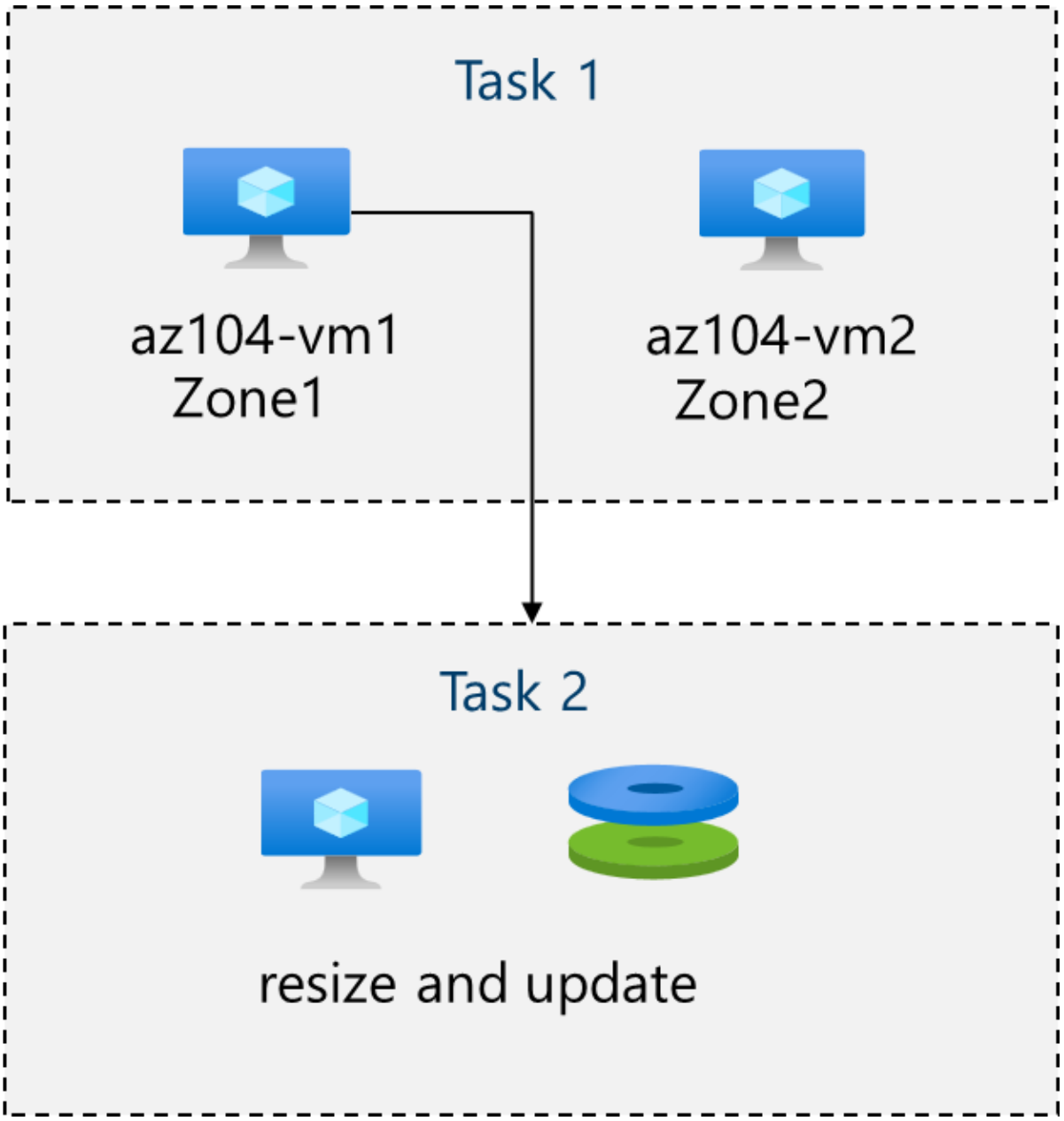


AZ-104 Lab 08: Manage Virtual Machines

Author: Muhammad Ellahi
Environment: Azure Portal (Campus Lab)
Security Note: Screenshots only — no screen recordings or exposed credentials.

