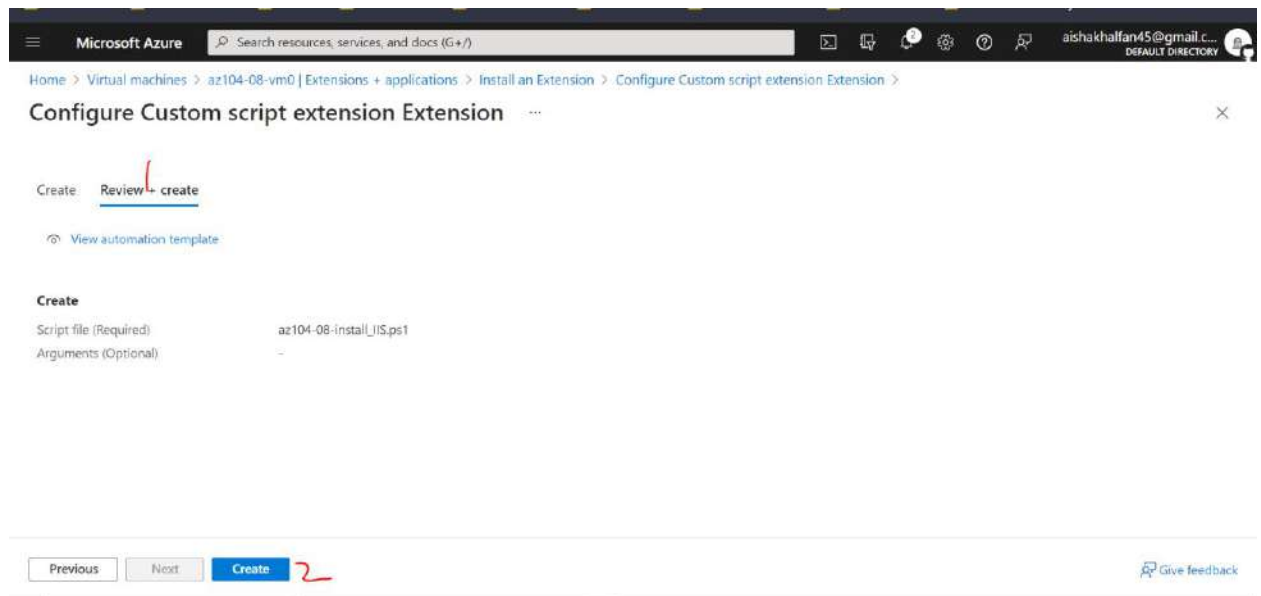
☐ Show deleted blobs

Add filter

Name	Modified	Access tier	Archive status	Blob type	Size	Lease state
az104-08-install_iis.ps1	11/15/2023, 7:17:16 PM			Block blob	239 B	Available

Select

- Back on the **Install extension** blade, click **Review + create** and, on the **Review + create** blade click **Create**.



13. In the Azure portal, search for and select **Virtual machines** and, on the **Virtual machines** blade, click **az104-08-vm1**.

Microsoft Azure | Search resources, services, and docs (G+)

Home > Virtual machines

Default Directory

+ Create | Switch to classic | Reservations | Manage view | Refresh | Export to CSV | Open query | Assign tags | Start | Restart | Stop

Filter for any field... | Subscription equals all | Type equals all | Resource group equals all | Location equals all | Add filter

Showing 1 to 2 of 2 records. | No grouping | List view

Name	Type	Subscription	Resource group	Location	Status	Operating system	Size
az104-08-vm0	Virtual machine	Azure for Students	AZ104-08-RG01	East US	Running	Windows	Standard_DS1_v2
az104-08-vm1	Virtual machine	Azure for Students	az104-08-rg01	East US	Running	Windows	Standard_DS1_v2

< Previous | Page 1 of 1 | Next >

Give feedback

- On the **az104-08-vm1** blade, in the **Automation** section, click **Export template**.

Microsoft Azure | Search resources, services, and docs (G+)

Home > Virtual machines > az104-08-vm1

Virtual machines

Default Directory

+ Create | Switch to classic

Filter for any field...

Name

- az104-08-vm0
- az104-08-vm1

az104-08-vm1 | Export template

Virtual machine

Search | Download | Add to library | Deploy | Visualize template

Workbooks

Automation

- Tasks (preview)
- Export template

Help

- Resource health
- Boot diagnostics
- Performance diagnostics
- VM Inspector (Preview)
- Reset password
- Redeploy + reapply
- Serial console

Page 1 of 1

To export related resources, select the resources from the Resource Group view then select the "Export template" option from the tool bar.

☒ Include parameters

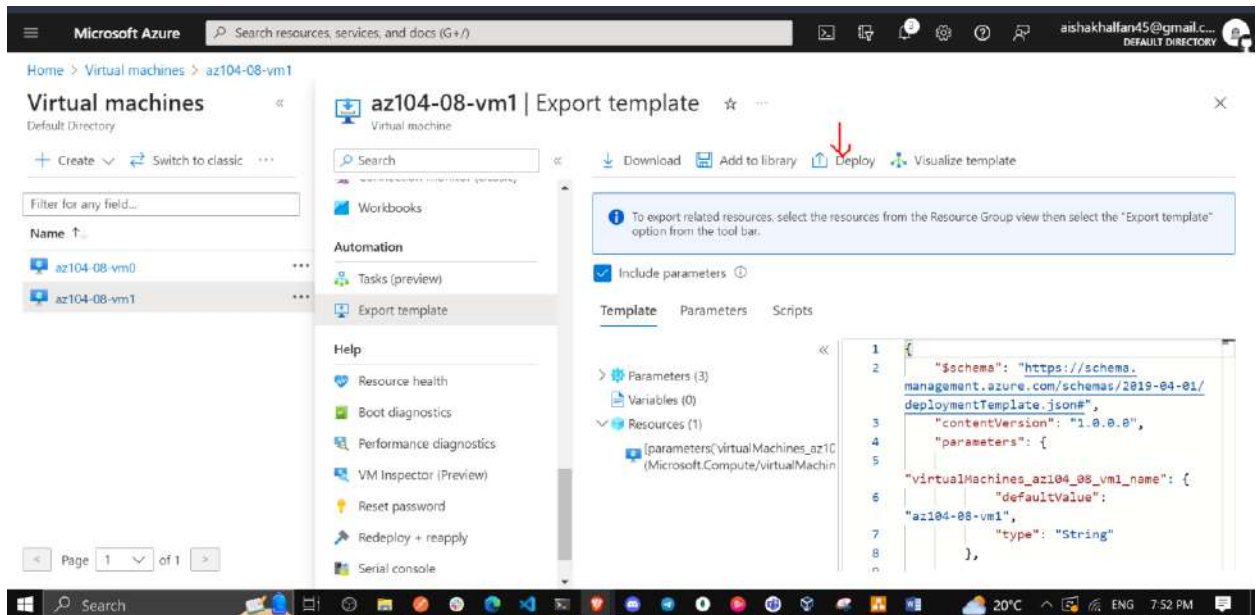
Template | Parameters | Scripts

```

1 {
2   "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
3   "contentVersion": "1.0.0.0",
4   "parameters": {
5     "virtualMachines_az104_08_vm1_name": {
6       "defaultValue": "az104-08-vm1",
7       "type": "String"
8     }
9   }

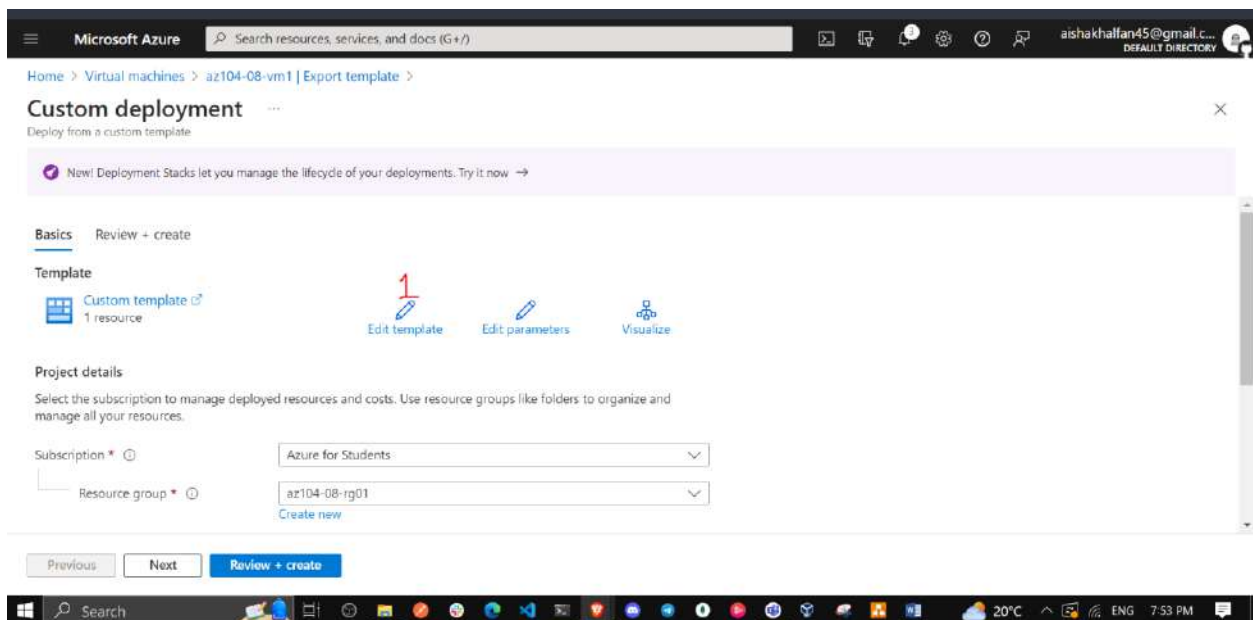
```

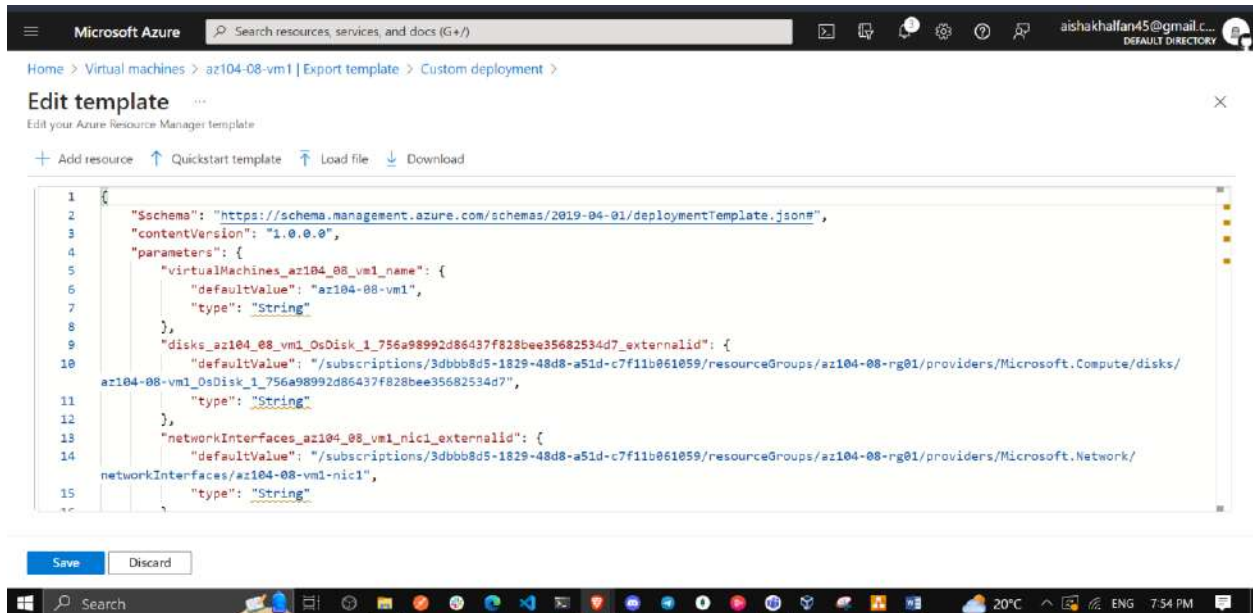
- On the **az104-08-vm1 - Export template** blade, click **Deploy**.



16. On the **Custom deployment** blade, click **Edit template**.

Note: Disregard the message stating **The resource group is in a location that is not supported by one or more resources in the template. Please choose a different resource group.** This is expected and can be ignored in this case.





17. On the **Edit template** blade, in the section displaying the content of the template, insert the following code starting with line **20** (directly underneath the **"resources": [** line):

Note: If you are using a tool that pastes the code in line by line intellisense may add extra brackets causing validation errors. You may want to paste the code into notepad first and then paste it into line 20.

```
{
  "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)"
    }
  }
}
```

```
},
}
```

Note: This section of the template defines the same Azure virtual machine custom script extension that you deployed earlier to the first virtual machine via Azure PowerShell.

The top screenshot shows the 'Edit template' blade in the Microsoft Azure portal. The breadcrumb navigation is 'Home > Virtual machines > az104-08-vm1 | Export template > Custom deployment >'. The page title is 'Edit template' with a subtitle 'Edit your Azure Resource Manager template'. Below the title are links for '+ Add resource', '↑ Quickstart template', '↑ Load file', and '↓ Download'. The main area displays a JSON template snippet for a virtual machine resource, with line numbers 19 through 35 on the left. The snippet defines a virtual machine with properties like hardwareProfile, additionalCapabilities, and storageProfile. At the bottom are 'Save' and 'Discard' buttons. The Windows taskbar at the bottom shows the time as 7:56 PM.

The bottom screenshot shows the same 'Edit template' blade, but with a different JSON snippet. The breadcrumb navigation is 'Home > Virtual machines > az104-08-vm1 | Export template > Custom deployment >'. The page title is 'Edit template' with a subtitle 'Edit your Azure Resource Manager template'. Below the title are links for '+ Add resource', '↑ Quickstart template', '↑ Load file', and '↓ Download'. The main area displays a JSON template snippet for a custom script extension resource, with line numbers 18 through 34 on the left. The snippet defines a custom script extension with properties like publisher, type, typeHandlerVersion, autoUpgradeMinorVersion, and settings. At the bottom are 'Save' and 'Discard' buttons. The Windows taskbar at the bottom shows the time as 7:57 PM.

18. Click **Save** and, back on the **Custom template** blade, click **Review + Create** and, on the **Review + Create** blade, click **Create**

Note: Wait for the template deployment to complete. You can monitor its progress from the **Extensions** blade of the **az104-08-vm0** and **az104-08-vm1** virtual machines. This should take no more than 3 minutes.

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the Microsoft Azure logo, a search bar, and user information. The breadcrumb trail indicates the path: Home > Virtual machines > az104-08-vm1 | Export template > Custom deployment.

Edit template

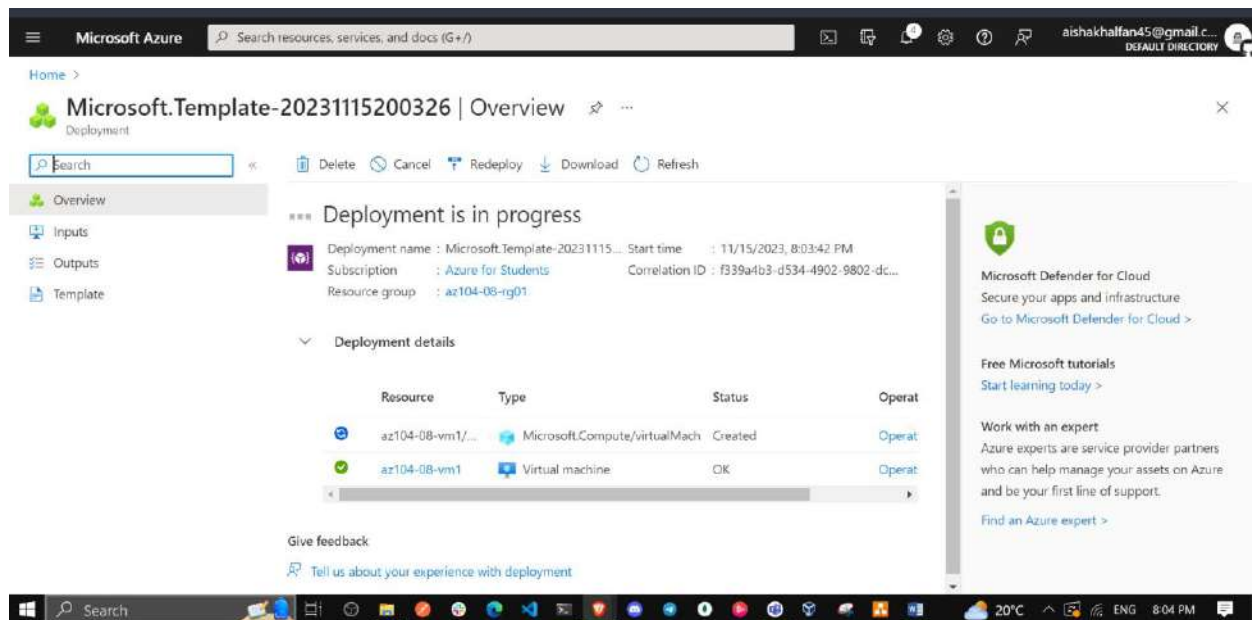
Edit your Azure Resource Manager template.

+ Add resource ↑ Quickstart template ↕ Load file ↓ Download

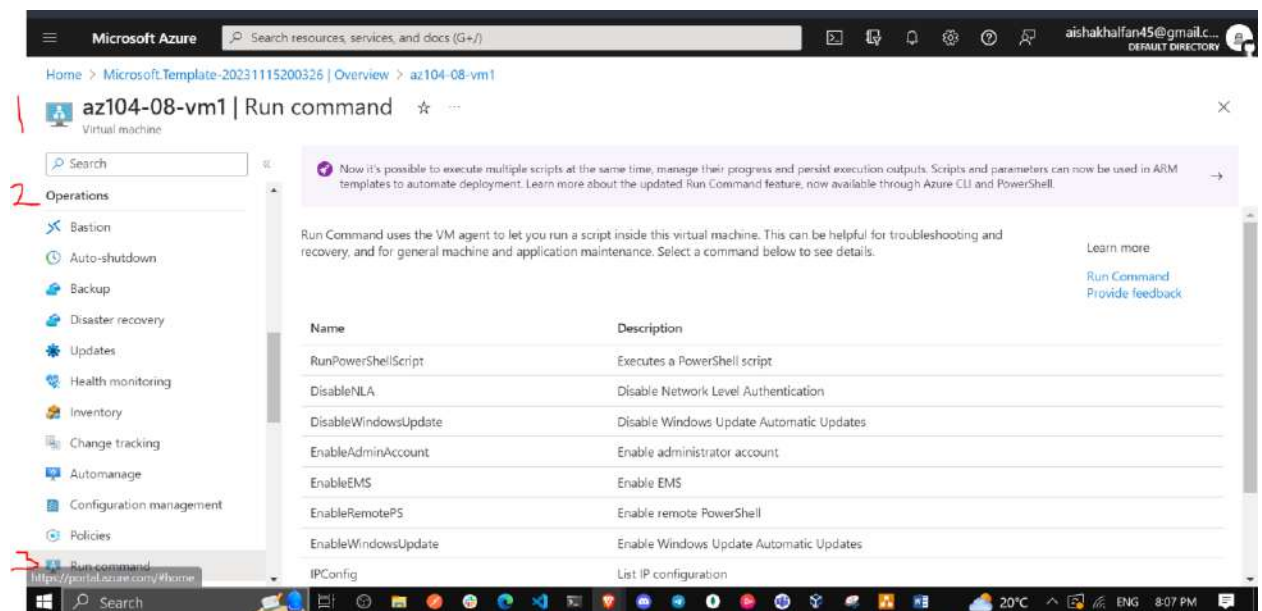
```
103      "id": "[parameters('networkInterfaces_az104_08_vm1_nic1_externalid')]",
104      "properties": {
105        "deleteOption": "Detach"
106      }
107    },
108  },
109  },
110  "diagnosticsProfile": {
111    "bootDiagnostics": {
112      "enabled": true,
113      "storageUri": "https://aishak.blob.core.windows.net/"
114    }
115  }
116  },
117  },
118  },
119  }
```

Save **Discard**

The bottom section of the screenshot shows the 'Custom deployment' page. It includes a notification about Deployment Stacks, tabs for 'Basics' and 'Review + create', and a 'Template' section with a 'Customized template' icon and '2 resources'. The 'Project details' section allows selecting a subscription and resource group. The 'Subscription' dropdown is set to 'Azure for Students', and the 'Resource group' dropdown is set to 'az104-08-rg01'. At the bottom, there are 'Previous', 'Next', and 'Review + create' buttons.



19. 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**.



