



DEMO: Implementing a VM Scale Set with Autoscaling

Author: Saurav Raghuvanshi

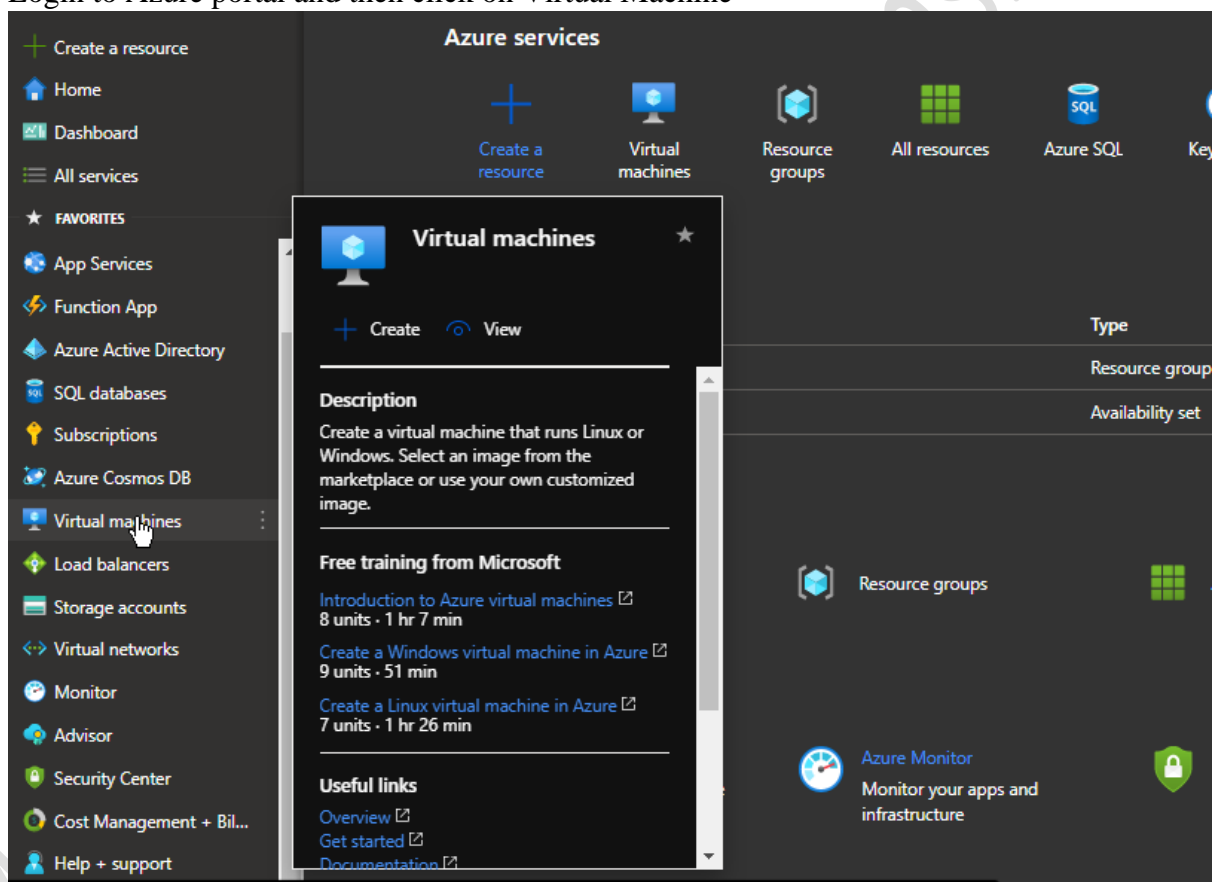
Aim: Creating a Web App from Azure Command Line Interface

Some Useful Link:

- Azure free Tier account creation: <https://azure.microsoft.com/en-us/free/>
- Azure Portal: <https://portal.azure.com/#home>
- Service Categories: <https://azure.microsoft.com/services/>
- Designing a Solution: <https://docs.microsoft.com/azure/architecture/>

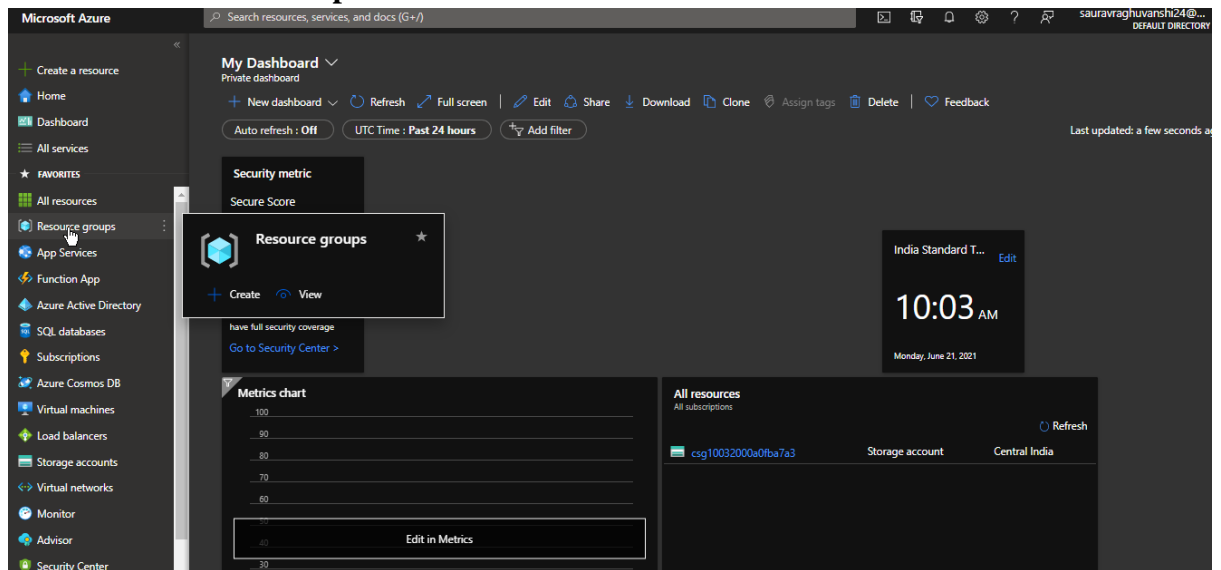
Instructions:

1. Login to Azure portal and then click on Virtual Machine

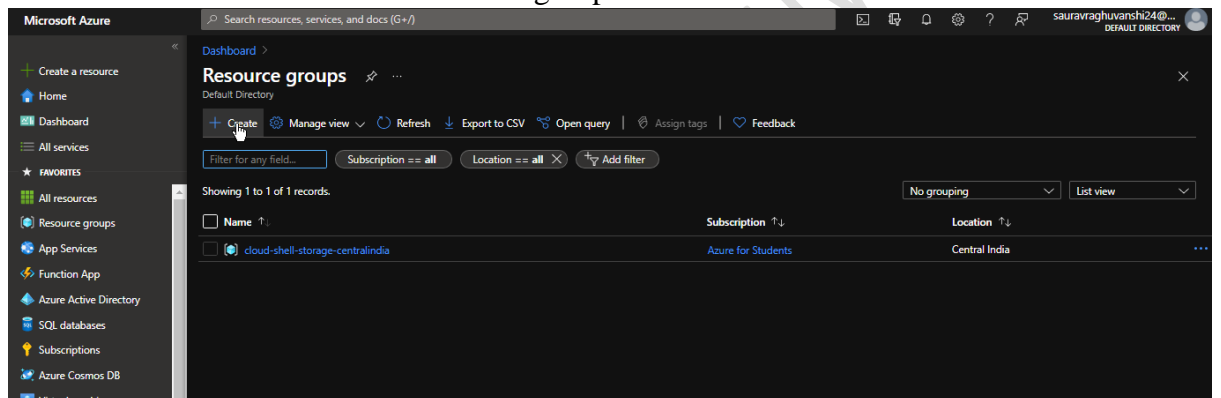


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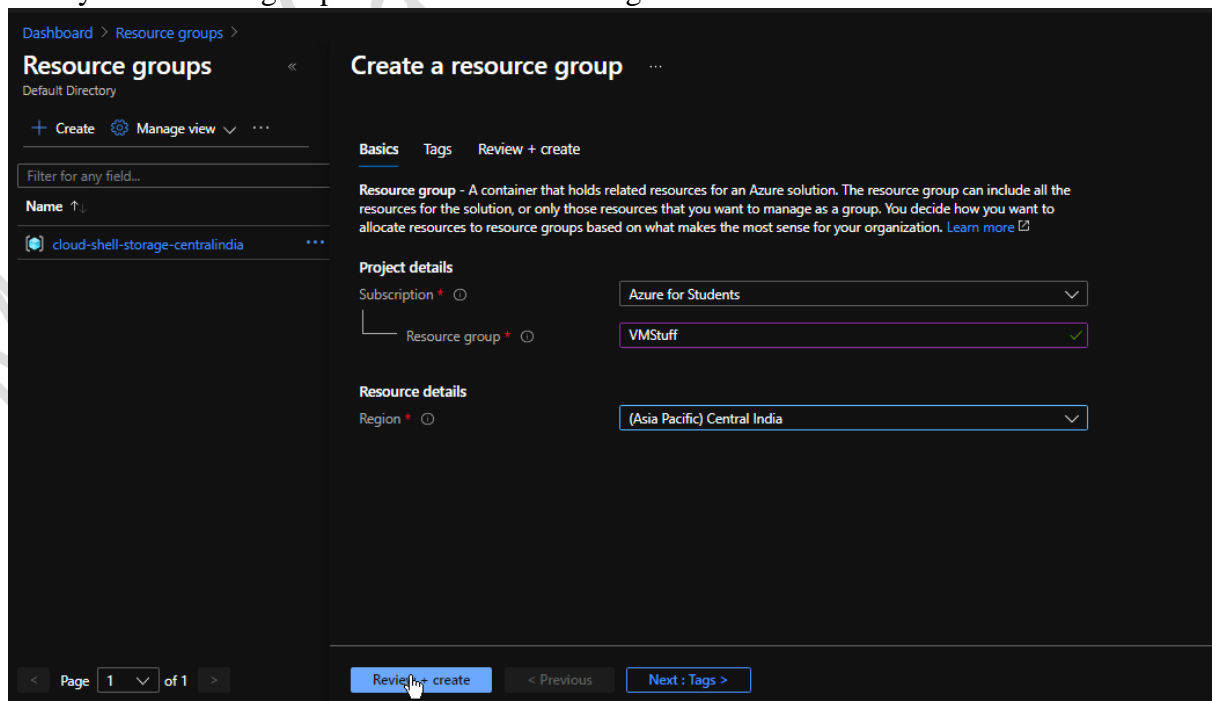
2. Click on Resource Groups