20. On the **Run Command Script** blade, type the following and click **Run** to access the web site hosted on **az104-08-vm1**:

`Invoke-WebRequest -URI http://10.80.0.4 -UseBasicParsing`

Note: The **-UseBasicParsing** parameter is necessary to eliminate dependency on Internet Explorer to complete execution of the cmdlet

Microsoft Azure Search resources, services, and docs (G+)

Home > Microsoft.Template-20231115200326 | Overview > az104-08-vm1 | Run command

Virtual machine

Operations

- Bastion
- Auto-shutdown
- Backup
- Disaster recovery
- Updates
- Health monitoring
- Inventory
- Change tracking
- Automanage
- Configuration management
- Policies
- Run command

Now it's possible to templates to auton

Run Command uses the recovery, and for genera

Name

- RunPowerShellScript
- DisableNLA
- DisableWindowsUpdat
- EnableAdminAccount
- EnableEMS
- EnableRemotePS
- EnableWindowsUpdate
- IPConfig

Run

Run Command Script

RunPowerShellScript

PowerShell Script

```
1 |
```

Microsoft Azure Search resources, services, and docs (G+)

Home > Microsoft.Template-20231115200326 | Overview > az104-08-vm1 | Run command

Virtual machine

Operations

- Bastion
- Auto-shutdown
- Backup
- Disaster recovery
- Updates
- Health monitoring
- Inventory
- Change tracking
- Automanage
- Configuration management
- Policies
- Run command

Now it's possible to templates to auton

Run Command uses the recovery, and for genera

Name

- RunPowerShellScript
- DisableNLA
- DisableWindowsUpdat
- EnableAdminAccount
- EnableEMS
- EnableRemotePS
- EnableWindowsUpdate
- IPConfig

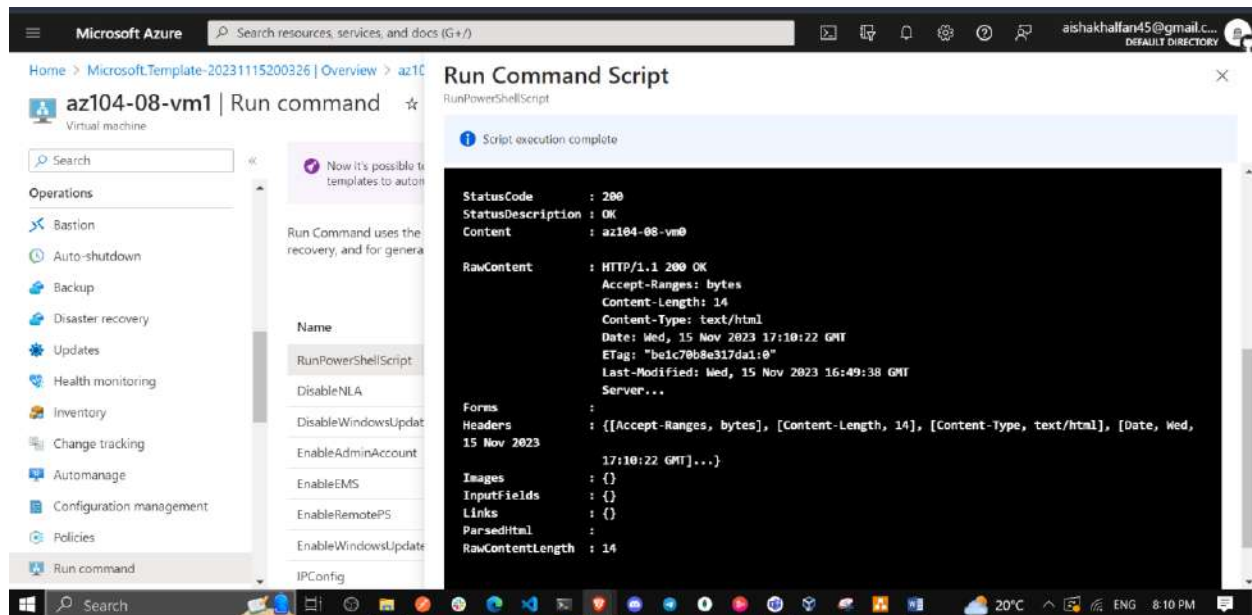
Run

Run Command Script

RunPowerShellScript

PowerShell Script

```
1 Invoke-WebRequest -URI http://10.80.0.4 -UseBasicParsing
```



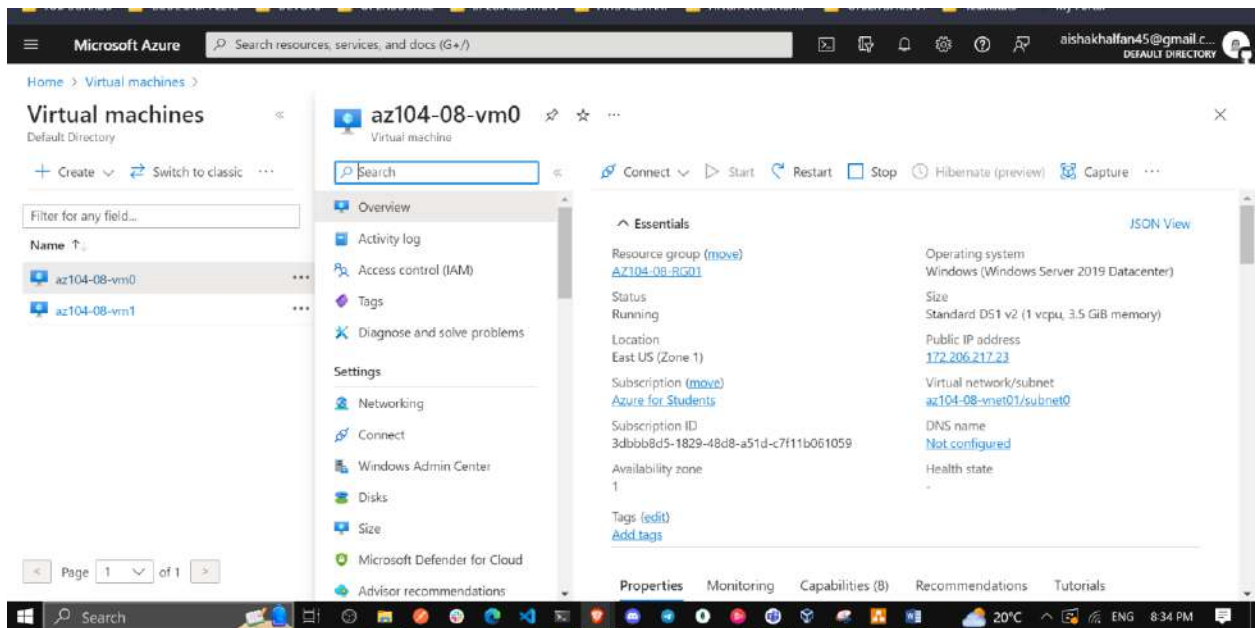
Note: The `-URI` parameter is the **Private IP address** of the VM. Navigate to the **az104-08-vm1** blade, in the **Networking** section, and click **Network settings**

Note: 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**.

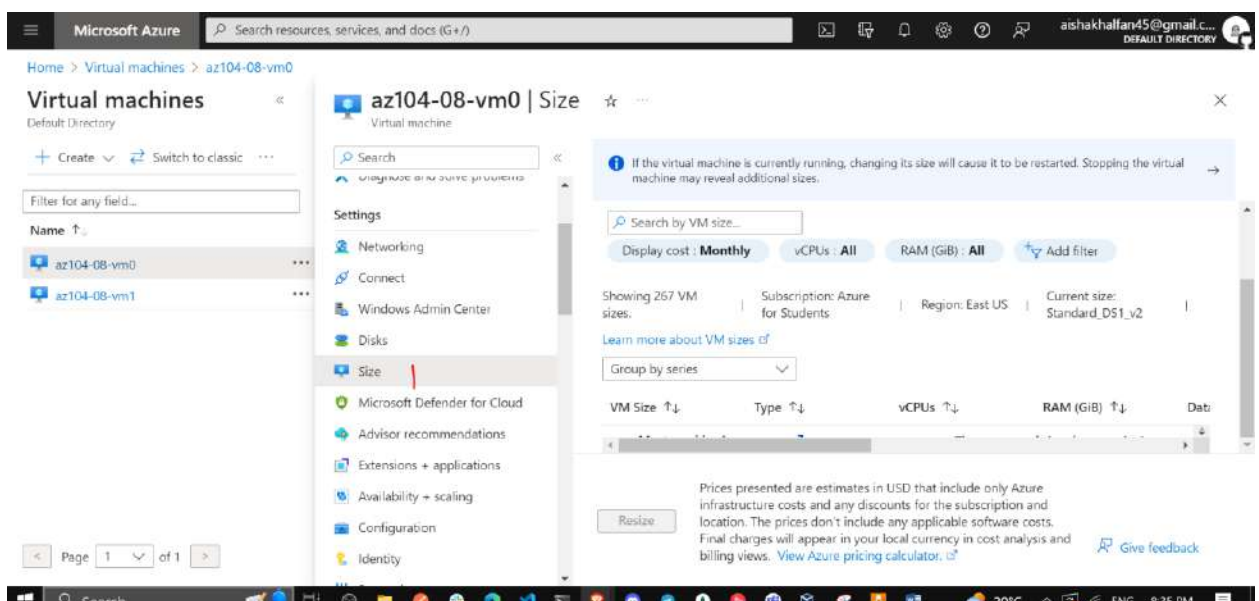
Task 3: Scale compute and storage for Azure virtual machines

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

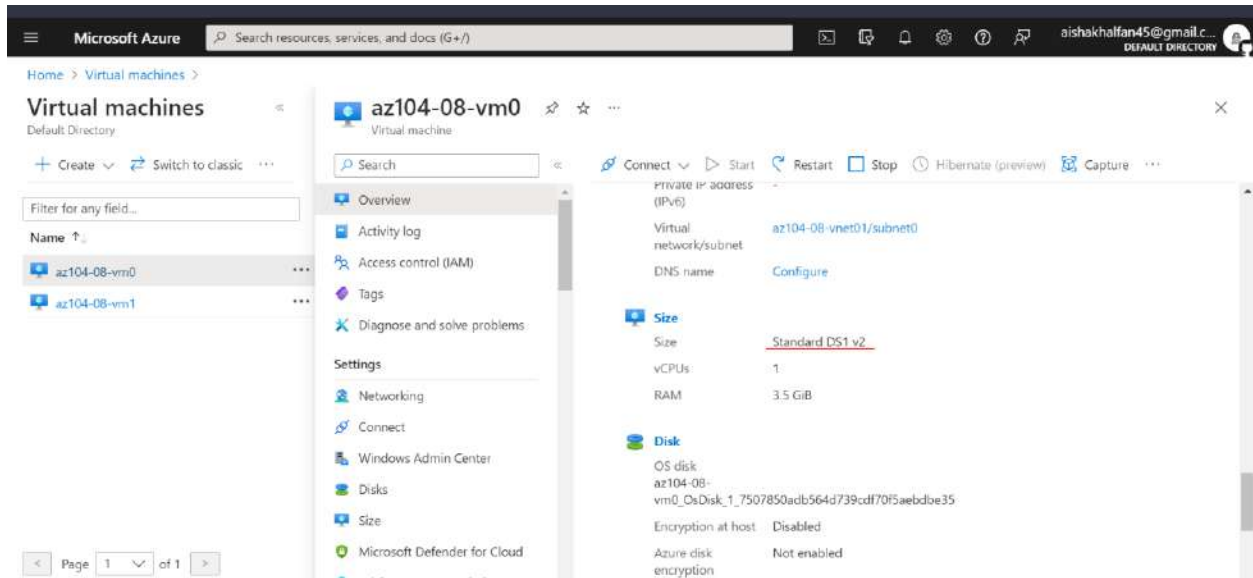
1. In the Azure portal, search for and select **Virtual machines** and, on the **Virtual machines** blade, click **az104-08-vm0**.



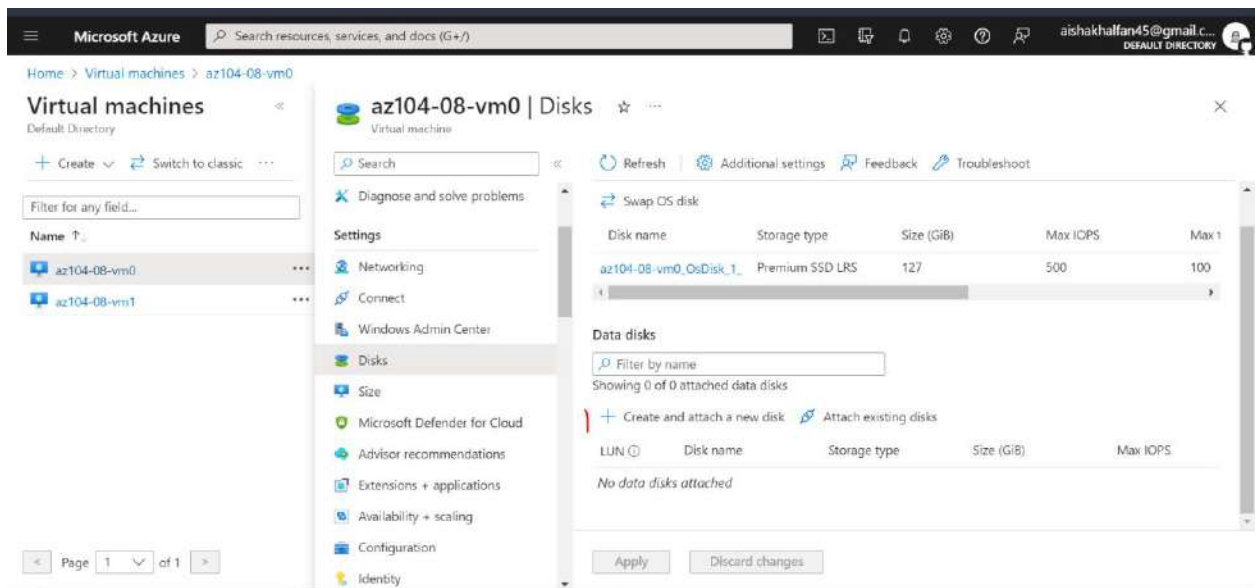
- On the **az104-08-vm0** virtual machine blade, click **Size** and set the virtual machine size to **Standard DS1_v2** and click **Resize**



Note: Choose another size if **Standard DS1_v2** is not available.

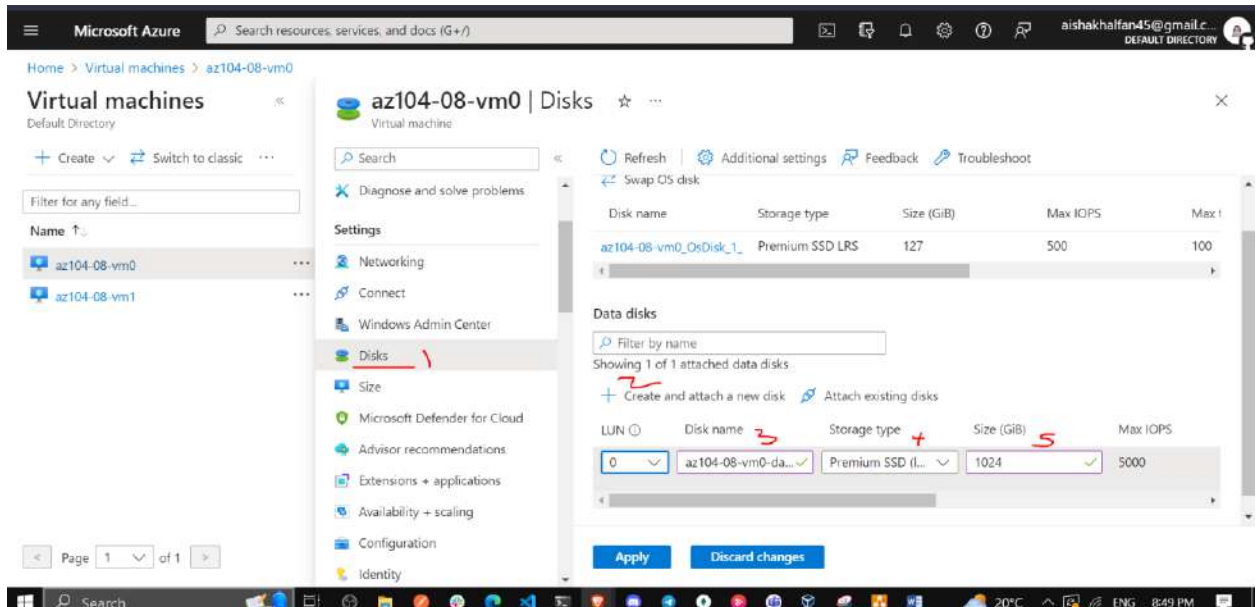


- On the **az104-08-vm0** virtual machine blade, click **Disks**, Under **Data disks** click **+ Create and attach a new disk**.



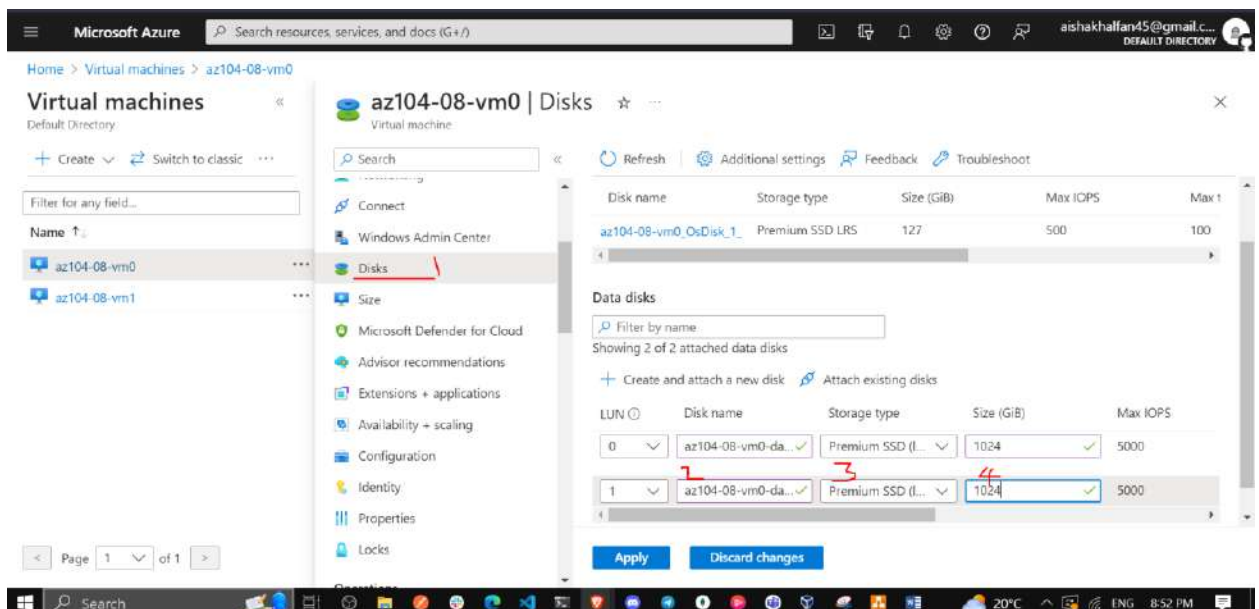
- Create a managed disk with the following settings (leave others with their default values):

Setting	Value
Disk name	az104-08-vm0-datadisk-0
Storage type	Premium SSD
Size (GiB)	1024



5. Back on the **az104-08-vm0 - Disks** blade, Under **Data disks** click **+ Create and attach a new disk**.
6. Create a managed disk with the following settings (leave others with their default values) and Save changes:

Setting	Value
Disk name	az104-08-vm0-datadisk-1
Storage type	Premium SSD
Size (GiB)	1024 GiB



7. Back on the **az104-08-vm0 - Disks** blade, click **Save**.

Microsoft Azure | Search resources, services, and docs (G+)

Home > Virtual machines > az104-08-vm0

Virtual machines

Default Directory

+ Create | Switch to classic

Filter for any field...

Name ↑

- az104-08-vm0
- az104-08-vm1

Page 1 of 1

az104-08-vm0 | Disks

Virtual machine

Search | Refresh | Additional settings | Feedback | Troubleshoot

Run command

Monitoring

- Insights
- Alerts
- Metrics
- Diagnostics settings
- Logs
- Connection monitor (classic)
- Workbooks

Automation

- Tasks (preview)
- Export template

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
0	az104-08-vm0-da...	Premium SSD (L...	1024	5000
1	az104-08-vm0-da...	Premium SSD (L...	1024	5000

Apply | Discard changes

8. On the **az104-08-vm0** blade, in the **Operations** section, click **Run command**, and, in the list of commands, click **RunPowerShellScript**.

Microsoft Azure | Search resources, services, and docs (G+)

Home > Virtual machines > az104-08-vm0

Virtual machines

Default Directory

+ Create | Switch to classic

Filter for any field...

Name ↑

- az104-08-vm0
- az104-08-vm1

Page 1 of 1

az104-08-vm0 | Run command

Virtual machine

Search

Operations

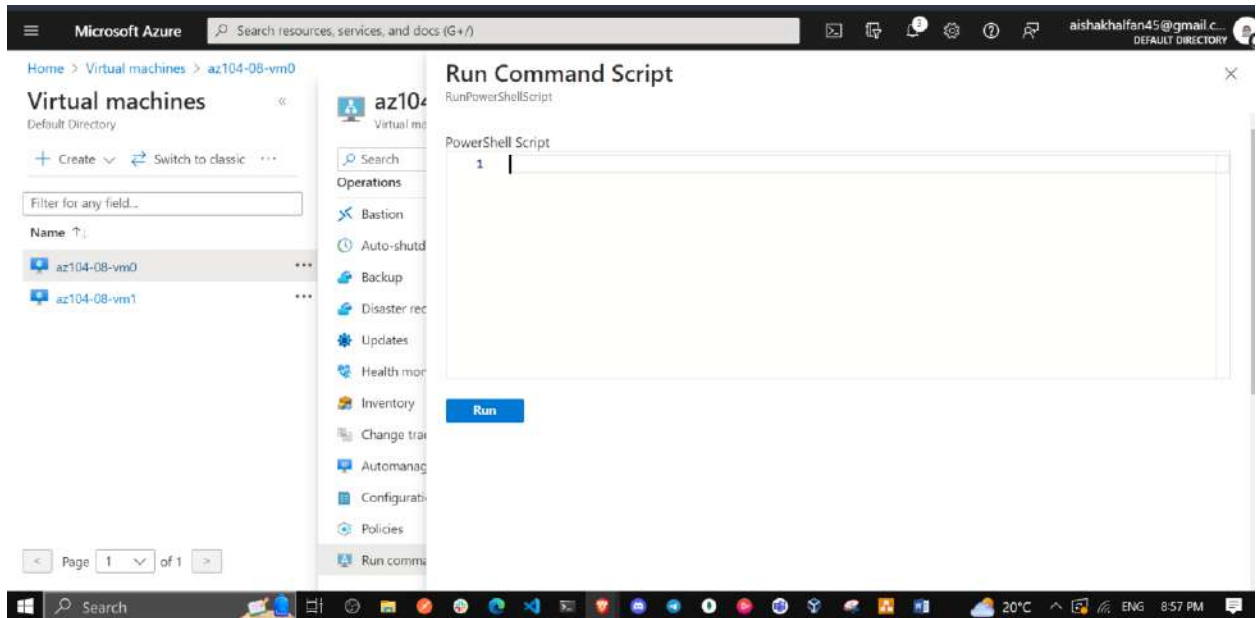
- Bastion
- Auto-shutdown
- Backup
- Disaster recovery
- Updates
- Health monitoring
- Inventory
- Change tracking
- Automanage
- Configuration management
- Policies
- Run command

Now it's possible to execute multiple scripts at the same time, manage their progress and persist execution outputs. Scripts and parameters can now be used in ARM templates to automate deployment. Learn more about the updated Run Command feature, now available through Azure CLI and PowerShell.