3. Click on Create to create a new resource group

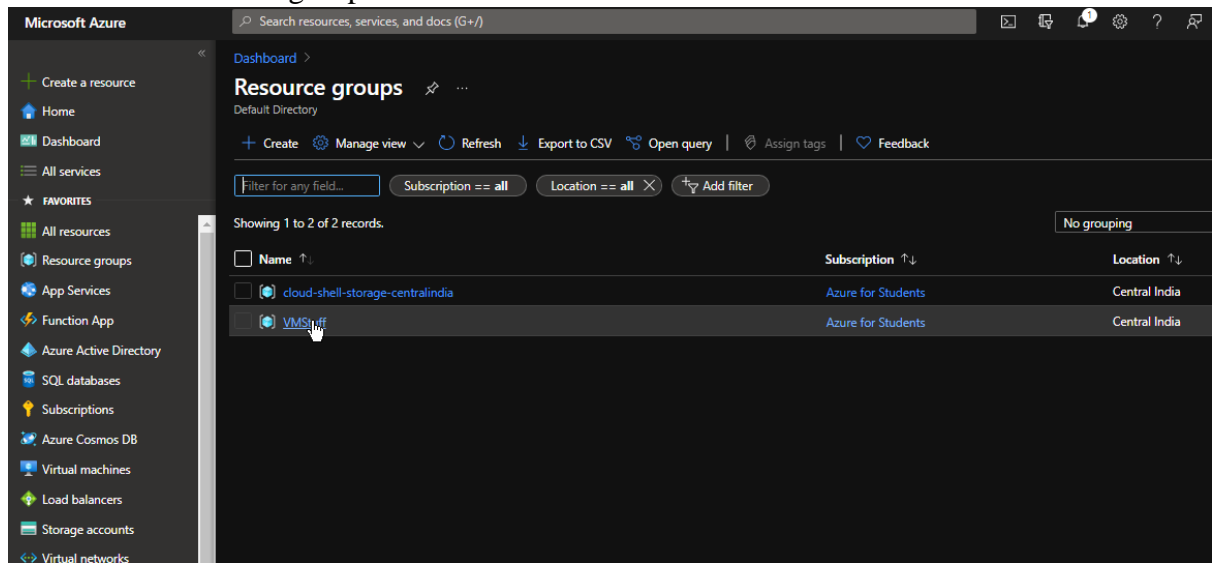


4. Give your resource group a name and select a region then click on Review and Create

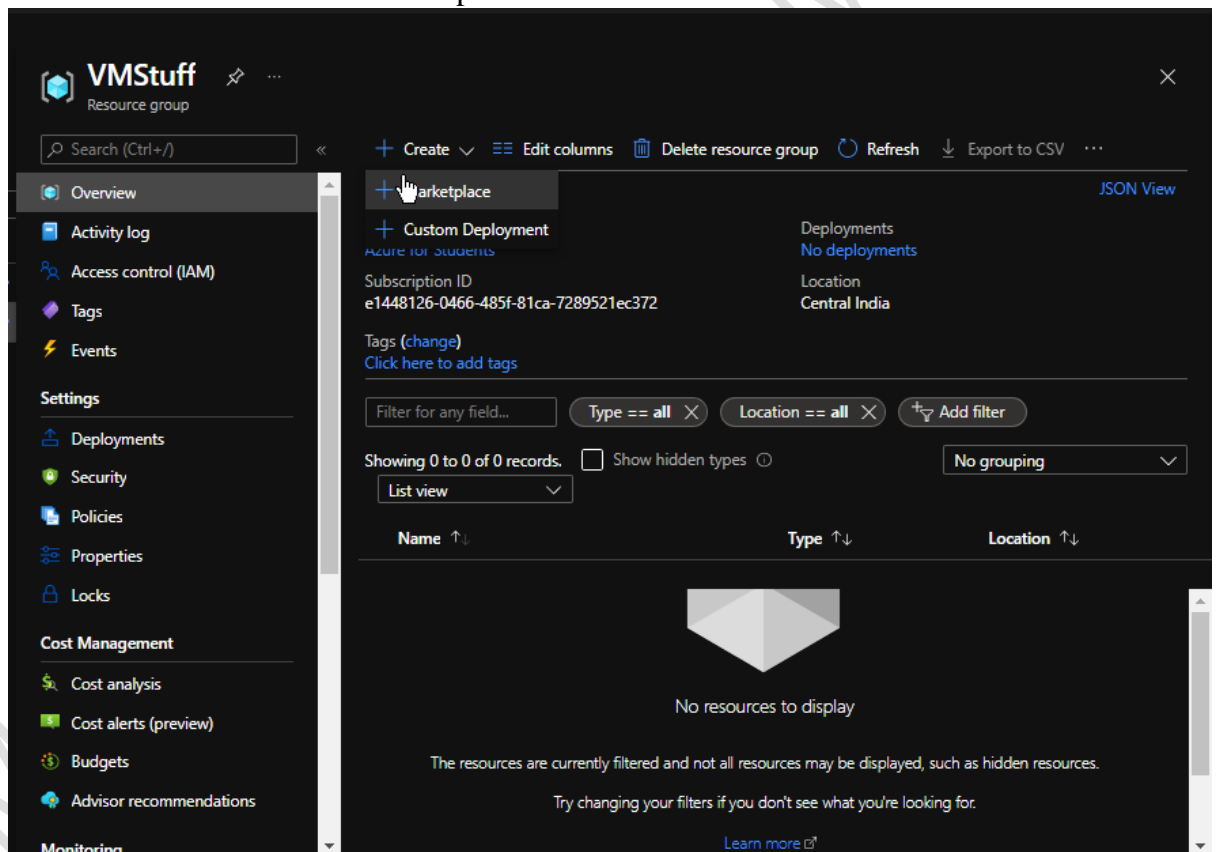


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5. Click on the resource group

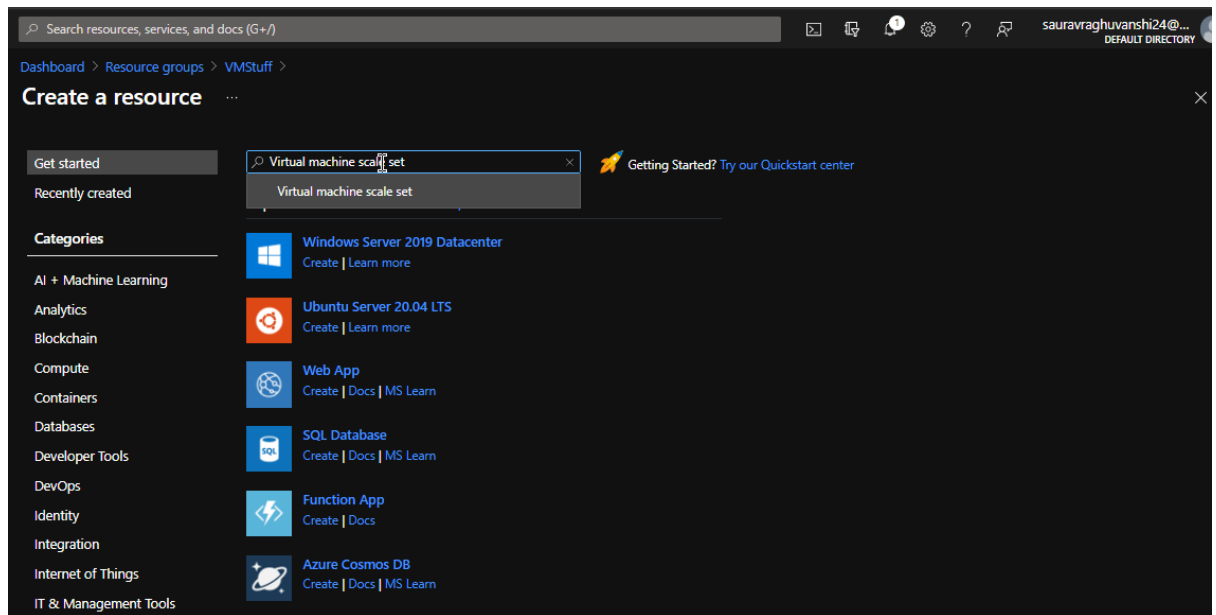


6. Click on Create then click Marketplace

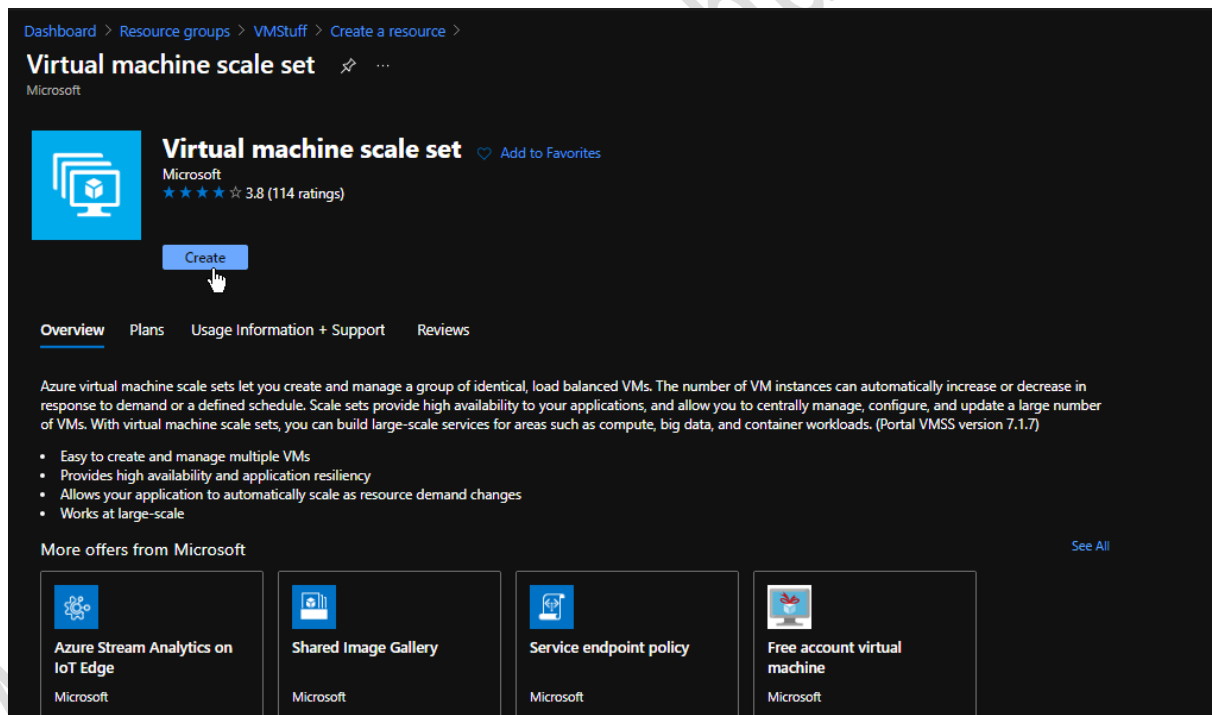


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7. Search for Virtual Machine Scale Set



8. Click on Create



9. Give your VM Scale Set a name, select the image type and then give username and password and then click on next

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Create a virtual machine scale set

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 * ▼ VMStuff
[Create new](#)

Scale set details

Virtual machine scale set name * ✓ MyScaleSet

Region * ▼ (Asia Pacific) Central India

Availability zone ⓘ ▼ None
No availability zones are available for the location you have selected. [View locations that support availability zones](#)

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](#)

Default: Standard. [Uniform](#) optimized for large scale datasets workload with identical

[Dashboard](#) > [Resource groups](#) > [VMStuff](#) > [Create a resource](#) > [Virtual machine scale set](#) >

Create a virtual machine scale set

Instance details

Image * ⓘ ▼ Windows Server 2019 Datacenter - Gen1
[See all images](#)

Azure Spot instance ⓘ ☐

Size * ⓘ ▼ Standard_D2s_v3 - 2 vcpus, 8 GiB memory (₹10,360.83/month)
[See all sizes](#)

Administrator account

Username * ⓘ saurav ✓

Password * ⓘ ✓

Confirm password * ⓘ ✓

Licensing

Save up to 49% with a license you already own using Azure Hybrid Benefit. [Learn more](#)

Would you like to use an existing Windows Server license? * ⓘ ☐

[Review Azure hybrid benefit compliance](#)

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

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10. Leave everything default on the Disks page and click on next

Dashboard > Resource groups > VMStuff > Create a resource > Virtual machine scale set >

Create a virtual machine scale set

Azure VMs have one operating system disk and a temporary disk for short-term storage. You can attach additional data disks. The size of the VM determines the type of storage you can use and the number of data disks allowed. [Learn more](#)