Run Command uses the VM agent to let you run a script inside this virtual machine. This can be helpful for troubleshooting and recovery, and for general machine and application maintenance. Select a command below to see details. [Learn more](#)

Name	Description
RunPowerShellScript	Executes a PowerShell script
DisableNLA	Disable Network Level Authentication
DisableWindowsUpdate	Disable Windows Update Automatic Updates
EnableAdminAccount	Enable administrator account
EnableEMS	Enable EMS
EnableRemotePS	Enable remote PowerShell
EnableWindowsUpdate	Enable Windows Update Automatic Updates

[Run Command](#) | [Provide feedback](#)



9. On the **Run Command Script** blade, type the following and click **Run** to create a drive Z: consisting of the two newly attached disks with the simple layout and fixed provisioning:

```
New-StoragePool -FriendlyName storagepool1 -StorageSubsystemFriendlyName "Windows Storage*" -PhysicalDisks (Get-PhysicalDisk -CanPool $true)
```

```
New-VirtualDisk -StoragePoolFriendlyName storagepool1 -FriendlyName virtualdisk1 -Size 64GB -ResiliencySettingName Simple -ProvisioningType Fixed
```

```
Initialize-Disk -VirtualDisk (Get-VirtualDisk -FriendlyName virtualdisk1)
```

```
New-Partition -DiskNumber 4 -UseMaximumSize -DriveLetter
```

Note: Wait for the confirmation that the commands completed successfully.

Microsoft Azure Search resources, services, and docs (G+)

Home > Virtual machines > az104-08-vm0

Virtual machines

Default Directory

+ Create - Switch to classic

Filter for any field...

Name ↑

- az104-08-vm0
- az104-08-vm1

Page 1 of 1

Run Command Script

RunPowerShellScript

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

Microsoft Azure Search resources, services, and docs (G+)

Home > Virtual machines > az104-08-vm0

Virtual machines

Default Directory

+ Create - Switch to classic

Filter for any field...

Name ↑

- az104-08-vm0
- az104-08-vm1

Page 1 of 1

Run Command Script

RunPowerShellScript

Script execution complete.

```
DiskNumber : 4
DriveLetter : Z
GptType : {ebd090a2-b9e5-4433-87c0-68b6b72699c7}
Guid : {8007f8f7-4136-4807-9693-59233d26c74c}
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 : 68701650944
TransitionState : 1
PSComputerName :
Type : Basic
DiskPath : \\?\storage\disk#{c31aa817-ed95-4026-bbf5-6a9e558ec850}#{53f56387-b6bf-11d0-94f2-00a0c91efb8b}
```

Microsoft Azure Search resources, services, and docs (G+)

Home > Virtual machines > az104-08-vm0

Virtual machines

Default Directory

+ Create - Switch to classic ...

Filter for any field...

Name ↑

- az104-08-vm0
- az104-08-vm1

Page 1 of 1

Operations

- Bastion
- Auto-shutdown
- Backup
- Disaster recovery
- Updates
- Health monitoring
- Inventory
- Change tracking
- Automated updates
- Configuration
- Policies
- Run command

Run Command Script

Run PowerShell Script

Script execution complete

```
FriendlyName OperationalStatus HealthStatus IsPrimordial IsReadOnly Size AllocatedSize
-----
storagepool1 OK Healthy False False 2 TB 512 MB

ObjectID
-----
S_VirtualDisk.0b

jectId="24c61a4c-83a1-11ee-af29-806e6f6e6963":VD:[15f94249-c0bc-4b
18-bb47-824c6df8
033e]{c31aa817-ed95-4026-bbfb-6a9e558ec850}"

PassThroughClass
-----
PassThroughId
-----
PassThroughNamespace
-----
PassThroughServer
-----
UniqueId
-----
Access
-----
AllocatedSize
-----
AllocationUnitSize
-----
ColumnIsolation
-----
DetachedReason
-----
FaultDomainAwareness
-----
FootprintOnPool
-----
FriendlyName
-----
HealthStatus
-----
```

20°C ENG 9:01 PM

Microsoft Azure Search resources, services, and docs (G+)

Home > Virtual machines > az104-08-vm0

Virtual machines

Default Directory

+ Create - Switch to classic ...

Filter for any field...

Name ↑

- az104-08-vm0
- az104-08-vm1

Page 1 of 1

Operations

- Bastion
- Auto-shutdown
- Backup
- Disaster recovery
- Updates
- Health monitoring
- Inventory
- Change tracking
- Automated updates
- Configuration
- Policies
- Run command

Run Command Script

Run PowerShell Script

Script execution complete

```
HealthStatus
-----
Interleave
-----
IsDeduplicationEnabled
-----
IsEnclosureAware
-----
IsManualAttach
-----
IsSnapshot
-----
IsTiered
-----
LogicalSectorSize
-----
MediaType
-----
Name
-----
NameFormat
-----
NumberOfAvailableCopies
-----
NumberOfColumns
-----
NumberOfDataCopies
-----
NumberOfGroups
-----
OperationalStatus
-----
OtherOperationalStatusDescription
-----
OtherUsageDescription
-----
ParityLayout
-----
PhysicalDiskRedundancy
-----
PhysicalSectorSize
-----
ProvisioningType
-----
ReadCacheSize
-----
RequestNoSinlinePointOfFailure
-----
```

20°C ENG 9:02 PM

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

Home > Virtual machines > az104-08-vm0

Virtual machines
Default Directory

+ Create ▾ Switch to classic ▾

Filter for any field...

Name ↑

- az104-08-vm0
- az104-08-vm1

Page 1 of 1

Run Command Script
RunPowerShellScript

Script execution complete

```

ResiliencySettingName : Simple
Size                  : 6871947636
UniqueIdFormat        : Vendor Specific
UniqueIdFormatDescription :
Usage                 : Data
WriteCacheSize         : 0
PSComputerName         :

ObjectId              : {1}\az104-08-vm0\root\Microsoft\Windows\Storage\Providers_v2\WSP_Partition.ObjectId="{24c61a4c-83a1-11ee-af29-806e6f6c6963}";PR:{00000000-0000-0000-0000-000100000000}\\?\storage#{c31aa817-ed95-4026-bbfb-6a9e558ec850}#(53f56307-b6bf-11d0-94f2-00a0c91efb8b)"
e#disk#{c31aa817-ed95-4026-bbfb-6a9e558ec850}#(53f56307-b6bf-11d0-94f2-00a0c91efb8b)"

PassThroughClass      :
PassThroughIds         :
PassThroughNamespace   :
PassThroughServer      :
UniqueId              : {00000000-0000-0000-0000-000100000000}17A81AC395ED264088F86A9E558EC850
AccessPaths            : {Z:\, \\?\Volume{8007f8f7-4136-4807-9693-59233d26c74c}\}
DiskId                 : \\?\storage#disk#{c31aa817-ed95-4026-bbfb-6a9e558ec850}#(53f56307-b6bf-11d0-94f2-00a0c91efb8b)
DiskNumber             : 4
DriveLetter            : Z
  
```

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

Home > Virtual machines > az104-08-vm0

Virtual machines
Default Directory

+ Create ▾ Switch to classic ▾

Filter for any field...

Name ↑

- az104-08-vm0
- az104-08-vm1

Page 1 of 1

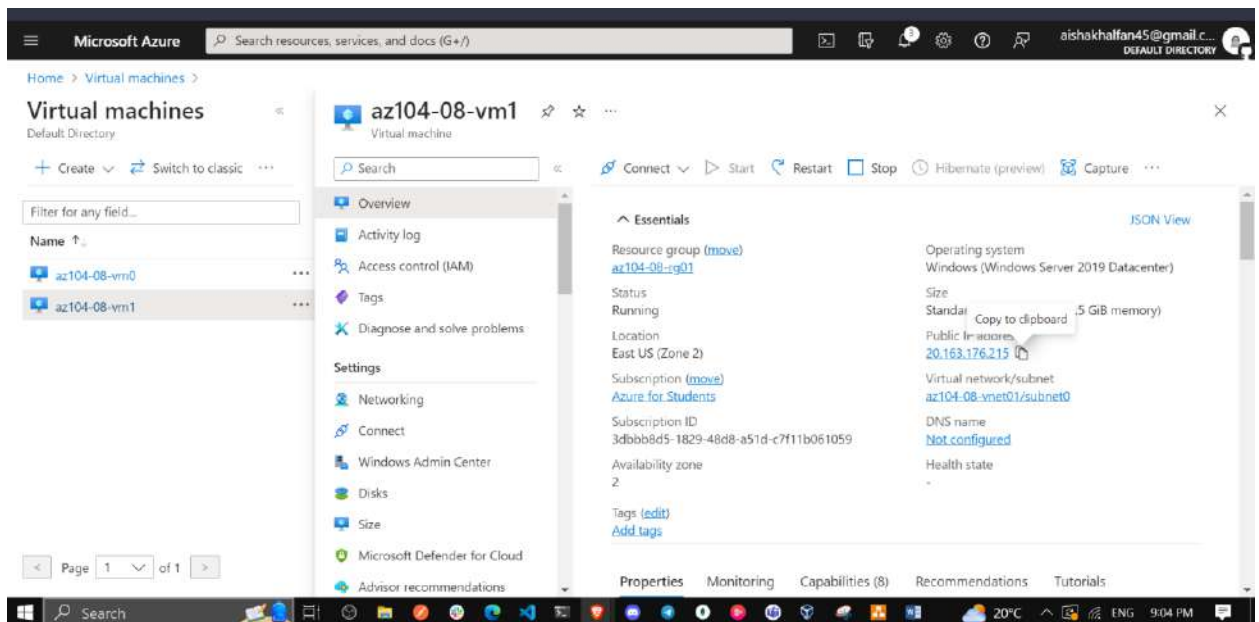
Run Command Script
RunPowerShellScript

Script execution complete

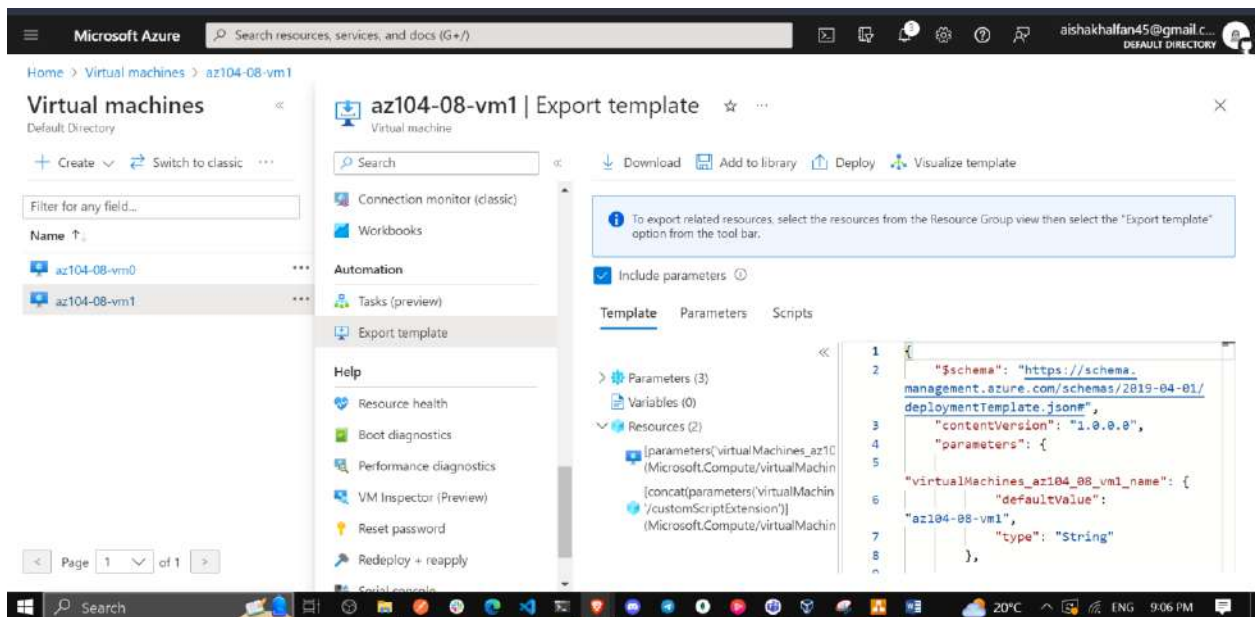
```

DriveLetter           : Z
GptType                : {ebd000a2-b9e5-4433-87c0-68b6b72699c7}
Guid                   : {8007f8f7-4136-4807-9693-59233d26c74c}
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                   : 68701650944
TransitionState         : 1
PSComputerName         :
Type                   : Basic
DiskPath               : \\?\storage#disk#{c31aa817-ed95-4026-bbfb-6a9e558ec850}#(53f56307-b6bf-11d0-94f2-00a0c91efb8b)
  
```

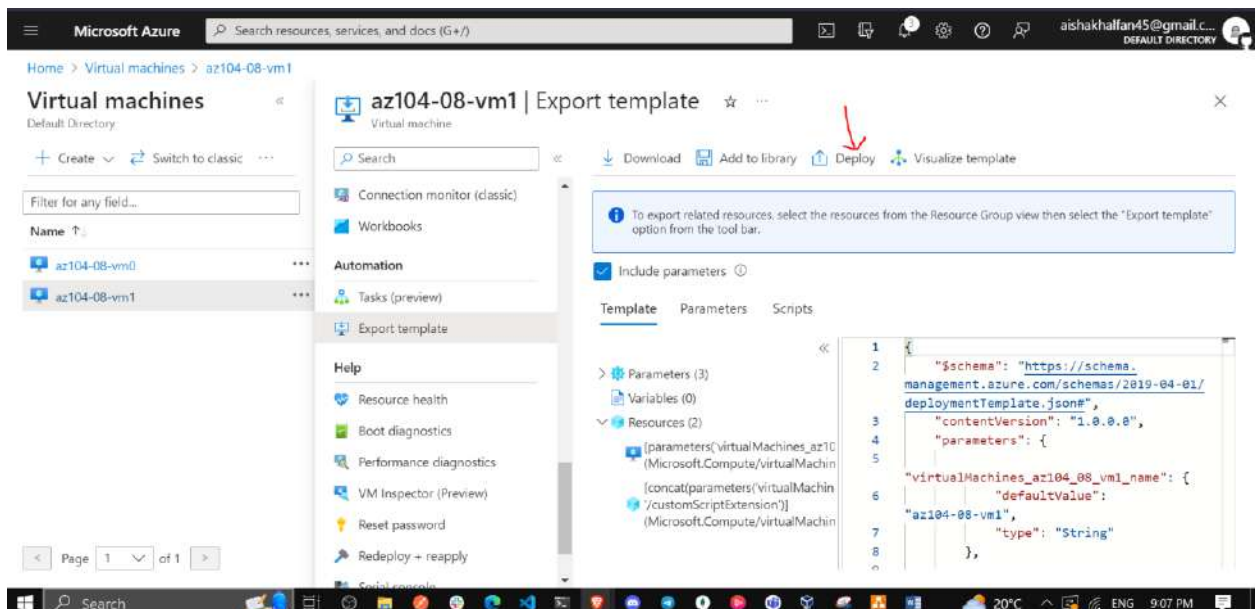
- In the Azure portal, search for and select **Virtual machines** and, on the **Virtual machines** blade, click **az104-08-vm1**.



11. On the **az104-08-vm1** blade, in the **Automation** section, click **Export template**.

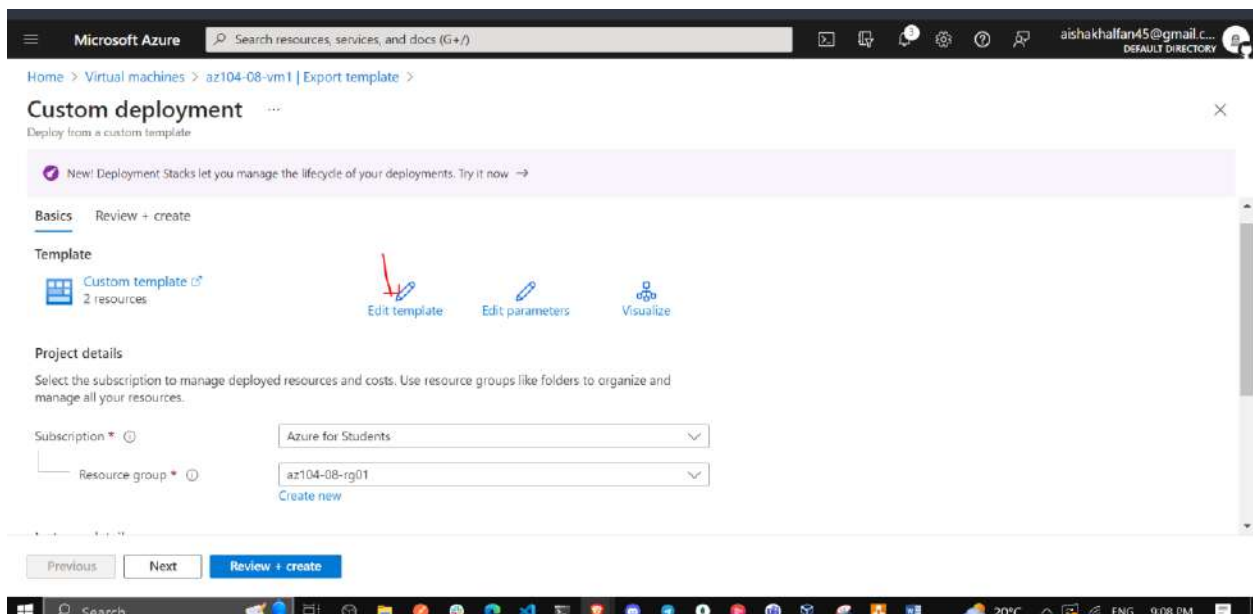


12. On the **az104-08-vm1 - Export template** blade, click **Deploy**.



13. On the **Custom deployment** blade, click **Edit template**.

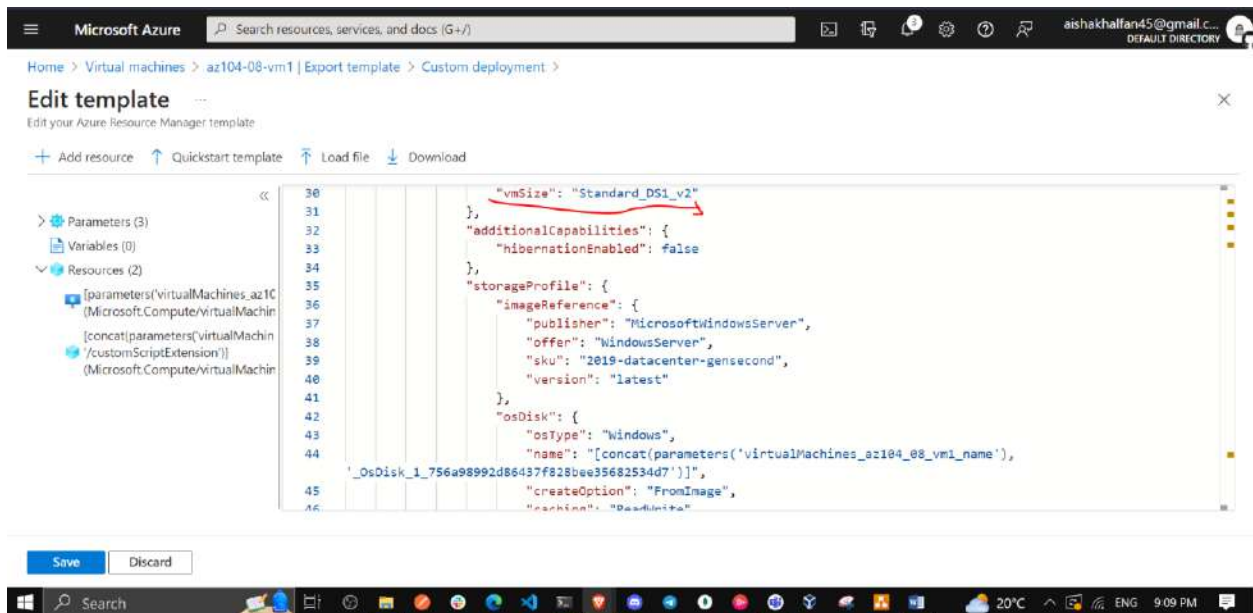
Note: Disregard the message stating **The resource group is in a location that is not supported by one or more resources in the template. Please choose a different resource group.** This is expected and can be ignored in this case.



14. On the **Edit template** blade, in the section displaying the content of the template, replace the line 30 `"vmSize": "Standard_D2s_v3"` with the following line):

`"vmSize": "Standard_DS1_v2"`

Note: This section of the template defines the same Azure virtual machine size as the one you specified for the first virtual machine via the Azure portal.