Disk options

OS disk type *

Encryption type *

Enable Ultra Disk compatibility ☐ Ultra Disk compatibility is not available for this VMSS size and location.

Data disks

You can add and configure additional data disks for your virtual machine or attach existing disks. This VM also comes with a temporary disk.

LUN	Name	Size (GiB)	IOPS	THRO...	Disk type	Host caci
Create and attach a new disk						

Advanced

[Review + create](#) [< Previous](#) [Next : Networking >](#)

11. Click on edit Network Interface to allow RDP port and enable **Public IP** and click Ok

Dashboard > Resource groups > VMStuff > Create a resource > Virtual machine scale set > Create a virtual machine scale set >

Edit network interface

NIC network security group ☐ None ☒ Basic ☐ Advanced

Public inbound ports * ☐ None ☒ Allow selected ports

*Select inbound ports

Warning: This will allow all IP addresses to access your virtual machine. This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.

Public IP address ☐ Disabled ☒ Enabled

Accelerated networking ☐ Disabled ☒ Enabled

[OK](#) [Cancel](#)

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12. Click on use load balancer and leave everything default and then click Next

Dashboard > Resource groups > VMStuff > Create a resource > Virtual machine scale set >

Create a virtual machine scale set

NAME	CREATE PUBLI...	SUBNET	NETWORK SECU...	ACCELERATED N...
VMStuff-vnet-nic01	Yes	default (10.0.0.0/16)	Basic	Off

Load balancing

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

Use a load balancer ☒

Load balancing settings

- Application Gateway** is an HTTP/HTTPS web traffic load balancer with URL-based routing, SSL termination, session persistence, and web application firewall. [Learn more about Application Gateway](#)
- Azure Load Balancer** supports all TCP/UDP network traffic, port-forwarding, and outbound flows. [Learn more about Azure Load Balancer](#)

Load balancing options * ☐ Azure load balancer

Select a load balancer * ☐ (new) MyScaleSet-lb
[Create new](#)

Select a backend pool * ☐ (new) bepool
[Create new](#)

13. In this page select select Scaling policy as custom and in the scale out option change the value to 50 and 5 and then click next

Dashboard > Resource groups > VMStuff > Create a resource > Virtual machine scale set >

Create a virtual machine scale set

Scaling

Scaling policy ☐ Manual ☒ Custom

Minimum number of instances * ☐ 1

Maximum number of instances * ☐ 10

Scale out

CPU threshold (%) * ☐ 50 ✓

Duration in minutes * ☐ 5 ✓

Number of instances to increase by * ☐ 1 ✓

Scale in

CPU threshold (%) * ☐ 25

Number of instances to decrease by * ☐ 1 ✓

Diagnostic logs

Collect diagnostic logs from Autoscale ☐

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

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14. Leave everything default here and then click on Next for Health Option

Dashboard > Resource groups > VMStuff > Create a resource > Virtual machine scale set >

Create a virtual machine scale set

Azure AD

Login with Azure AD ☐

Overprovisioning

With overprovisioning turned on, the scale set actually spins up more VMs than you asked for, then deletes the extra VMs once the requested number of VMs are successfully provisioned. Overprovisioning improves provisioning success rates and reduces deployment time. You are not billed for the extra VMs, and they do not count toward your quota limits. [Learn more about overprovisioning](#)

Enable overprovisioning ☒

Automatic OS upgrades

Enable automatic OS upgrades ☐

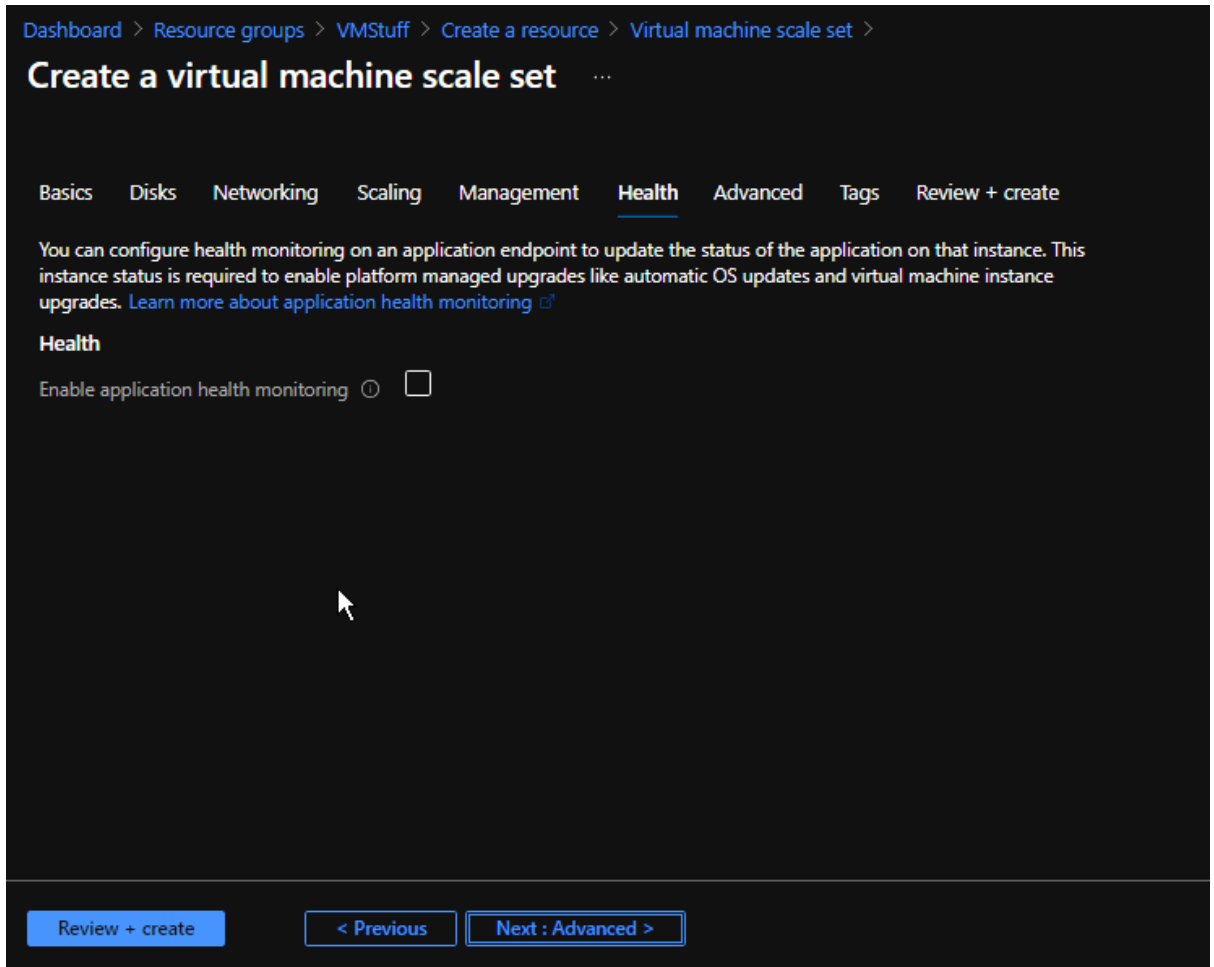
Instance termination

Enable instance termination notification ☐

[Review + create](#) [< Previous](#) [Next : Health >](#)