15. On the **Edit template** blade, in the section displaying the content of the template, replace line 51 (`"dataDisks": [],`) with the following code :

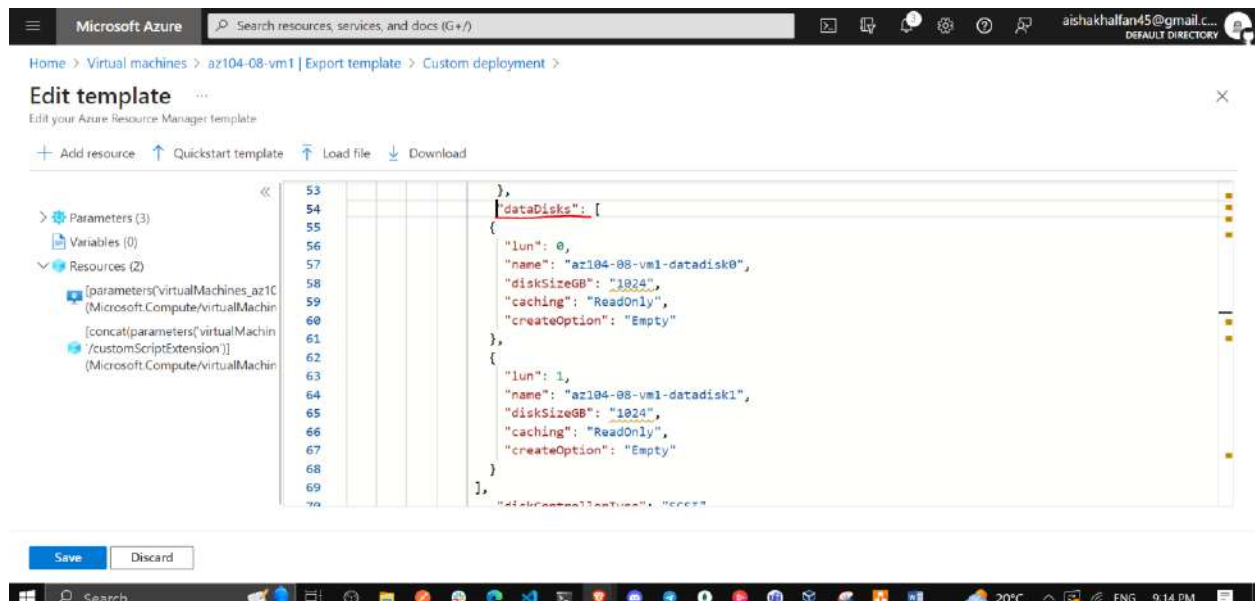
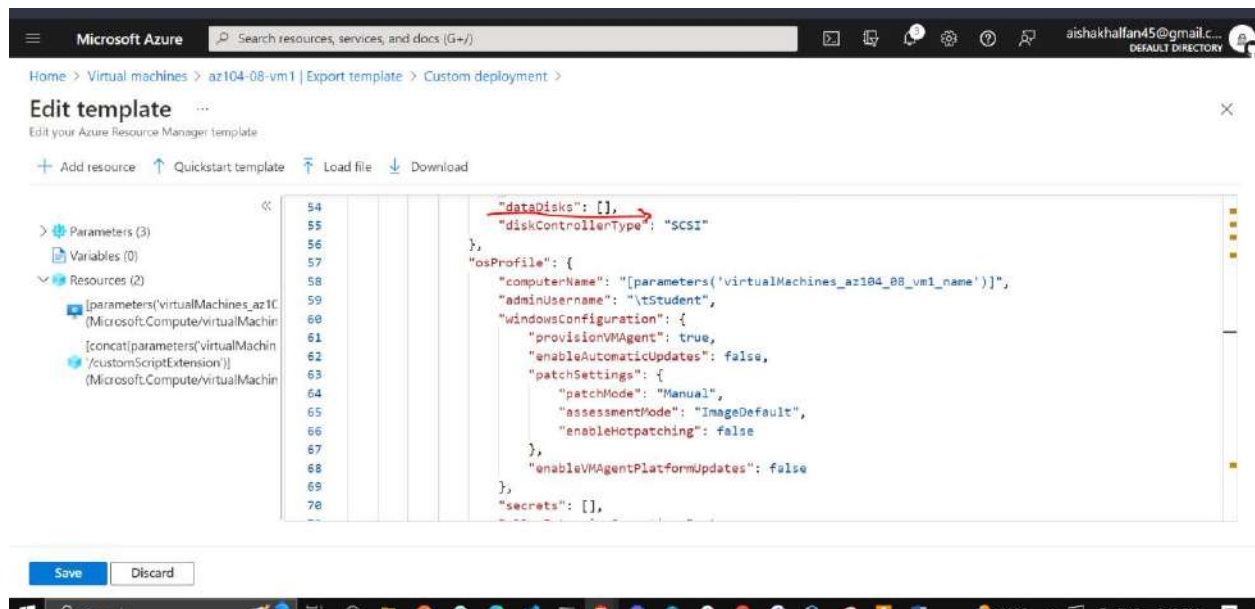
```

"dataDisks": [
  {
    "lun": 0,
    "name": "az104-08-vm1-datadisk0",
    "diskSizeGB": "1024",
    "caching": "ReadOnly",
    "createOption": "Empty"
  },
  {
    "lun": 1,
    "name": "az104-08-vm1-datadisk1",
    "diskSizeGB": "1024",
    "caching": "ReadOnly",
    "createOption": "Empty"
  }
],

```

Note: If you are using a tool that pastes the code in line by line intellisense may add extra brackets causing validation errors. You may want to paste the code into notepad first and then paste it into line 49.

Note: 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.



- Click **Save** and, back on the **Custom deployment** blade, click **Review + Create** and, on the **Review + Create** blade, click **Create**.

Note: Wait for the template deployment to complete. You can monitor its progress from the **Disks** blade of the **az104-08-vm1** virtual machine. This should take no more than 3 minutes.

Microsoft Azure

Search resources, services, and docs (G+)

Home > Virtual machines > az104-08-vm1 | Export template >

Custom deployment

Deploy from a custom template

New! Deployment Stacks let you manage the lifecycle of your deployments. Try it now →

Template

Customized template
2 resources

Edit template

Edit parameters

Visualize

Project details

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

Subscription

Azure for Students

Resource group

az104-08-rg01

Create new

Instance details

Previous

Next

Review + create

https://portal.azure.com/#

Search

20°C

ENG

9:16 PM

Microsoft Azure

Search resources, services, and docs (G+)

Home > Virtual machines > az104-08-vm1 | Export template >

Custom deployment

Deploy from a custom template

Basics

Review + create

Summary

Customized template
2 resources

Terms

[Azure Marketplace Terms](#)

[Azure Marketplace](#)

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Previous

Next

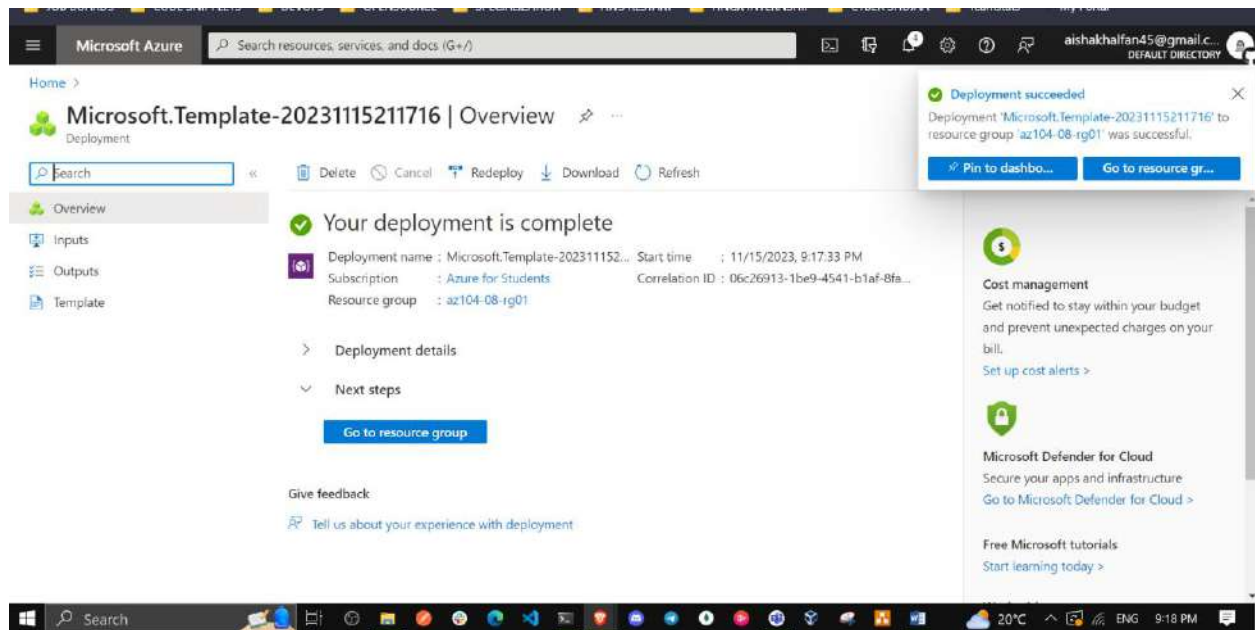
Create

Search

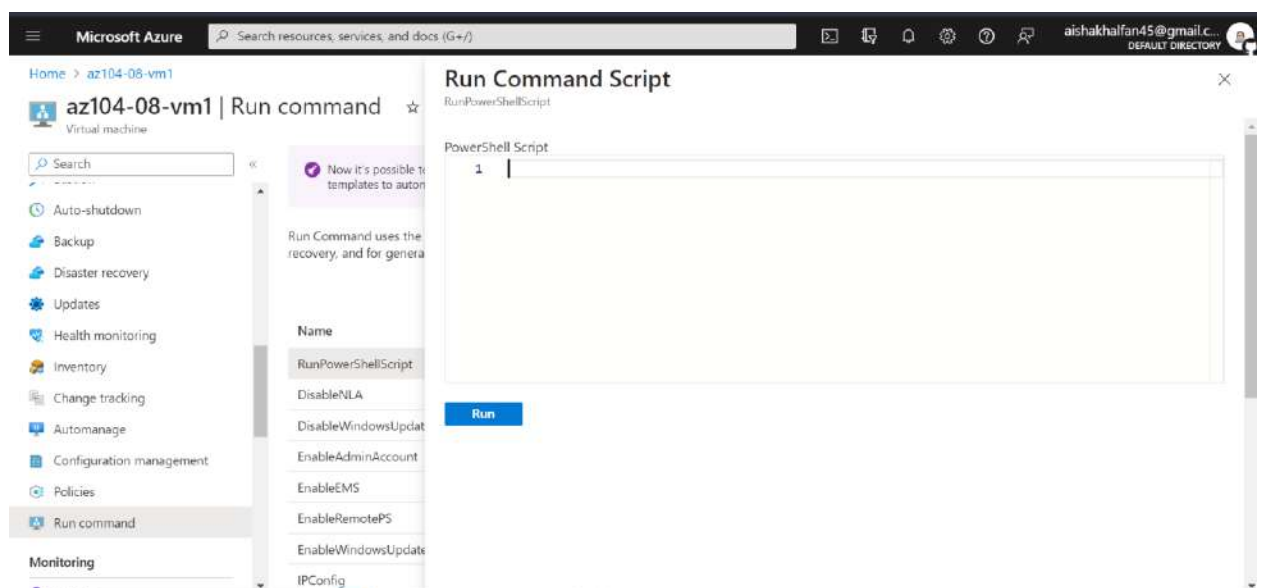
20°C

ENG

9:16 PM



17. Back on the **az104-08-vm1** blade, in the **Operations** section, click **Run command**, and, in the list of commands, click **RunPowerShellScript**.



18. On the **Run Command Script** blade, type the following and click **Run** to create a drive Z: consisting of the two newly attached disks with the simple layout and fixed provisioning:

```
New-StoragePool -FriendlyName storagepool1 -StorageSubsystemFriendlyName "Windows Storage*" -PhysicalDisks (Get-PhysicalDisk -CanPool $true)
```

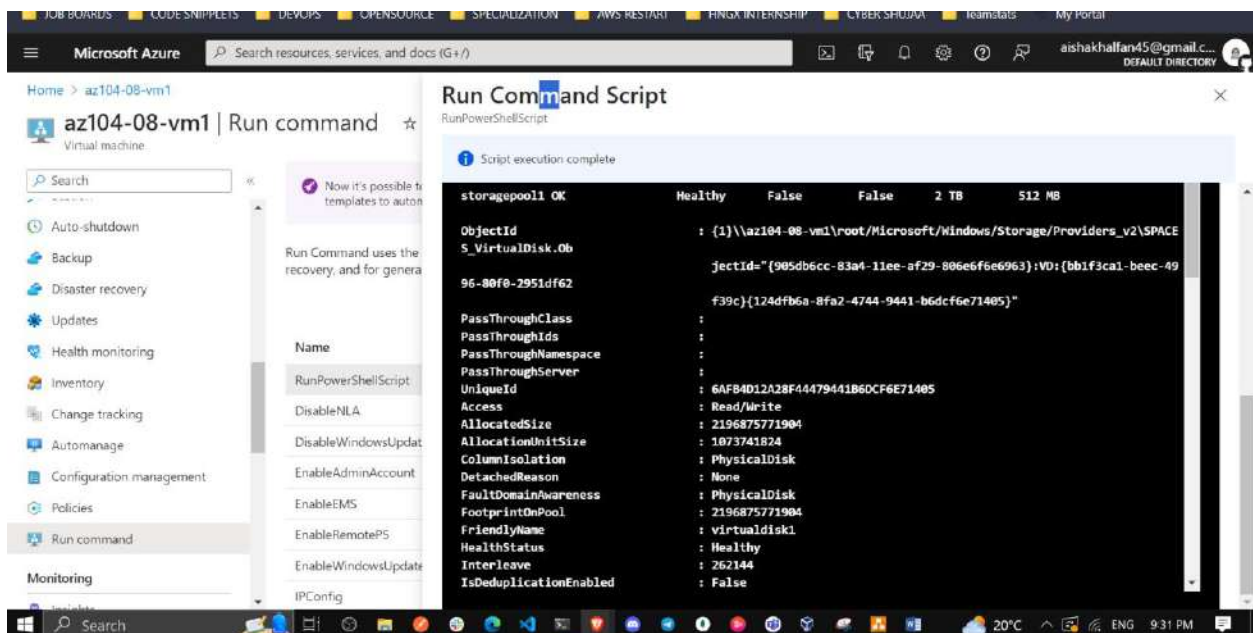
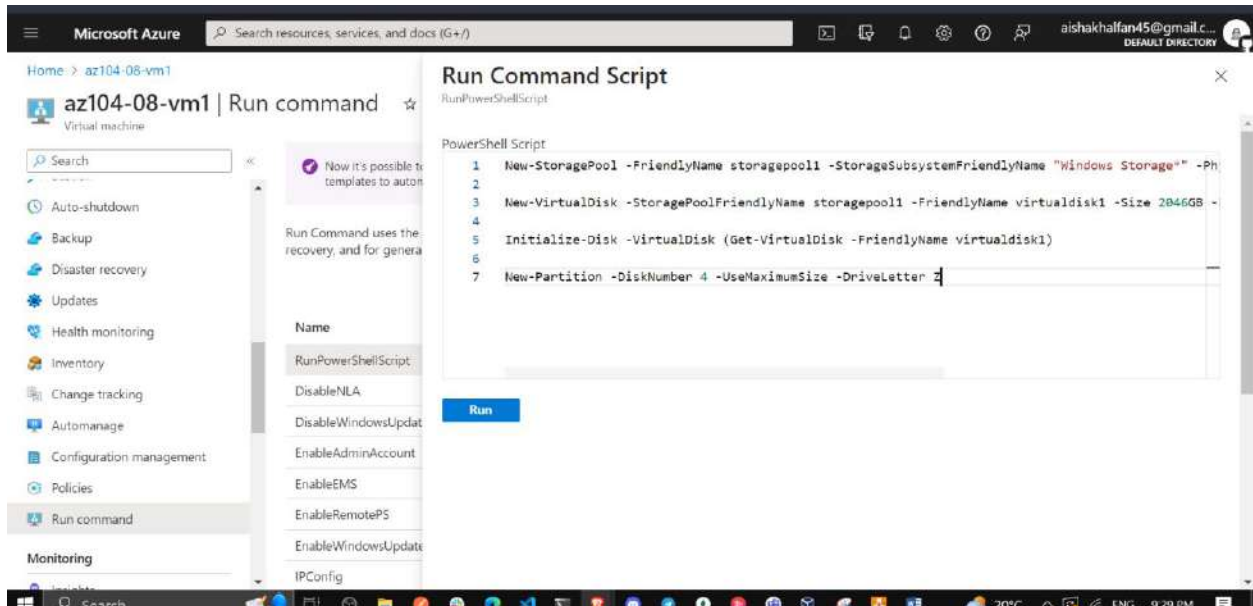
```
New-VirtualDisk -StoragePoolFriendlyName storagepool1 -FriendlyName
```

```
me virtualdisk1 -Size 2046GB -ResiliencySettingName Simple -Provi  
sioningType Fixed
```

```
Initialize-Disk -VirtualDisk (Get-VirtualDisk -FriendlyName virtu  
aldisk1)
```

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

Note: Wait for the confirmation that the commands completed successfully.



Microsoft Azure | Search resources, services, and docs (G+)

Home > az104-08-vm1

az104-08-vm1 | Run command

Virtual machine

Search

Now it's possible to templates to auton

Run Command uses the recovery, and for genera

Name

RunPowerShellScript

DisableNLA

DisableWindowsUpdat

EnableAdminAccount

EnableEMS

EnableRemotePS

EnableWindowsUpdate

IPConfig

Run Command Script

RunPowerShellScript

Script execution complete

```
IsEnclosureAware : False
IsManualAttach    : False
IsSnapshot        : False
IsTiered          : False
LogicalSectorSize : 512
MediaType         : Unspecified
Name              :
NameFormat        :
NumberOfAvailableCopies : 2
NumberOfColumns   : 1
NumberOfDataCopies : 1
NumberOfGroups    : 1
OperationalStatus : OK
OtherOperationalStatusDescription :
OtherUsageDescription :
ParityLayout      :
PhysicalDiskRedundancy : 0
PhysicalSectorSize : 4096
ProvisioningType   : Fixed
ReadCacheSize     : 0
RequestNoSinglePointOfFailure : False
ResiliencySettingName : Simple
Size              : 2196875771904
```

Microsoft Azure | Search resources, services, and docs (G+)

Home > az104-08-vm1

az104-08-vm1 | Run command

Virtual machine

Search

Now it's possible to templates to auton

Run Command uses the recovery, and for genera

Name

RunPowerShellScript

DisableNLA

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EnableEMS

EnableRemotePS

EnableWindowsUpdate

IPConfig

Run Command Script

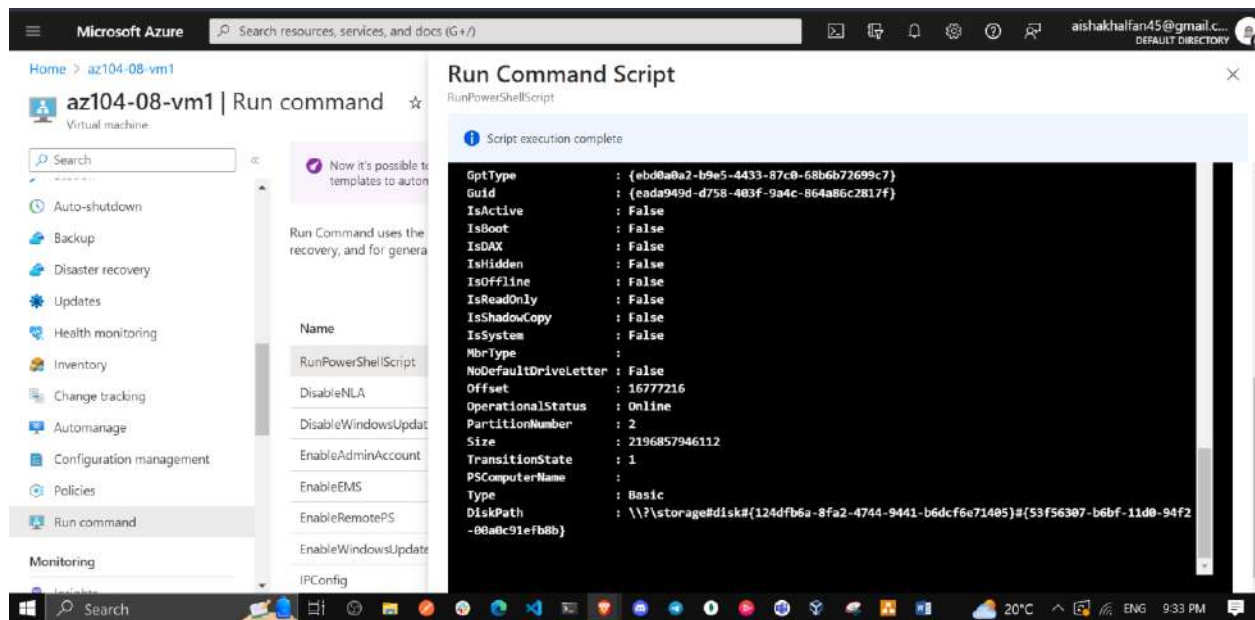
RunPowerShellScript

Script execution complete

```
UniqueIdFormat : Vendor Specific
UniqueIdFormatDescription :
Usage          : Data
WriteCacheSize : 0
PSComputerName :

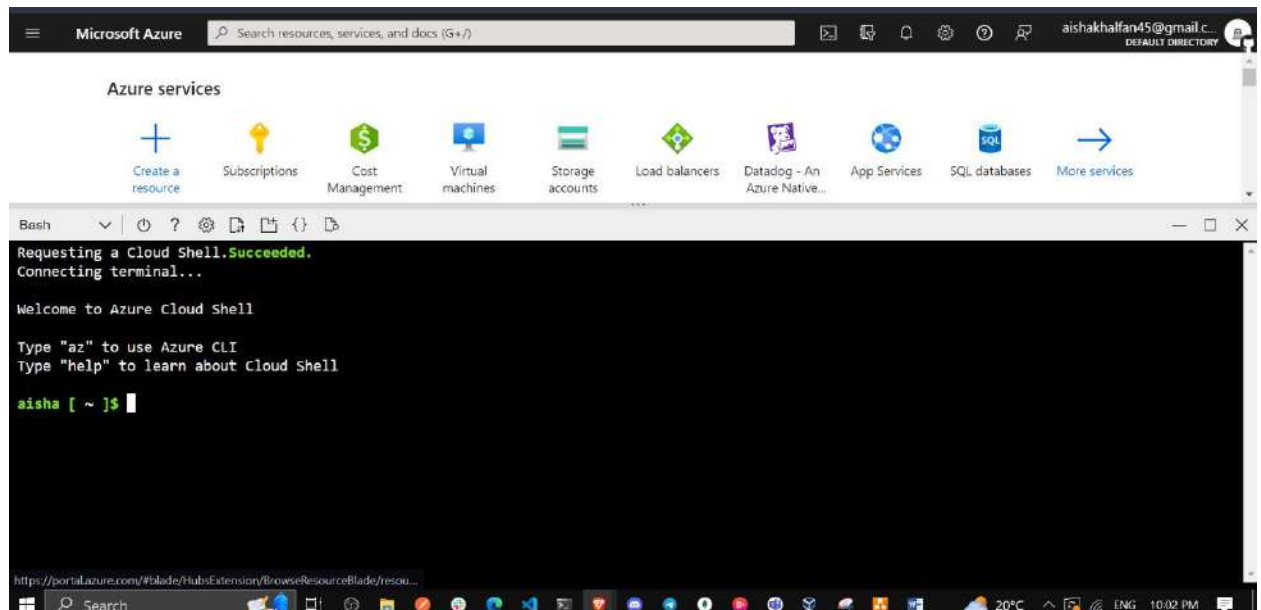
ObjectId       : {1}\az104-08-vm1\root\Microsoft\Windows\Storage\Providers_v2\WSP_Partition.ObjectId="905db6cc-83a4-11ee-af29-806e6f6e6963":PR:(00000000-0000-0000-0000-000100000000)\?\storage#(124dfb6a-8fa2-4744-9441-b6dcf6e71405)#(53f56307-b6bf-11d0-94f2-00a0c91efb8b)"
e8disk#(124dfb6a-8fa2-4744-9441-b6dcf6e71405)#(53f56307-b6bf-11d0-94f2-00a0c91efb8b)"

PassThroughClass :
PassThroughIds   :
PassThroughNamespace :
PassThroughServer :
UniqueId        : {00000000-0000-0000-0000-000100000000}6AFB4D12A28F44479441B6DCFE71405
AccessPaths      : {Z:\, \\?\Volume{eada949d-d758-403f-9a4c-864a86c2817f}\}
DiskId          : \\?\storage#disk#(124dfb6a-8fa2-4744-9441-b6dcf6e71405)#(53f56307-b6bf-11d0-94f2-00a0c91efb8b)
DiskNumber      : 4
DriveLetter     : Z
GptType         : {ebd000a2-b9e5-4433-87c0-68b6b72699c7}
```

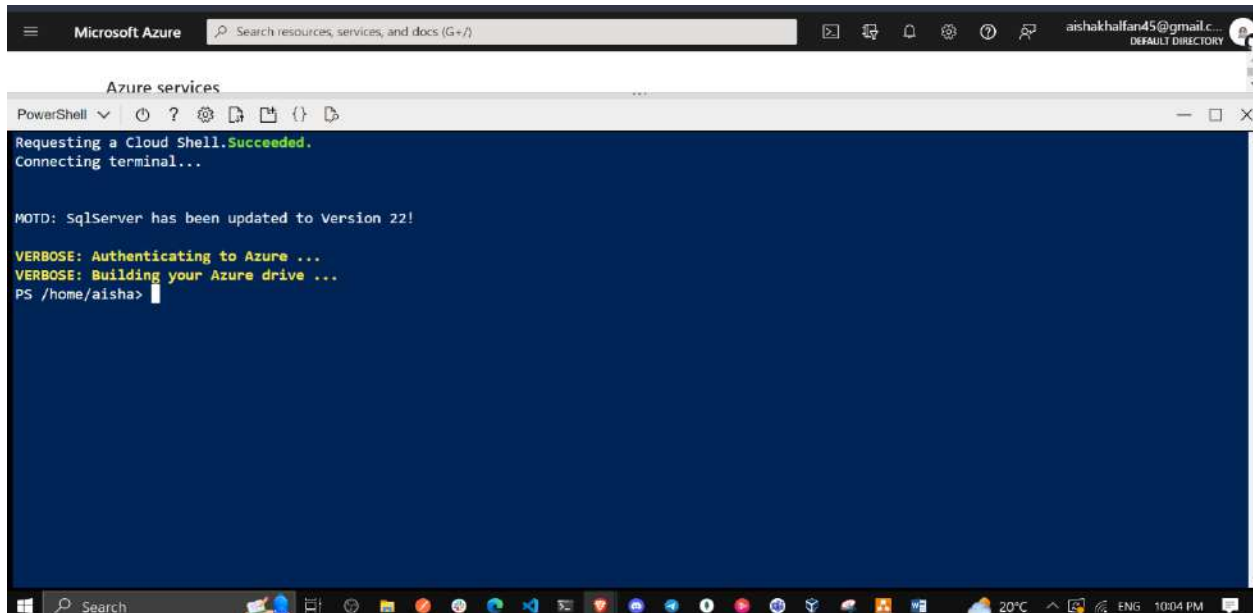
Task 4: Register the Microsoft.Insights and Microsoft.AlertsManagement resource providers

1. In the Azure portal, open the **Azure Cloud Shell** by clicking on the icon in the top right of the Azure Portal.



2. If prompted to select either **Bash** or **PowerShell**, select **PowerShell**.

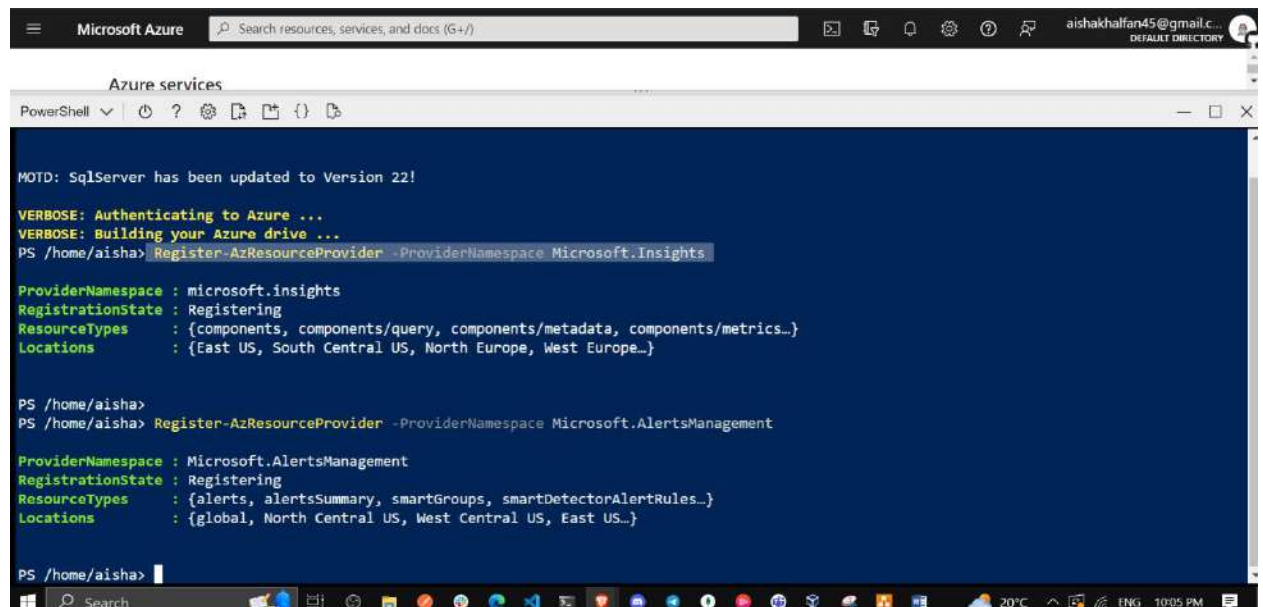
Note: If this is the first time you are starting **Cloud Shell** and you are presented with the **You have no storage mounted** message, select the subscription you are using in this lab, and click **Create storage**.



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

`Register-AzResourceProvider -ProviderNamespace Microsoft.Insights`

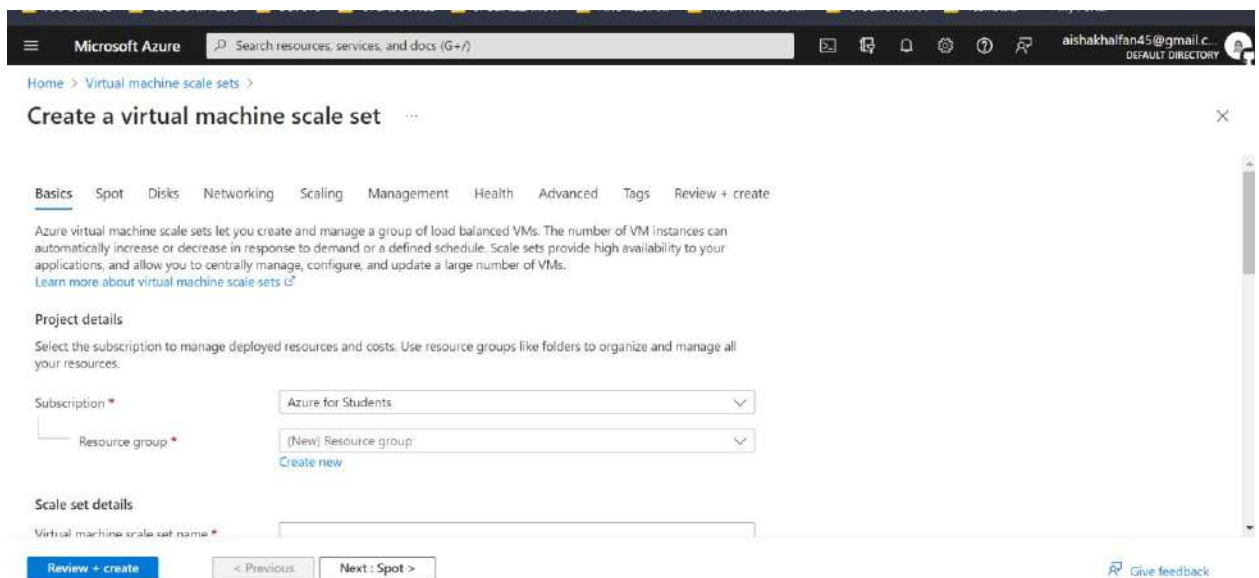
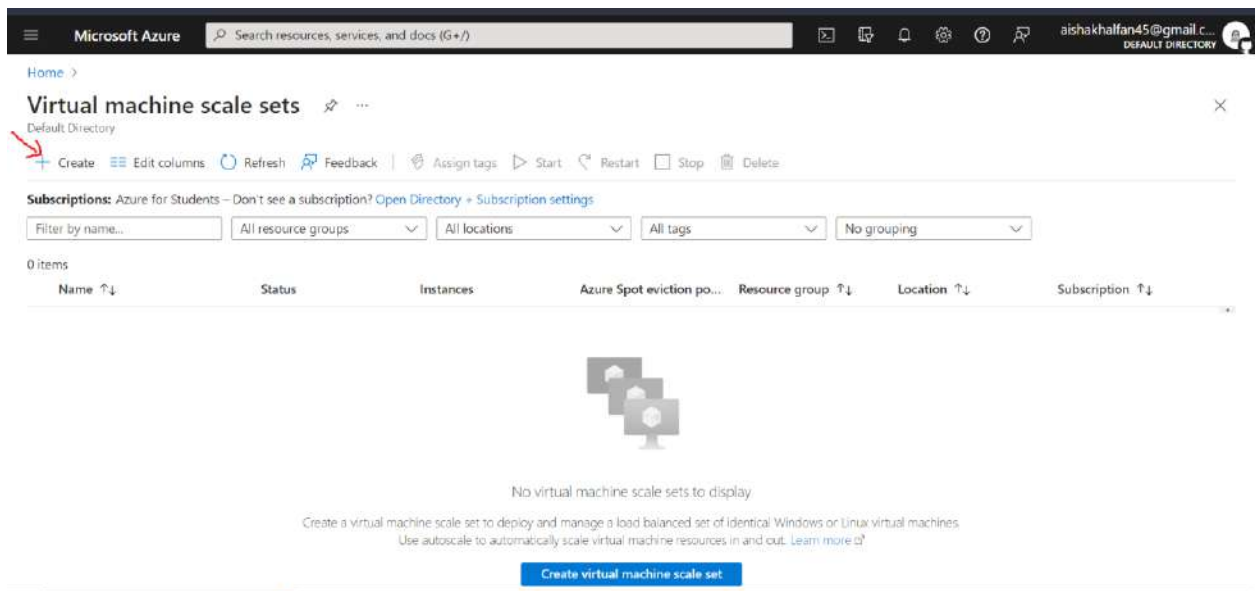
`Register-AzResourceProvider -ProviderNamespace Microsoft.AlertsManagement`



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

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

1. In the Azure portal, search for and select **Virtual machine scale sets** and, on the **Virtual machine scale sets** blade, click **+ Add** (or **+ Create**).



2. On the **Basics** tab of the **Create a virtual machine scale set** blade, specify the following settings (leave others with their default values) and click **Next : Disks >**:

Setting	Value
Subscription	the name of the Azure subscription you are using in this lab
Resource group	the name of a new resource group az104-08-rg02
Virtual machine scale set name	az10408vmss0
Region	select one of the regions that support availability zones and where you can provision Azure virtual machines different from the one you used to deploy virtual machines earlier in this lab
Availability zone	Zones 1, 2, 3
Orchestration mode	Uniform
Image	Windows Server 2019 Datacenter - Gen2
Run with Azure Spot discount	No
Size	Standard D2s_v3
Username	Student
Password	Provide a secure password
Already have a Windows Server license?	Unchecked

Note: For the list of Azure regions which support deployment of Windows virtual machines to availability zones, refer to [What are Availability Zones in Azure?](#)

Microsoft Azure | Search resources, services, and docs (G+)

Home > Virtual machine scale sets >

Create a virtual machine scale set

Select the subscription to manage deployed resources and costs, use resource groups to organize and manage all your resources.

Subscription *

Resource group * [Create new](#)

Scale set details

Virtual machine scale set name *

Region *

Availability zone ⓘ

- ☒ Zone 1
- ☒ Zone 2
- ☒ Zone 3

Orchestration

[Give feedback](#)

Microsoft Azure Search resources, services, and docs (G+)

Home > Virtual machine scale sets >

Create a virtual machine scale set

Orchestration

A scale set has a "scale set model" that defines the attributes of virtual machine instances (size, number of data disks, etc). As the number of instances in the scale set changes, new instances are added based on the scale set model.
[Learn more about the scale set model](#)

Orchestration mode *

☐ Flexible: achieve high availability at scale with identical or multiple virtual machine types

☒ Uniform: optimized for large scale stateless workloads with identical instances

Security type

Trusted launch virtual machines
[Configure security features](#)

Instance details

Image *

Windows Server 2019 Datacenter - x64 Gen2
[See all images](#) | [Configure VM generation](#)

VM architecture

☐ Arm64

☒ x64

[Review + create](#) < Previous Next: Spot > [Give feedback](#)

Microsoft Azure Search resources, services, and docs (G+)

Home > Virtual machine scale sets >

Create a virtual machine scale set

Run with Azure Spot discount

☐

Size *

Standard_D2s_v3 - 2 vcpus, 8 GiB memory (\$137.24/month)
[See all sizes](#)

Enable Hibernation (preview)

☐

To enable Hibernation, you must register your subscription. [Learn more](#)

Administrator account

Username *

Student ✓

Password *

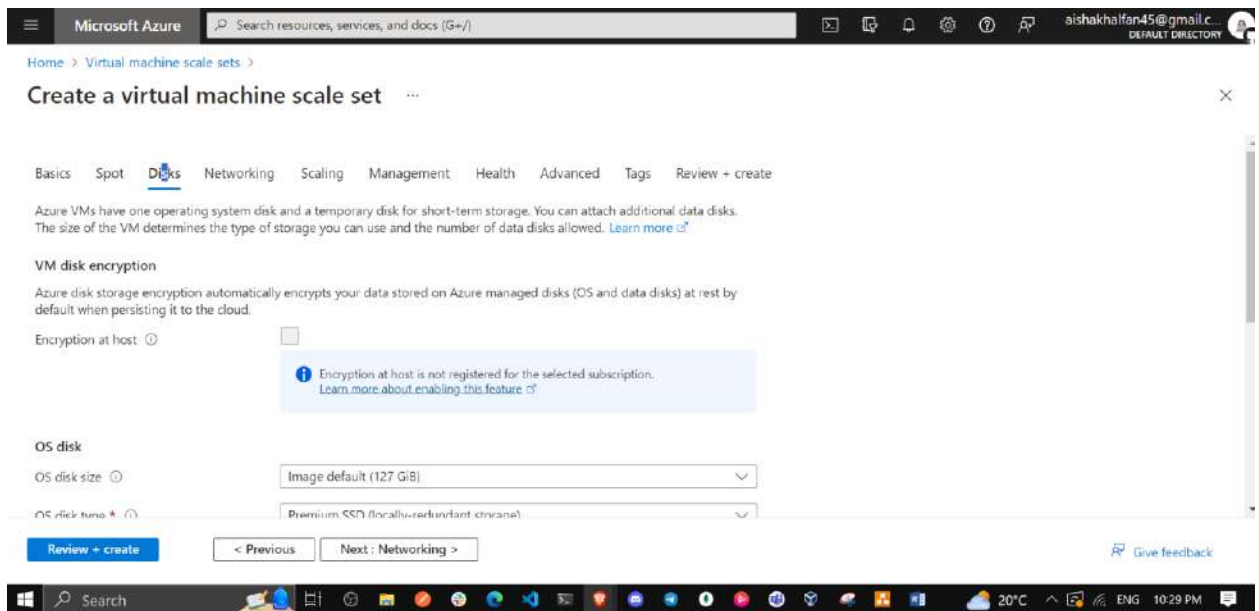
***** ✓

Confirm password *

***** ✓

[Review + create](#) < Previous Next: Spot > [Give feedback](#)

- On the **Disks** tab of the **Create a virtual machine scale set** blade, accept the default values and click **Next : Networking** >.



4. On the **Networking** tab of the **Create a virtual machine scale set** blade, click the **Create virtual network** link below the **Virtual network** textbox and create a new virtual network with the following settings (leave others with their default values).

Setting	Value
Name	az104-08-rg02-vnet
Address range	10.82.0.0/20
Subnet name	subnet0
Subnet range	10.82.0.0/24

Note: Once you create a new virtual network and return to the **Networking** tab of the **Create a virtual machine scale set** blade, the **Virtual network** value will be automatically set to **az104-08-rg02-vnet**.

Microsoft Azure

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

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10:30 PM

aishakhalfan45@gmail.c...
DEFAULT DIRECTORY

Home > Virtual machine scale sets >

Create a virtual machine scale set

BasicsSpotDisksNetworkingScalingManagementHealthAdvancedTagsReview + 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 about VMSS networking](#)

Virtual network configuration

Azure Virtual Network (VNet) enables many types of Azure resources to securely communicate with each other, the internet, and on-premises networks. [Learn more about VNets](#)

Virtual network (New) az104-08-rg02-vnet (recommended)
[Create virtual network](#)

Network interface

A network interface enables an Azure virtual machine to communicate with internet, Azure, and on-premises resources. A VM can have one or more network interfaces.

Review + createPreviousNext: Scaling >

Microsoft Azure

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

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10:30 PM

aishakhalfan45@gmail.c...
DEFAULT DIRECTORY

Home > Virtual machine scale sets >

Create a virtual machine scale set

BasicsSpotDisksNetworkingScalingManagement

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 about VMSS networking](#)

Virtual network configuration

Azure Virtual Network (VNet) enables many types of Azure resources to securely communicate with each other, the internet, and on-premises networks. [Learn more about VNets](#)

Virtual network (New) az104-08-rg02-vnet
[Create virtual network](#)

Network interface

A network interface enables an Azure virtual machine to communicate with internet, Azure, and on-premises resources. A VM can have one or more network interfaces.

Review + createPreviousNext: Scaling >

Create virtual network

Virtual Network service enables Azure resources to securely communicate with each other in a virtual network which is a logical isolation of the Azure cloud dedicated to your subscription. You can connect virtual networks to other virtual networks, or your on-premises network.
[Learn more about virtual networks](#)

Name *az104-08-rg02-vnet

Resource group *(New) az104-08-rg02
[Create new](#)

Address space

The virtual network's address space specified as one or more address prefixes in CIDR notation (e.g. 10.0.0.0/16).

<input type="checkbox"/> Address range	Addresses	Overlap
<input type="checkbox"/> 10.1.0.0/16	10.1.0.4 - 10.1.255.254 (65531 addresses)	None
<input checked="" type="checkbox"/> 10.82.0.0/20	10.82.0.4 - 10.82.15.254 (4091 addresses)	None
<input type="text"/>	(0 Addresses)	None

Subnets

OKDiscard

Create virtual network

Address space
The virtual network's address space specified as one or more address prefixes in CIDR notation (e.g. 10.0.0.0/16).

Address range	Addresses	Overlap
<input type="checkbox"/> 10.1.0.0/16	10.1.0.4 - 10.1.255.254 (65531 addresses)	None
<input checked="" type="checkbox"/> 10.82.0.0/20	10.82.0.4 - 10.82.15.254 (4091 addresses)	None
<input type="checkbox"/> (0 Addresses)		None

Subnets
The subnet's address range in CIDR notation (e.g. 10.0.0.0/24). It must be contained by the address space of the virtual network.

Subnet name	Address range	Addresses
<input type="checkbox"/> default	10.1.0.0/20	10.1.0.4 - 10.1.15.254 (4091 addresses)
<input checked="" type="checkbox"/> subnet0	10.82.0.0/24	10.82.0.4 - 10.82.0.254 (251 addresses)
<input type="checkbox"/> (0 Addresses)		

Virtual network * [Create virtual network](#)

Network interface
A network interface enables an Azure virtual machine to communicate with other resources in the cloud. It can have one or more network interfaces.

[Review + create](#) [< Previous](#) [Next: Scaling](#) [OK](#) [Discard](#)

- Back on the **Networking** tab of the **Create a virtual machine scale set** blade, click the **Edit network interface** icon to the right of the network interface entry.
- On the **Edit network interface** blade, in the **NIC network security group** section, click **Advanced** and click **Create new** under the **Configure network security group** drop-down list.