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15. Click on Next



The screenshot shows the 'Create a virtual machine scale set' page in the Azure portal, specifically the 'Health' tab. The breadcrumb navigation at the top reads: Dashboard > Resource groups > VMStuff > Create a resource > Virtual machine scale set >. The page title is 'Create a virtual machine scale set' followed by an ellipsis. The tabs at the top are: Basics, Disks, Networking, Scaling, Management, Health (selected), Advanced, Tags, and Review + create. A descriptive paragraph states: 'You can configure health monitoring on an application endpoint to update the status of the application on that instance. This instance status is required to enable platform managed upgrades like automatic OS updates and virtual machine instance upgrades. [Learn more about application health monitoring](#).' Below this, under the 'Health' section, there is a toggle for 'Enable application health monitoring' which is currently turned off (checkbox is empty). At the bottom, there are three buttons: 'Review + create' (highlighted in red), '< Previous', and 'Next : Advanced >' (highlighted with a red border).

Dashboard > Resource groups > VMStuff > Create a resource > Virtual machine scale set >

Create a virtual machine scale set ...

Basics Disks Networking Scaling Management **Health** Advanced Tags Review + create

You can configure health monitoring on an application endpoint to update the status of the application on that instance. This instance status is required to enable platform managed upgrades like automatic OS updates and virtual machine instance upgrades. [Learn more about application health monitoring](#)

Health

Enable application health monitoring ☐

[Review + create](#) [< Previous](#) [Next : Advanced >](#)

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16. Leave everything default and then click on next

Dashboard > Resource groups > VMStuff > Create a resource > Virtual machine scale set >

Create a virtual machine scale set

Basics Disks Networking Scaling Management Health Advanced Tags Review + create

Add additional configuration, agents, scripts or applications via virtual machine extensions or cloud-init.

Allocation policy

Enable scaling beyond 100 instances ☒

Spreading algorithm ☐ Max spreading
☒ Fixed spreading (not recommended with zones)

Fault domain count *

Custom data

Pass a script, configuration file, or other data into the virtual machine **while it is being provisioned**. The data will be saved on the VM in a known location. [Learn more about custom data for VMSS](#)

Custom data

[Review + create](#) [< Previous](#) [Next : Tags >](#)

17. Click on Next: Review and Create

Dashboard > Resource groups > VMStuff > Create a resource > Virtual machine scale set >

Create a virtual machine scale set

Basics Disks Networking Scaling Management Health Advanced Tags Review + create

Tags are name/value pairs that enable you to categorize resources and view consolidated billing by applying the same tag to multiple resources and resource groups. [Learn more about tags](#)

Note that if you create tags and then change resource settings on other tabs, your tags will be automatically updated.

Name	Value	Resource
<input type="text"/>	:	<input type="text" value="8 selected"/>

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

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18. Click on Create

Dashboard > Resource groups > VMStuff > Create a resource > Virtual machine scale set >

Create a virtual machine scale set

✓ Validation passed

Basics Disks Networking Scaling Management Health Advanced Tags **Review + create**

Basics

Subscription	Azure for Students
Resource group	VMStuff
Virtual machine scale set name	MyScaleSet
Region	Central India
Orchestration mode	Uniform
Availability zone	None
Image	Windows Server 2019 Datacenter - Gen1
Size	Standard D2s v3 (2 vCPUs, 8 GiB memory)
Username	saurav
Azure Spot	No

Instance

Initial instance count	2
Already have a Windows license?	No

Create < Previous Next > Download a template for automation

19. Wait for few minutes and then go to resource

Search resources, services, and docs (G+)

Dashboard > CreateVmss-MicrosoftWindowsServer.WindowsServer-2-20210621110635 >

MyScaleSet

Virtual machine scale set

Search (Ctrl+/) << Start Restart Stop Move Delete Refresh

Overview

- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems

Settings

- Instances
- Networking
- Scaling
- Disks
- Operating system
- Security
- Guest + host updates
- Size
- Extensions
- Continuous delivery
- Configuration

Essentials

Resource group (change)	VMStuff	Operating system	Windows
Status	2 out of 2 succeeded	Size	Standard_D2s_v3 (2 instances)
Location	Central India	Public IP address	40.80.93.39
Subscription (change)	Azure for Students	Public IP address (IPv6)	-
Subscription ID	e1448126-0466-485f-81ca-7289521ec372	Virtual network/subnet	VMStuff-vnet/default
		Orchestration mode	Uniform

Tags (change)
[Click here to add tags](#)