Edit network interface

Network interface
Name *

Virtual network

Subnet *

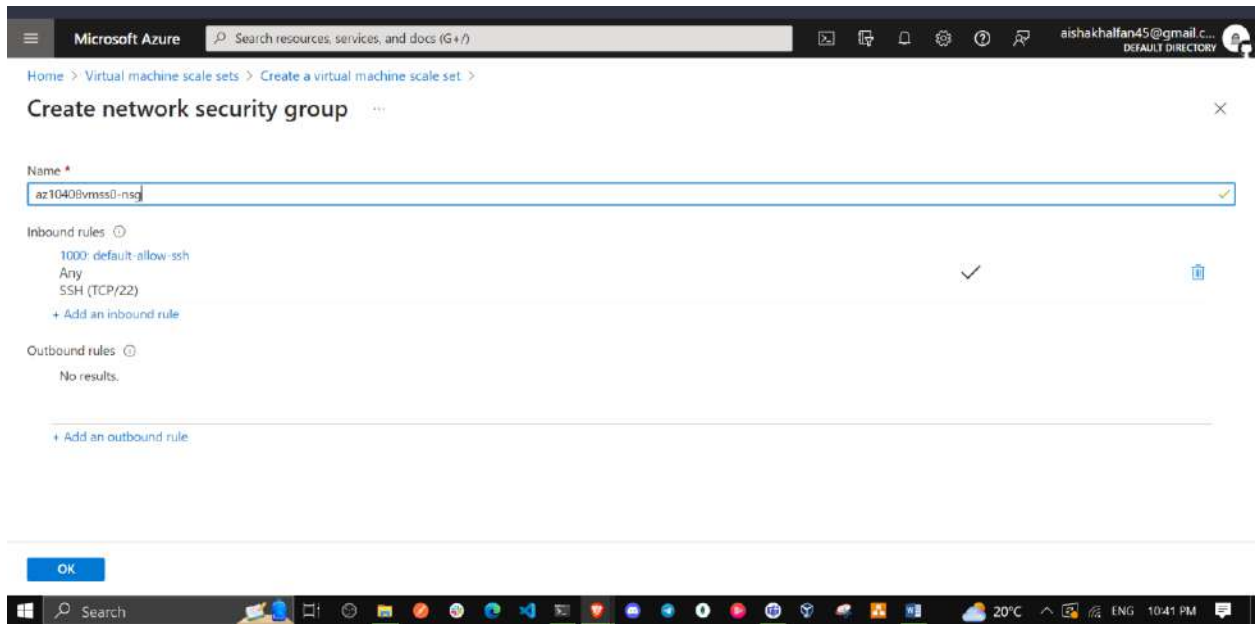
NIC network security group ☐ None ☐ Basic ☒ Advanced

Configure network security group *

[OK](#) [Cancel](#) [Give feedback](#)

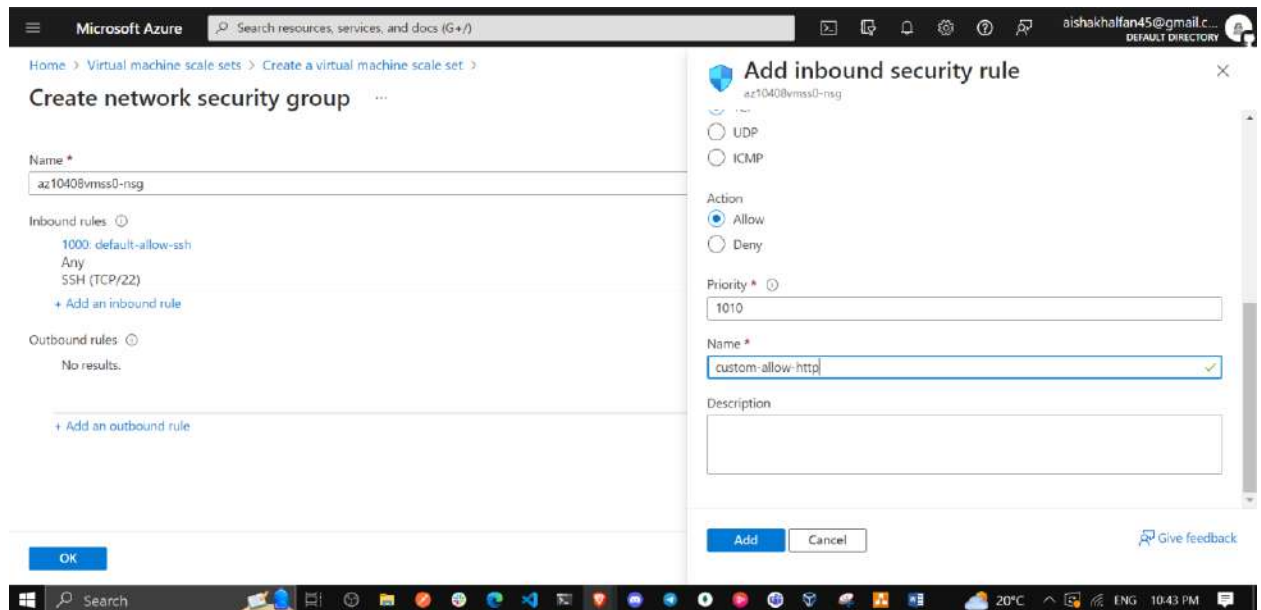
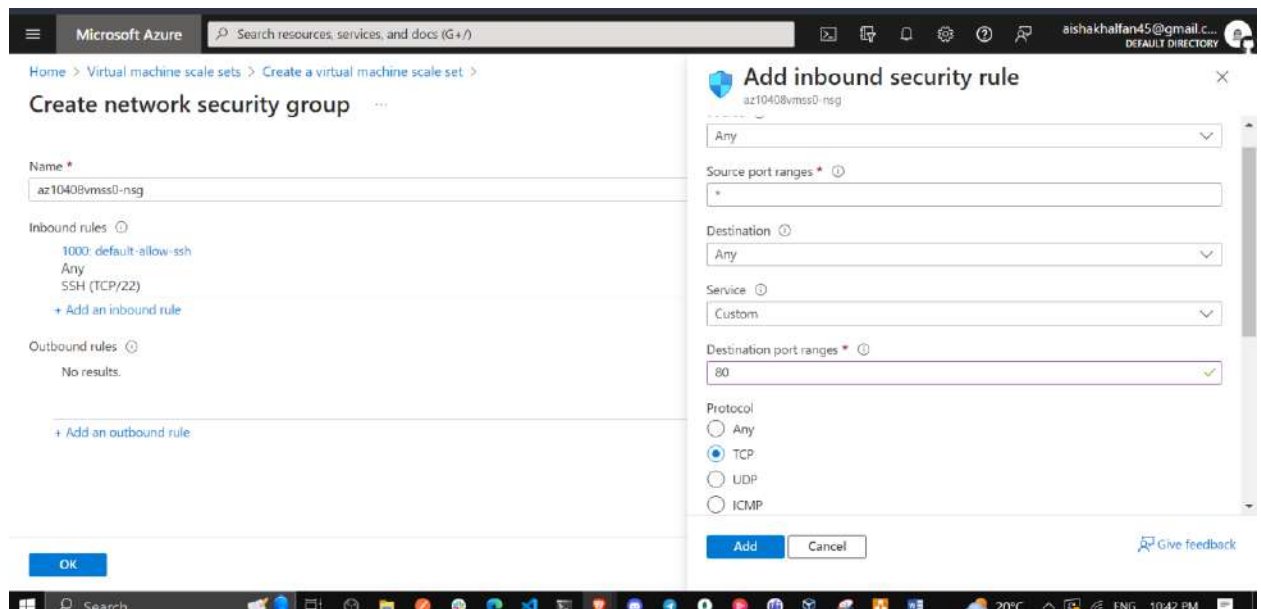
- On the **Create network security group** blade, specify the following settings (leave others with their default values):

Setting	Value
Name	az10408vmss0-nsg

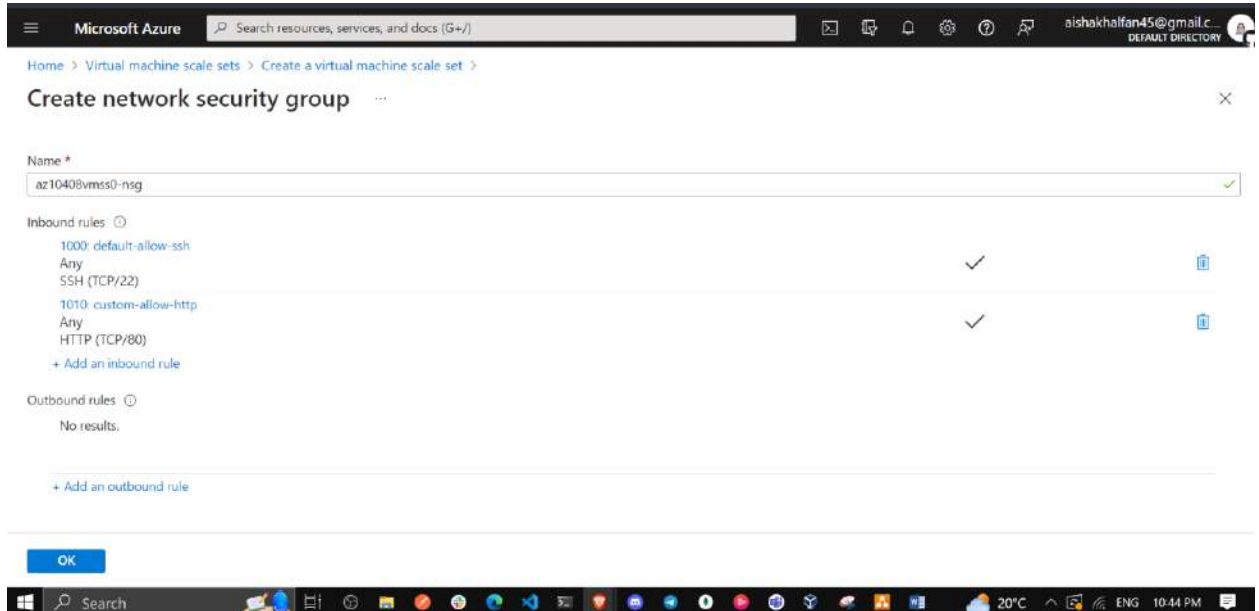
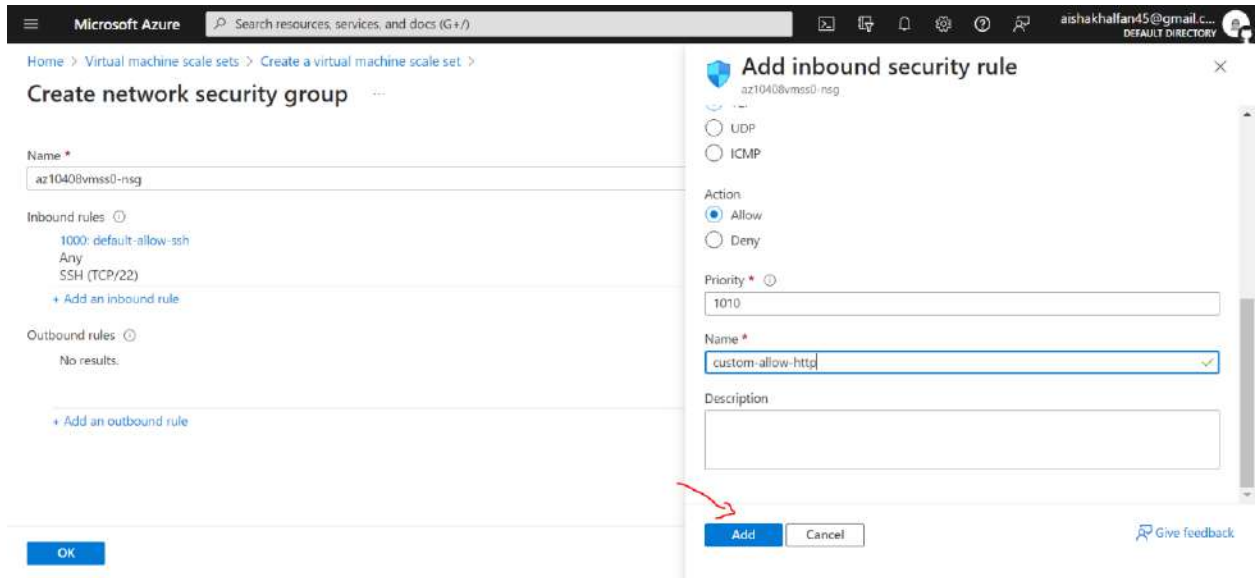


8. Click **Add an inbound rule** and add an inbound security rule with the following settings (leave others with their default values):

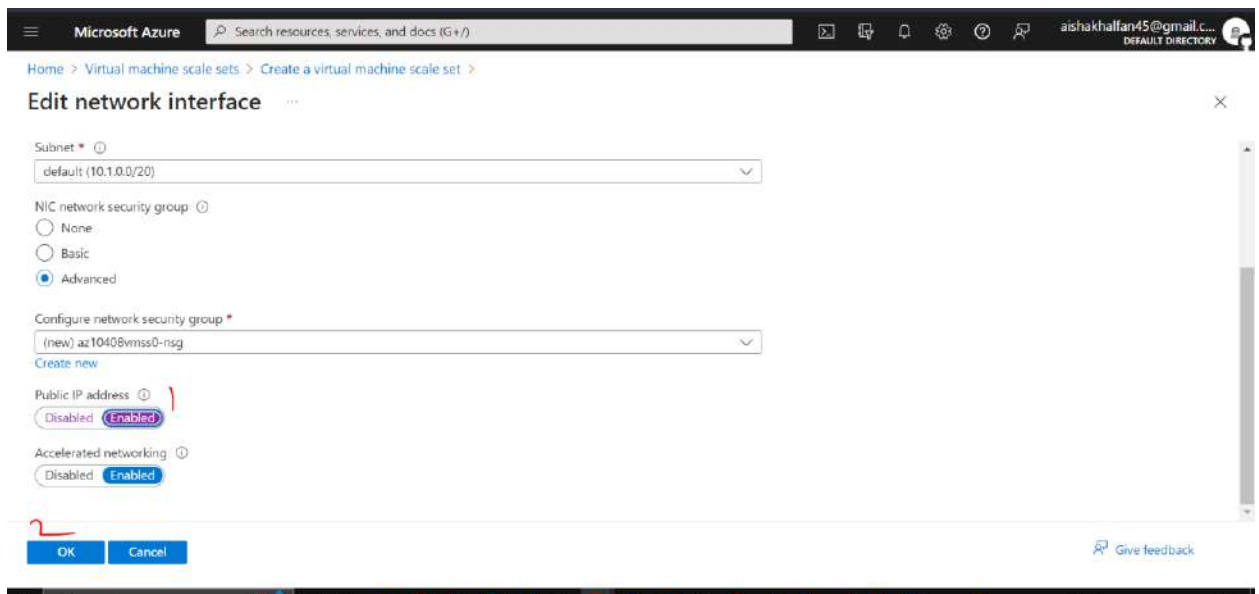
Setting	Value
Source	Any
Source port ranges	*
Destination	Any
Destination port ranges	80
Protocol	TCP
Action	Allow
Priority	1010
Name	custom-allow-http



9. Click **Add** and, back on the **Create network security group** blade, click **OK**.

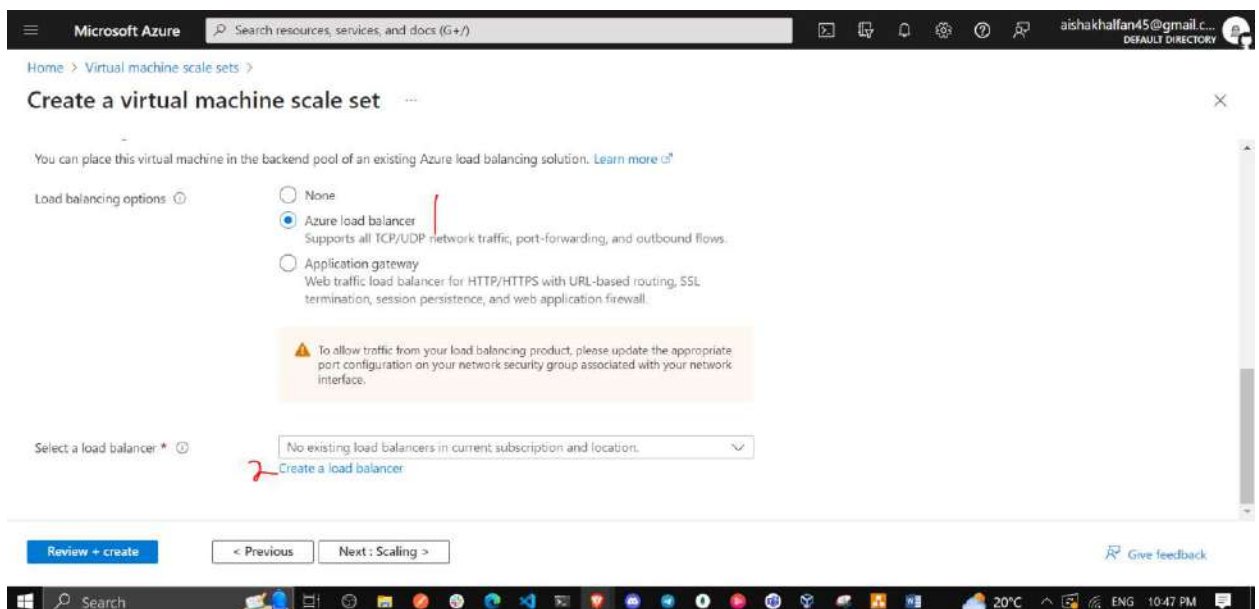


10. Back on the **Edit network interface** blade, in the **Public IP address** section, click **Enabled** and click **OK**.

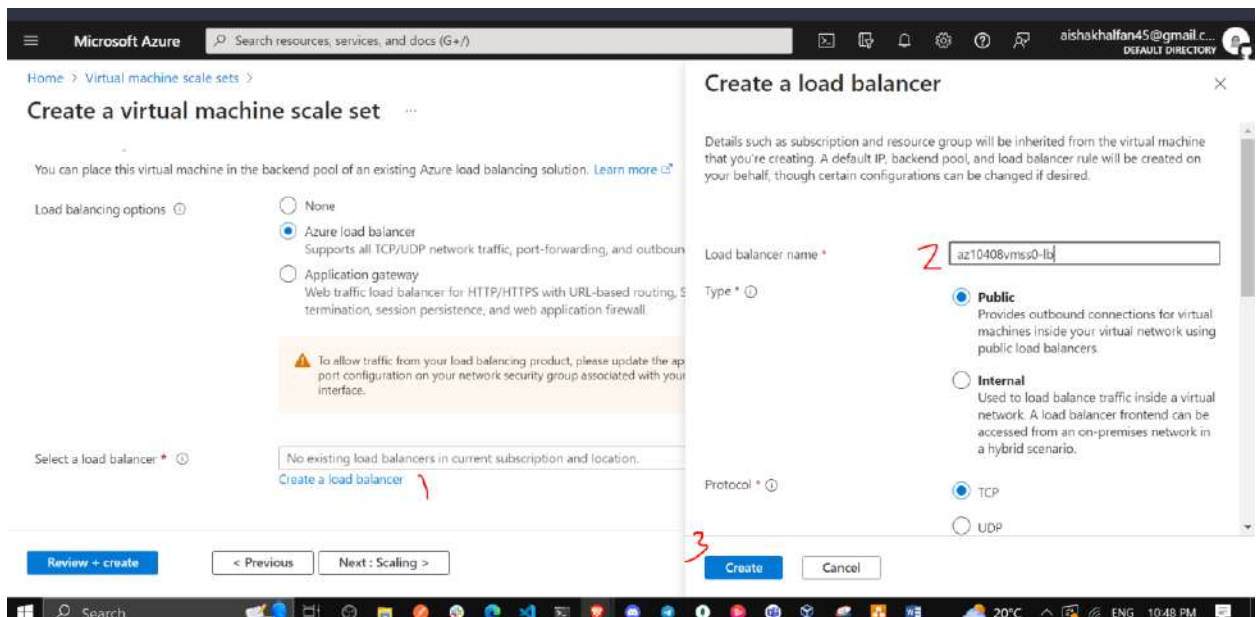


11. Back on the **Networking** tab of the **Create a virtual machine scale set** blade, under the **Load balancing** section, specify the following (leave others with their default values).

Setting	Value
Load balancing options	Azure load balancer
Select a load balancer	Create a load balancer



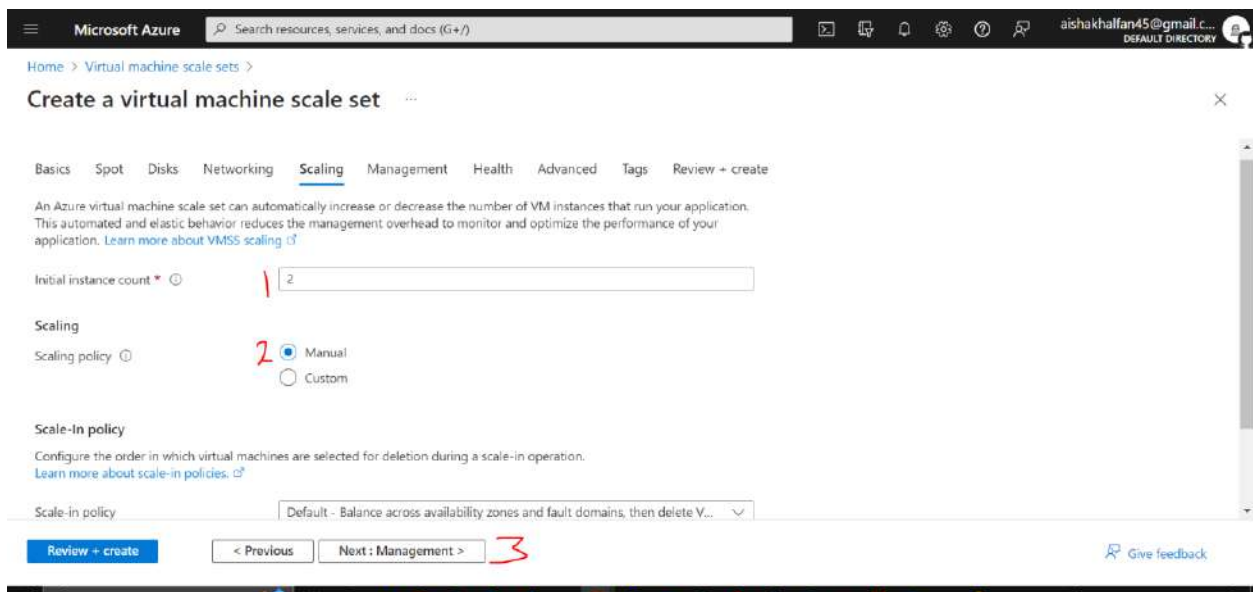
12. On the **Create a load balancer** page, specify the load balancer name and take the defaults. Click **Create** when you are done then **Next : Scaling >**.



Setting	Value
Load balancer name	az10408vmss0-lb

13. On the **Scaling** tab of the **Create a virtual machine scale set** blade, specify the following settings (leave others with their default values) and click **Next : Management >**:

Setting	Value
Initial instance count	2
Scaling policy	Manual



14. On the **Management** tab of the **Create a virtual machine scale set** blade, specify the following settings (leave others with their default values):

Setting	Value
Boot diagnostics	Enable with custom storage account
Diagnostics storage account	accept the default value

Note: You will need the name of this storage account in the next task.

Click **Next : Health >**:

The screenshot shows the 'Create a virtual machine scale set' blade in the Management tab. The 'Upgrade policy' section has 'Upgrade mode' set to 'Manual - Existing instances must be manually upgraded'. The 'Monitoring' section has 'Boot diagnostics' set to 'Enable with custom storage account'. The 'Diagnostics storage account' is set to '(new) az10408rg02diag243'. The 'Identity' section has 'Enable system assigned managed identity' unchecked. The 'Next : Health >' button is highlighted with a red arrow.

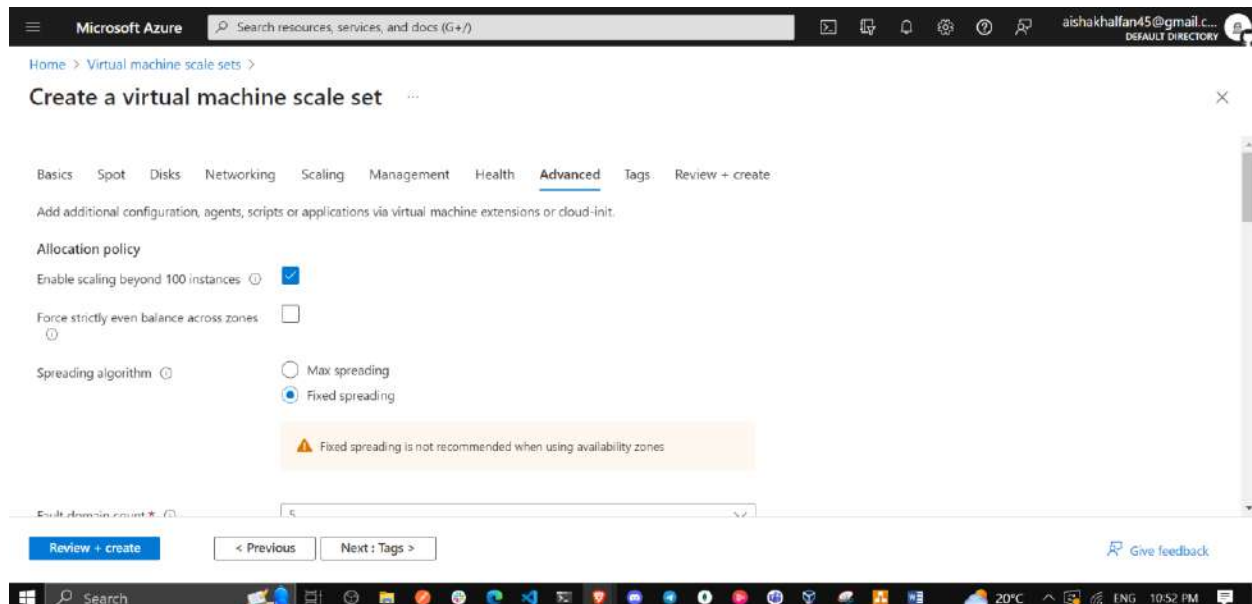
15. On the **Health** tab of the **Create a virtual machine scale set** blade, review the default settings without making any changes and click **Next : Advanced >**.

The screenshot shows the 'Create a virtual machine scale set' blade in the Health tab. The 'Health' section has 'Enable application health monitoring' unchecked. The 'Automatic repair policy' section has 'Enable automatic repairs' unchecked. The 'Next : Advanced >' button is highlighted with a red arrow.

16. On the **Advanced** tab of the **Create a virtual machine scale set** blade, specify the following settings (leave others with their default values) and click **Review + create**.

Setting	Value
Spreading algorithm	Fixed spreading (not recommended with zones)

Note: The **Max spreading** setting is currently not functional.



17. On the **Review + create** tab of the **Create a virtual machine scale set** blade, ensure that the validation passed and click **Create**.

Note: Wait for the virtual machine scale set deployment to complete. This should take about 5 minutes.



I got this validation error because my azure students account only allowed 3 Public IP addresses. To solve I had to disable the Public IP on the new NIC created

Microsoft Azure Search resources, services, and docs (G+/I)

Home > Virtual machine scale sets >

Create a virtual machine scale set

+ Create new nic Delete

NAME	CREATE PUBLIC...	SUBNET	NETWORK SECURI...	ACCELERATED BL...
az104-08-rg02-vnet-ni...	Yes	default (10.1.0.0/20)	Advanced	On

3 public IP addresses are needed for this configuration, but only 1 (of 3) remain in your subscription 'Azure for Students'. To meet your quota, you can disable the public IP address from the new NIC(s) or reduce the number of VMSS instances requested on the Scaling tab to get below the limit.

Load balancing
You can place this virtual machine in the backend pool of an existing Azure load balancing solution. [Learn more](#)

Load balancing options: ☐ None
☒ **Azure load balancer**
 Supports all TCP/UDP network traffic, port-forwarding, and outbound flows.
☐ Application gateway

[Review + create](#) < Previous Next > [Scaling](#) [Give feedback](#)

Microsoft Azure Search resources, services, and docs (G+/I)

Home > Virtual machine scale sets >

Create a virtual machine scale set

Validation passed

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

Basics

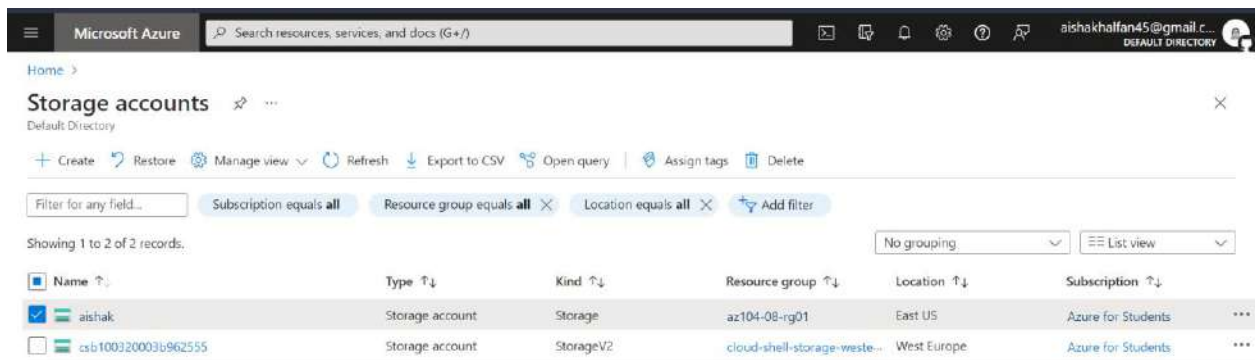
Subscription	Azure for Students
Resource group	(new) az104-08-rg02
Virtual machine scale set name	az10408vmss0
Region	East US
Orchestration mode	Uniform
Availability zone	1,2,3
Image	Windows Server 2019 Datacenter - Gen2
Size	Standard D2s v3 (2 vcpus, 8 GiB memory)
Security type	Trusted launch virtual machines

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

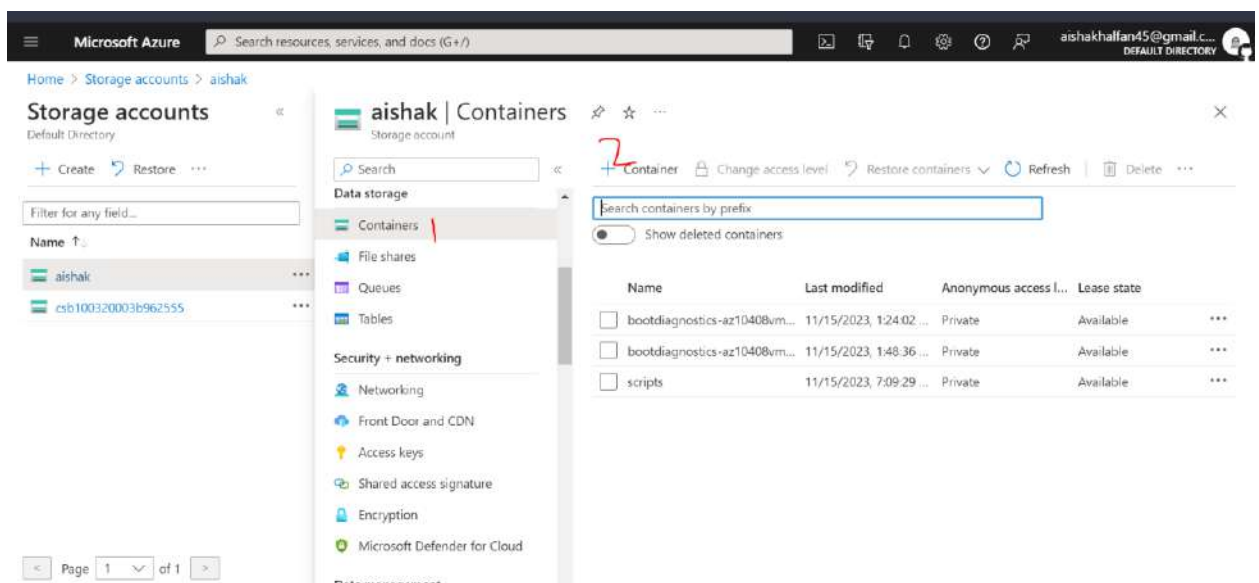
Task 6: Configure Azure virtual machine scale sets by using virtual machine extensions

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.

1. In the Azure portal, search for and select **Storage accounts** and, on the **Storage accounts** blade, click the entry representing the diagnostics storage account you created in the previous task.

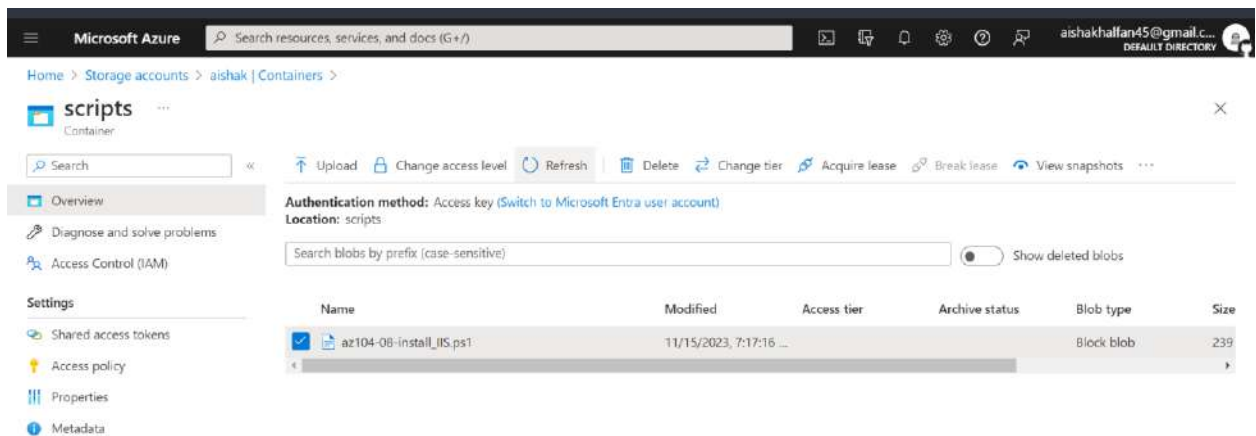


- On the storage account blade, in the **Data Storage** section, click **Containers** and then click **+ Container**.

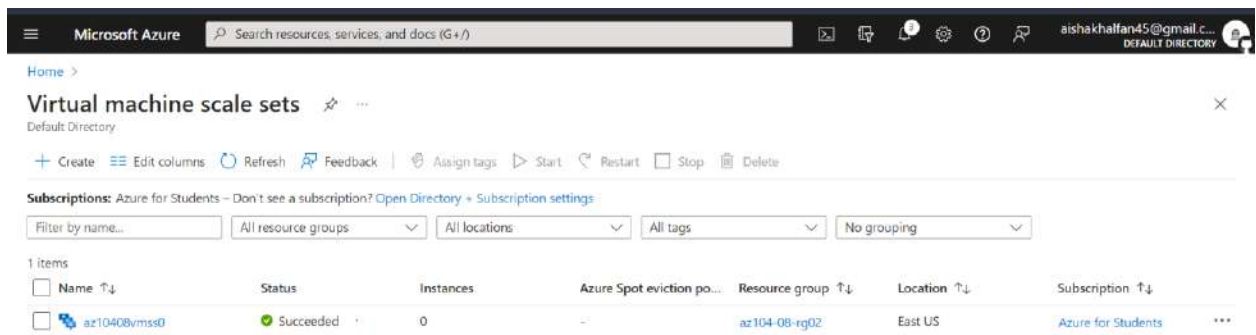


- On the **New container** blade, specify the following settings (leave others with their default values) and click **Create**:

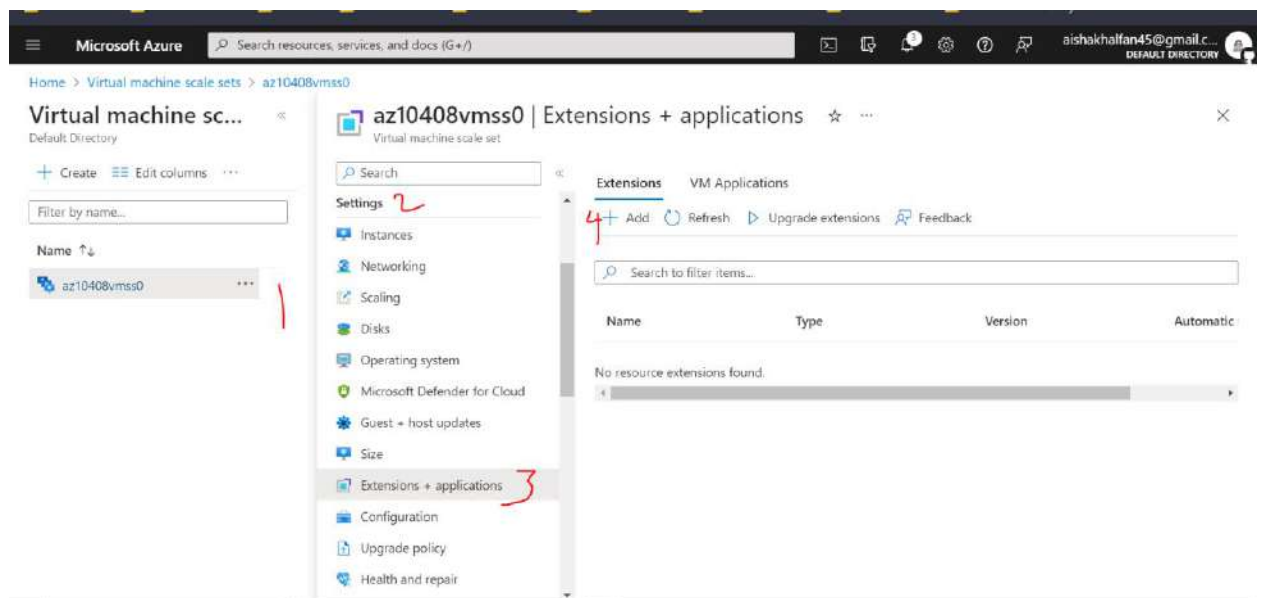
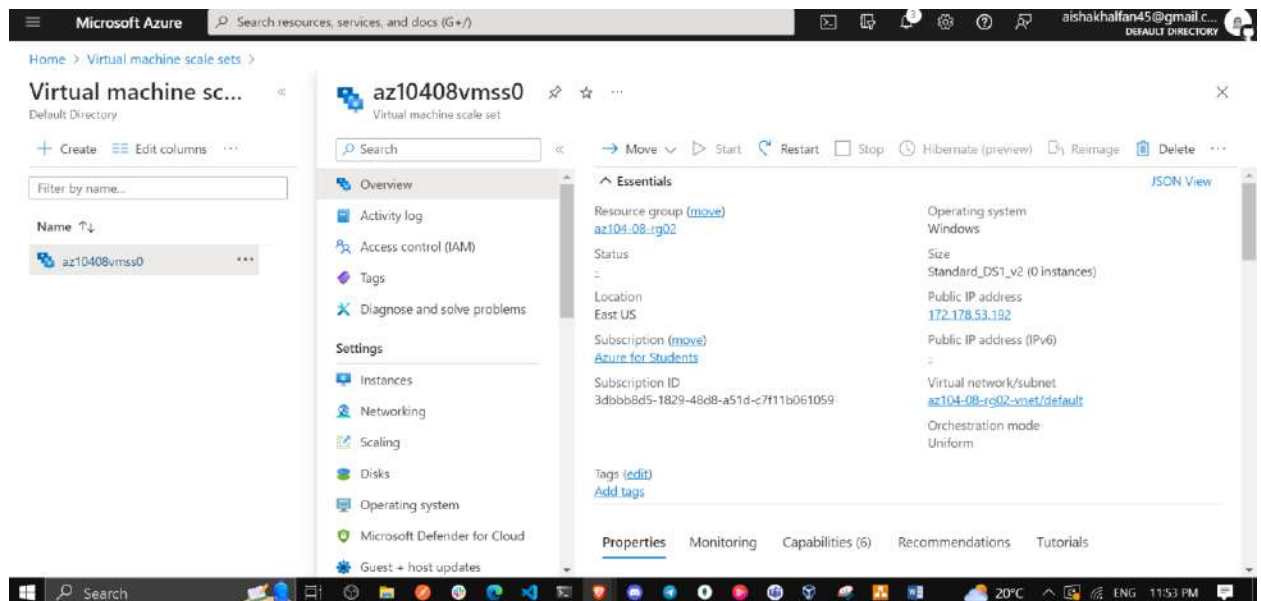
Setting	Value
Name	scripts
Public access level	Private (no anonymous access)



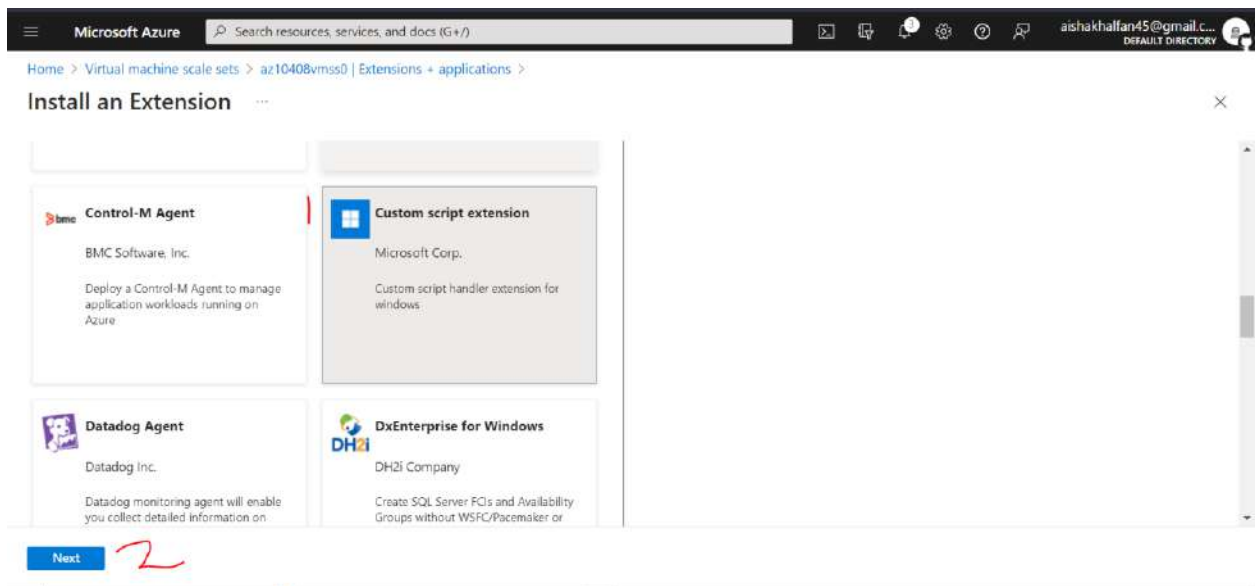
4. Back on the storage account blade displaying the list of containers, click **scripts**.
5. On the **scripts** blade, click **Upload**.
6. On the **Upload blob** blade, click the folder icon, in the **Open** dialog box, navigate to the **\Allfiles\Labs\08** folder, select **az104-08-install_IIS.ps1**, click **Open**, and back on the **Upload blob** blade, click **Upload**.
7. In the Azure portal, navigate back to the **Virtual machine scale sets** blade and click **az10408vmss0**.



8. On the **az10408vmss0** blade, in the **Settings** section, click **Extensions and applications**, and the click **+ Add**.

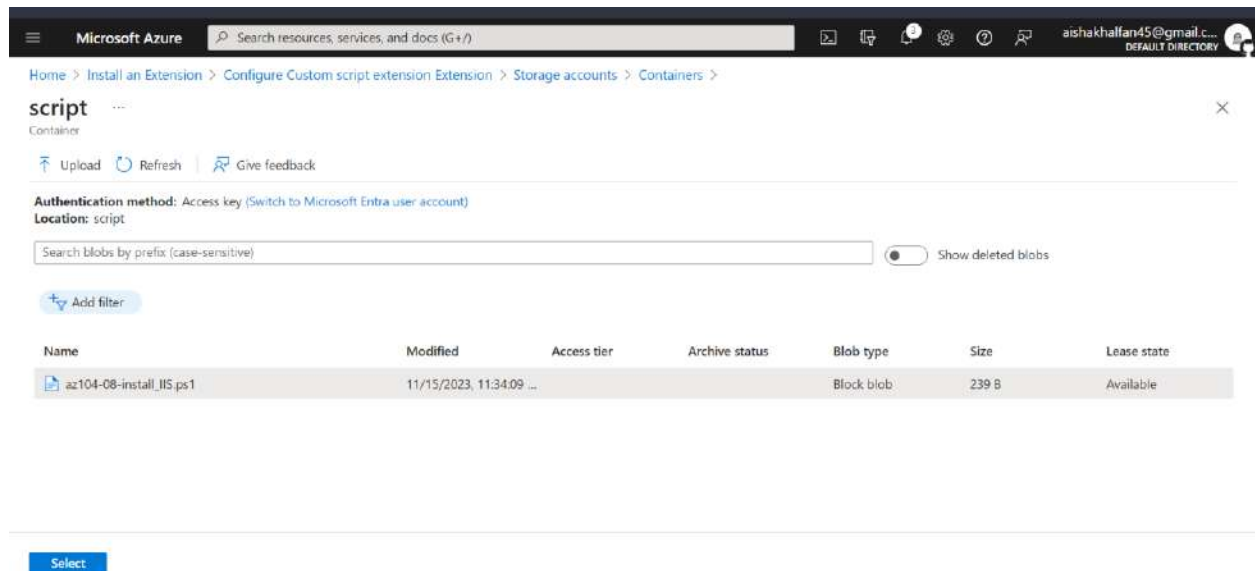


9. On the **New resource** blade, click **Custom Script Extension** and then click **Next**.



- 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**.

Note: Wait for the installation of the extension to complete before proceeding to the next step.



Microsoft Azure Search resources, services, and docs (G+)

Home > Install an Extension > Configure Custom script extension Extension

Configure Custom script extension Extension

Create

Script file (Required) *

Arguments (Optional)

- In the **Settings** section of the **az10408vmss0** blade, 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**.

Note: Wait for the upgrade to complete before proceeding to the next step.