Properties Monitoring Capabilities (6) Recommendations Tutorials

Virtual machine profile

Operating system	Windows
Publisher	MicrosoftWindowsServer
Offer	WindowsServer

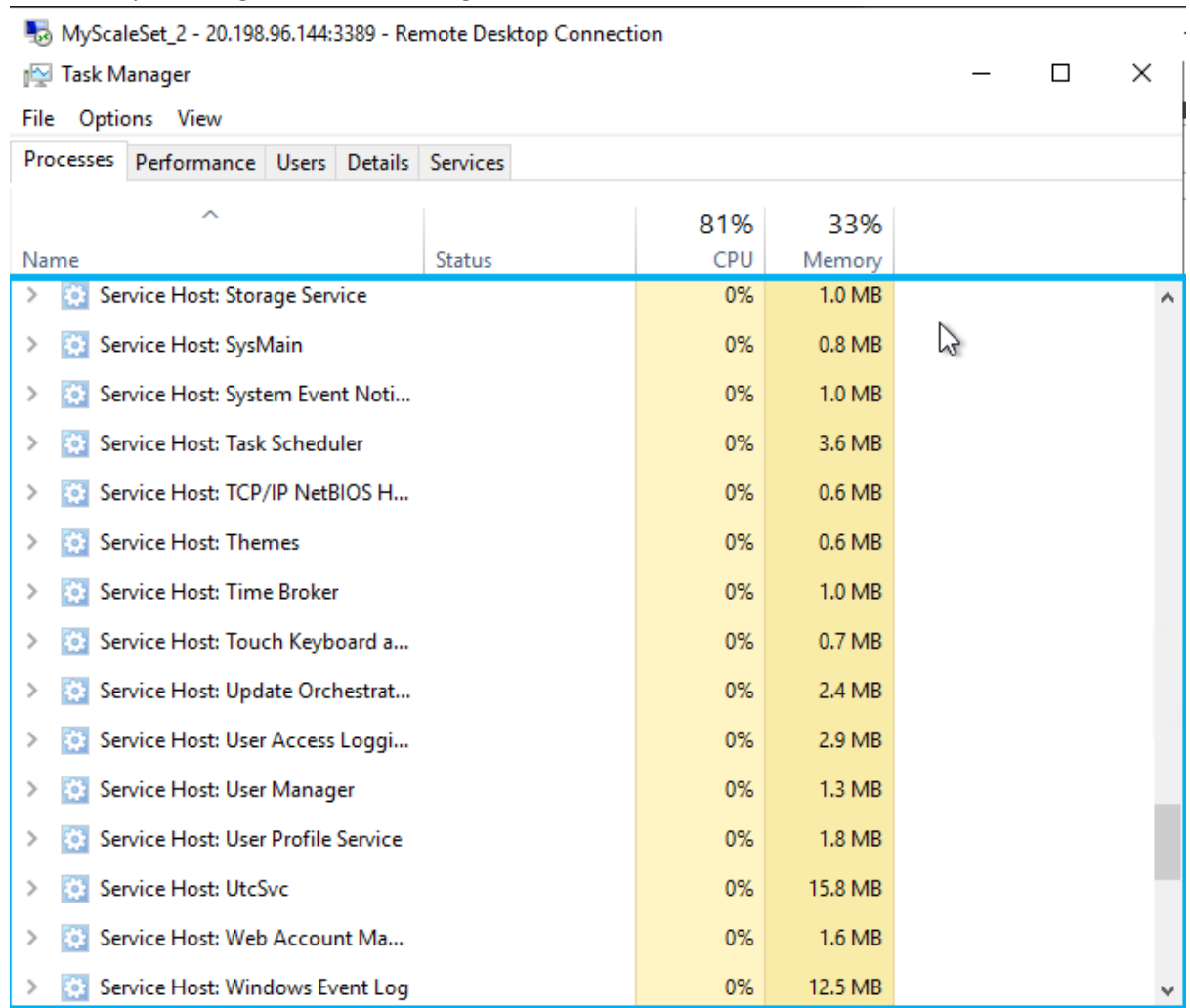
Networking

Public IP address	-
Public IP address (IPv6)	-
Virtual network/subnet	VMStuff-vnet/default

20. RDP to any one of the instances and then run multiple application so that CPU utilization cross 50%. For this run Window Defender for full scan and check the CPU

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utilization percentage from Task Manager.



The screenshot shows the Windows Task Manager Performance tab. The CPU usage is 81% and Memory usage is 33%. Below the usage bars, a list of system services is displayed with their respective CPU and Memory usage.

Name	Status	CPU	Memory
> Service Host: Storage Service		0%	1.0 MB
> Service Host: SysMain		0%	0.8 MB
> Service Host: System Event Noti...		0%	1.0 MB
> Service Host: Task Scheduler		0%	3.6 MB
> Service Host: TCP/IP NetBIOS H...		0%	0.6 MB
> Service Host: Themes		0%	0.6 MB
> Service Host: Time Broker		0%	1.0 MB
> Service Host: Touch Keyboard a...		0%	0.7 MB
> Service Host: Update Orchestrat...		0%	2.4 MB
> Service Host: User Access Loggi...		0%	2.9 MB
> Service Host: User Manager		0%	1.3 MB
> Service Host: User Profile Service		0%	1.8 MB
> Service Host: UtcSvc		0%	15.8 MB
> Service Host: Web Account Ma...		0%	1.6 MB
> Service Host: Windows Event Log		0%	12.5 MB

21. Now you can able to see that a new VM is created after the threshold is reached



Congratulations we have deployed VM Scale Set with Load balancer and implemented Auto Scaling 😊😊