Microsoft Azure Search resources, services, and docs (G+)

Home > az10408vmss0

az10408vmss0 | Instances

Virtual machine scale set

Search

Start Restart Stop Hibernate (preview) Reimage Delete Upgrade Refresh Protection Policy

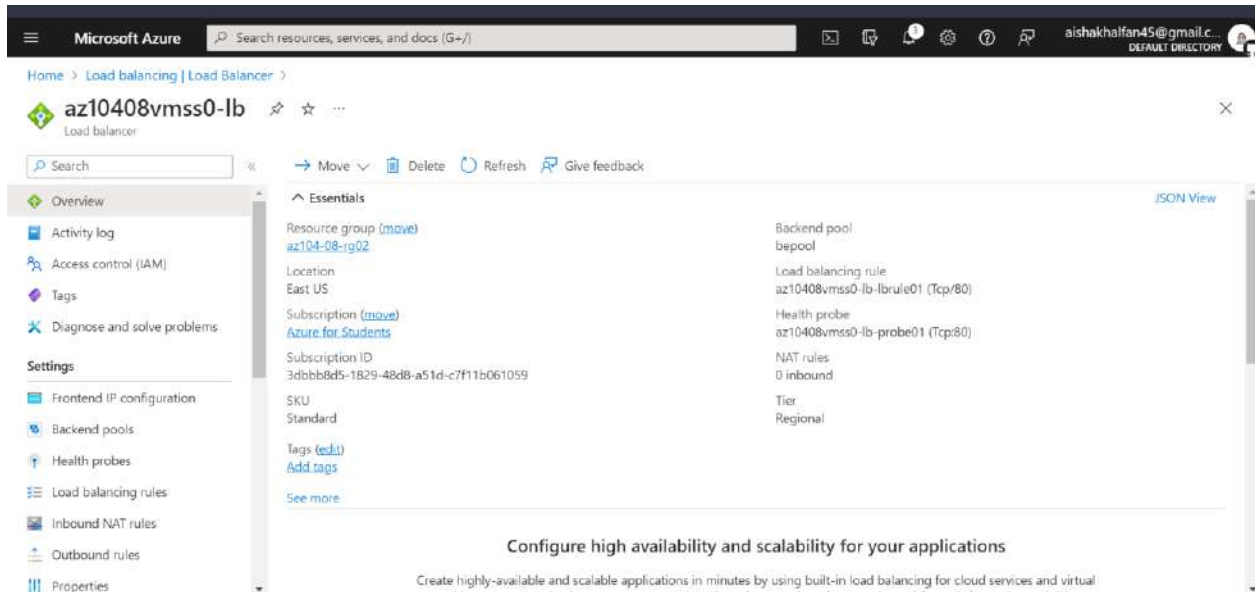
Settings

- Instances
- Networking
- Scaling
- Disks
- Operating system
- Microsoft Defender for Cloud
- Guest + host updates
- Size
- Extensions + applications
- Configuration
- Upgrade policy

Search virtual machine instances

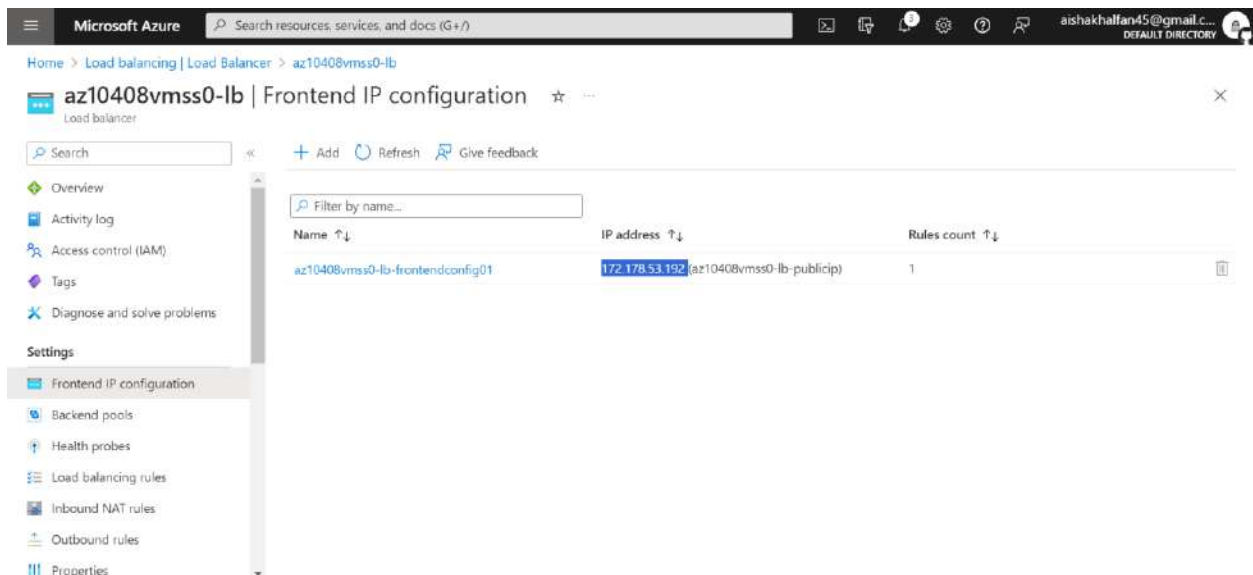
Instance	Computer name	Status	Protection policy	Provisioning sta...	Health state	Latest model
No results.						

- In the Azure portal, search for and select **Load balancers** and, in the list of load balancers, click **az10408vmss0-lb**.



- On the **az10408vmss0-lb** blade, 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.

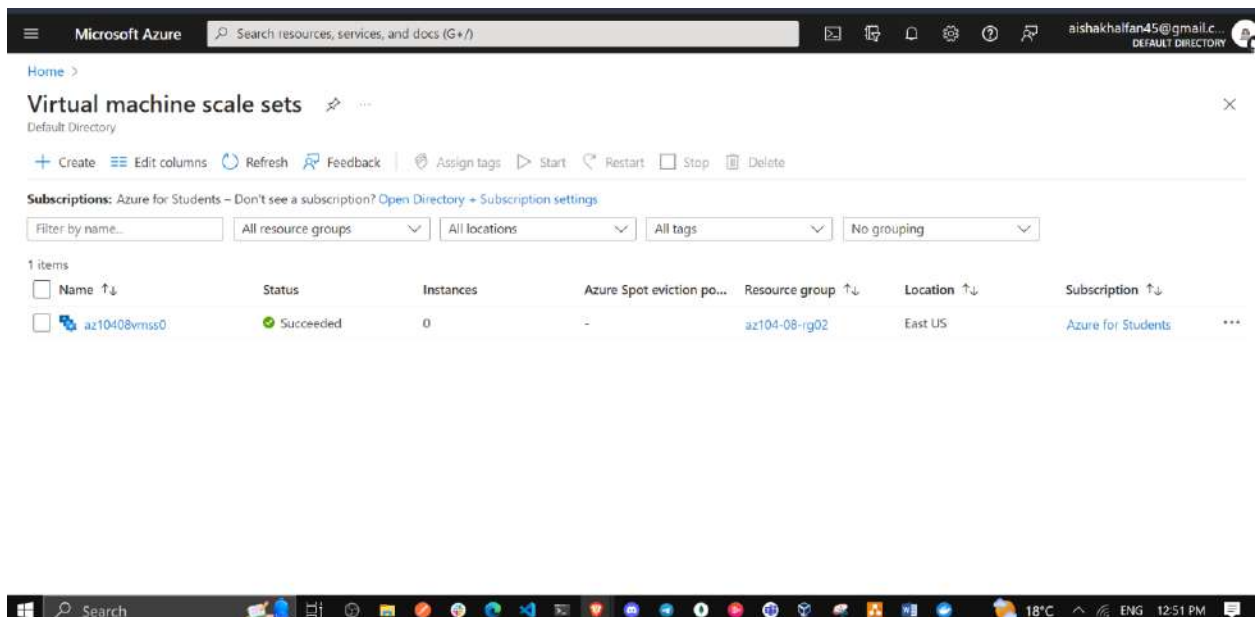
Note: Verify that the browser page displays the name of one of the instances of the Azure virtual machine scale set **az10408vmss0**.



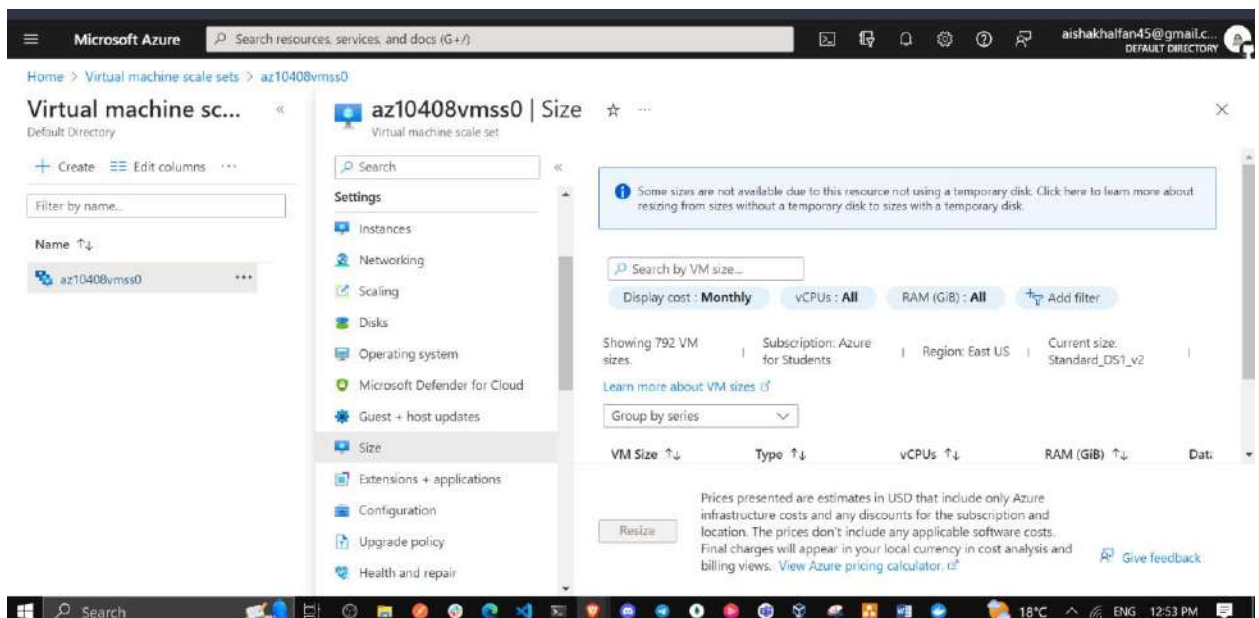
Task 7: Scale compute and storage for Azure virtual machine scale sets

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

- In the Azure portal, search for and select **Virtual machine scale sets** and select the **az10408vmss0** scale set



2. In the **az10408vmss0** blade, in the **Settings** section, click **Size**.



3. In the list of available sizes, select **Standard DS1_v2** and click **Resize**.

Microsoft Azure | Search resources, services, and docs (G+)

Home > Virtual machine scale sets > az10408vmss0

Virtual machine scale set

Default Directory

+ Create Edit columns

Filter by name...

Name ↑

az10408vmss0

Settings

- Instances
- Networking
- Scaling
- Disks
- Operating system
- Microsoft Defender for Cloud
- Guest + host updates
- Size**
- Extensions + applications
- Configuration
- Upgrade policy
- Health and repair

Search by VM size...

Display cost: Monthly vCPUs: All RAM (GiB): All Add filter

Showing 792 VM sizes. Subscription: Azure for Students Region: East US Current size: Standard_DS1_v2

Learn more about VM sizes

Group by series

VM Size	Type	vCPUs	RAM (GiB)	Data
D-Series v2				The 2nd generation D family sizes for you
DS1_v2	General purpose	1	3.5	4

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.](#)

Give feedback

Microsoft Azure | Search resources, services, and docs (G+)

Home > Virtual machine scale sets > az10408vmss0

Virtual machine scale set

Default Directory

+ Create Edit columns

Filter by name...

Name ↑

az10408vmss0

Settings

- Instances
- Networking
- Scaling**
- Disks
- Operating system
- Microsoft Defender for Cloud
- Guest + host updates
- Size
- Extensions + applications
- Configuration
- Upgrade policy
- Health and repair
- Identity

Save Discard Refresh Logs Feedback

There was an error updating instance count for resource 'az10408vmss0'. Detail message: {
 "error": {
 "details": [],
 "code": "PublicIPCountLimitExceededByVMScaleSet",
 "message": "The requested number of publicIPAddresses 2 for VM Scale Set /subscriptions/3dbbb8d5-1829-48d8-a51d-c7f11b061059/resourceGroups/AZ104-08-RG02/providers/Microsoft.Compute/virtualMachineScaleSets/az10408vmss0 will exceed the maximum number of publicIPAddresses allowed 3 for subscription 3dbbb8d5-1829-48d8-a51d-c7f11b061059."
 }
 }. Please try again in a few moments.

Configure Scale-In Policy Predictive charts Run history JSON Notify

Autoscale is a built-in feature that helps applications perform their best when demand changes. You can choose to scale your resource manually to a specific instance count, or via a custom Autoscale policy that scales based on metrics) thresholds, or schedule instance count which scales during designated time windows. Autoscale enables your resource to be performant and cost effective by adding and removing instances based on demand. [Learn more about Azure Autoscale](#) or [view the how-to video](#).

Choose how to scale your resource

Manual scale Custom autoscale

- In the **Settings** section, 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**.
- In the list of instances, click the entry representing the first instance and, on the scale set instance blade, note its **Location** (it should be one of the zones in the target Azure region into which you deployed the Azure virtual machine scale set).
- Return to the **az10408vmss0 - Instances** blade, click the entry representing the second instance and, on the scale set instance blade, note its **Location** (it should be one of the other two zones in the target Azure region into which you deployed the Azure virtual machine scale set).
- Return to the **az10408vmss0 - Instances** blade, and in the **Settings** section, click **Scaling**.

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

Setting	Value
Scale mode	Scale based on a metric

9. Click the **+ Add a rule** link and, on the **Scale rule** blade, specify the following settings (leave others with their default values):

Setting	Value
Metric source	Current resource (az10480vmss0)
Time aggregation	Average
Metric namespace	Virtual Machine Host
Metric name	Network In Total
Operator	Greater than
Metric threshold to trigger scale action	10
Duration (in minutes)	1
Time grain statistic	Average
Operation	Increase count by
Instance count	1
Cool down (minutes)	5

Note: Obviously these values do not represent a realistic configuration, since their purpose is to trigger autoscaling as soon as possible, without extended wait period.

10. Click **Add** and, back on the **az10408vmss0 - Scaling** blade, specify the following settings (leave others with their default values):

Setting	Value
Instance limits Minimum	1
Instance limits Maximum	3
Instance limits Default	1

11. Click **Save**.
12. In the Azure portal, open the **Azure Cloud Shell** by clicking on the icon in the top right of the Azure Portal.
13. If prompted to select either **Bash** or **PowerShell**, select **PowerShell**.
14. From the Cloud Shell pane, run the following to identify the public IP address of the load balancer in front of the Azure virtual machine scale set **az10408vmss0**.

```
$rgName = 'az104-08-rg02'
```



```
$lbpipName = 'az10408vmss0-lb-publicip'
```

```
$pip = (Get-AzPublicIpAddress -ResourceGroupName $rgName -Name $lbpipName).IpAddress
```

15. From the Cloud Shell pane, 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**.

```
while ($true) { Invoke-WebRequest -Uri "http://$pip" }
```

16. Minimize the Cloud Shell pane but do not close it, switch back to the **az10408vmss0 - Instances** blade and monitor the number of instances.

Note: You might need to wait a couple of minutes and click **Refresh**.

17. Once the third instance is provisioned, navigate to its blade to determine its **Location** (it should be different than the first two zones you identified earlier in this task).

18. Close Cloud Shell pane.

19. On the **az10408vmss0** blade, in the **Settings** section, click **Disks**, click **+ Create and attach a new disk**, and attach a new managed disk with the following settings (leave others with their default values):

Setting	Value
LUN	0
Storage type	Standard HDD
Size (GiB)	32

20. Save the change, in the **Settings** section of the **az10408vmss0** blade, click **Instances**, select the checkboxes next to the instances of the virtual machine scale set, click **Upgrade**, and then, when prompted for confirmation, click **Yes**.

Note: 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. To accomplish this, you will use Azure virtual machine Custom Script extension. First, you will need to remove the existing Custom Script Extension.

21. In the **Settings** section of the **az10408vmss0** blade, click **Extensions and applications**, click **CustomScriptExtension**, and then click **Uninstall**.

Note: Wait for uninstallation to complete.

22. In the Azure portal, open the **Azure Cloud Shell** by clicking on the icon in the top right of the Azure Portal.

23. If prompted to select either **Bash** or **PowerShell**, select **PowerShell**.

24. In the toolbar of the Cloud Shell pane, click the **Upload/Download files** icon, in the drop-down menu, click **Upload** and upload the file `\Allfiles\Labs\08\az104-08-configure_VMSS_disks.ps1` into the Cloud Shell home directory.

25. From the Cloud Shell pane, run the following to display the content of the script:

```
Set-Location -Path $HOME  
Get-Content -Path ./az104-08-configure_VMSS_disks.ps1
```

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

26. From the Cloud Shell pane, run the following to execute the script and configure disks of Azure virtual machine scale set:

```
./az104-08-configure_VMSS_disks.ps1
```

27. Close the Cloud Shell pane.

28. In the **Settings** section of the **az10408vmss0** blade, click **Instances**, select the checkboxes next to the instances of the virtual machine scale set, click **Upgrade**, and then, when prompted for confirmation, click **Yes**.

Clean up resources

Note: Remember to remove any newly created Azure resources that you no longer use. Removing unused resources ensures you will not see unexpected charges.

Note: Don't worry if the lab resources cannot be immediately removed. Sometimes resources have dependencies and take a longer time to delete. It is a common Administrator task to monitor resource usage, so just periodically review your resources in the Portal to see how the cleanup is going. 1. In the Azure portal, open the **PowerShell** session within the **Cloud Shell** pane.

1. Remove az104-08-configure_VMSS_disks.ps1 by running the following command:

```
rm ~\az104-08*
```

2. List all resource groups created throughout the labs of this module by running the following command:

```
Get-AzResourceGroup -Name 'az104-08*'
```

3. Delete all resource groups you created throughout the labs of this module by running the following command:

```
Get-AzResourceGroup -Name 'az104-08*' | Remove-AzResourceGroup -Force -AsJob
```

Note: The command executes asynchronously (as determined by the **-AsJob** parameter), so while you will be able to run another PowerShell command immediately afterwards within the same PowerShell session, it will take a few minutes before the resource groups are actually removed.

Review

In this lab, you have:

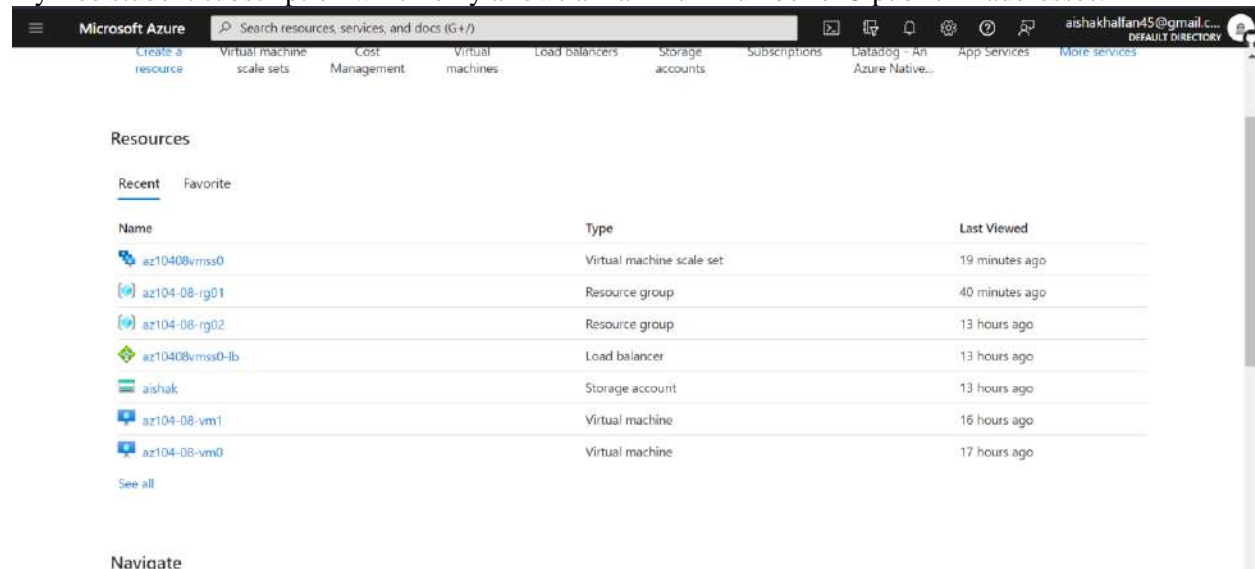
- Deployed zone-resilient Azure virtual machines by using the Azure portal and an Azure Resource Manager template
- Configured Azure virtual machines by using virtual machine extensions
- Scaled compute and storage for Azure virtual machines
- Deployed zone-resilient Azure virtual machine scale sets by using the Azure portal
- Configured Azure virtual machine scale sets by using virtual machine extensions
- Scaled compute and storage for Azure virtual machine scale sets

Conclusion

Failed to update resource 'az10408vmss0'

There was an error updating instance count for resource 'az10408vmss0'. Detail message '{ "error": { "details": [], "code": "PublicIPCountLimitExceededByVMScaleSet", "message": "The requested number of publicIPAddresses 2 for VM Scale Set /subscriptions/3dbbb8d5-1829-48d8-a51d-c7f11b061059/resourceGroups/AZ104-08-

RG02/providers/Microsoft.Compute/virtualMachineScaleSets/az10408vmss0 will exceed the maximum number of publicIPAddresses allowed 3 for subscription 3dbbb8d5-1829-48d8-a51d-c7f11b061059." } }', Please try again in a few moments. This error really prevented me from tackling fully task 7. This is due to my free student subscription which only allows a maximum number of 3 public IP addresses.



This report highlights the deployment and management of zone-resilient Azure virtual machines and scale sets. Using the Azure portal and Resource Manager templates, we achieved fault tolerance across multiple availability zones. Virtual machine extensions were employed for efficient configuration, ensuring a customized and easily maintainable environment. The report also emphasizes the scalability of compute

and storage resources, enabling dynamic adaptation to varying workloads. Overall, these implementations align with best practices, establishing a resilient, high-performance cloud infrastructure