Lab Overview

This lab explores the deployment and scaling of Azure Virtual Machines (VMs) and Virtual Machine Scale Sets (VMSS).
You'll manually deploy zone-resilient VMs, scale compute and storage resources, and prepare for autoscaling via VMSS.

Task 1: Deploy Zone-Resilient Azure Virtual Machines

Objective:
Deploy two virtual machines across different availability zones to achieve a 99.99% uptime SLA.

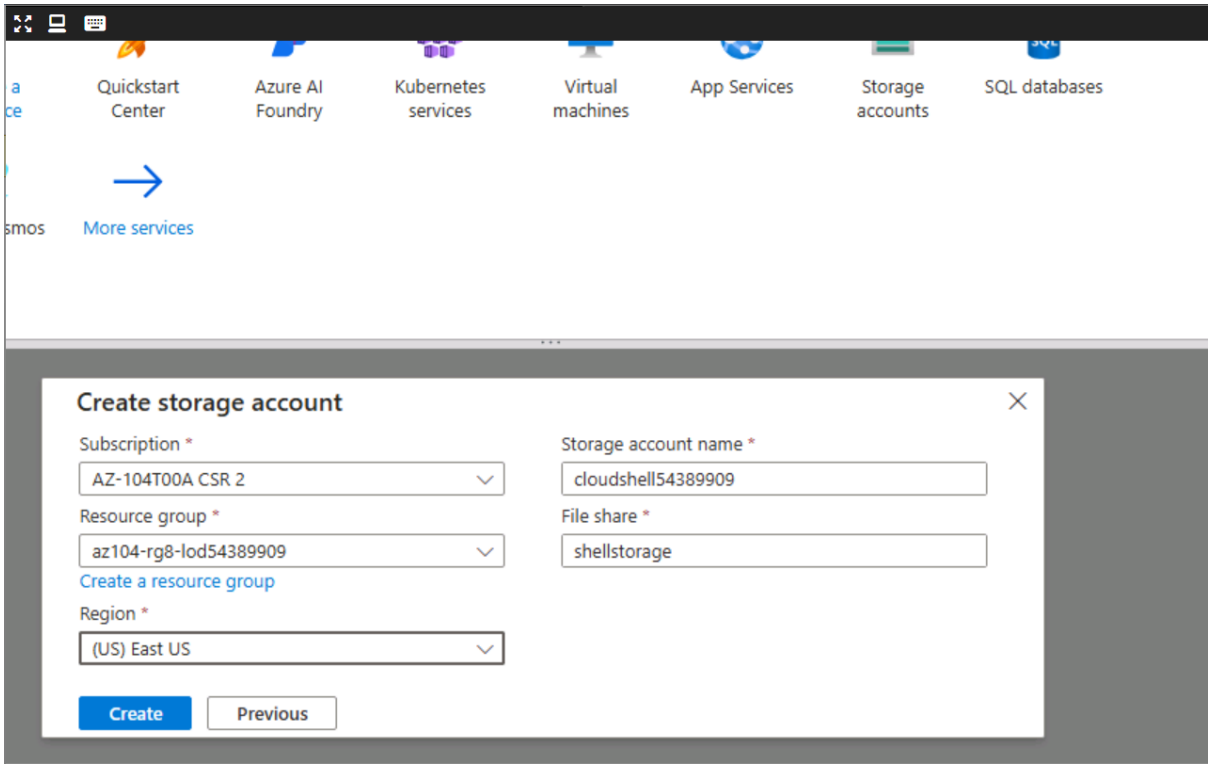
Steps Taken:

1. Signed into Azure Portal
2. Navigated to **Virtual Machines > + Create > Azure Virtual Machine**
3. Selected **Zone 1 and Zone 2** under Availability Zone
4. Configured the following settings:

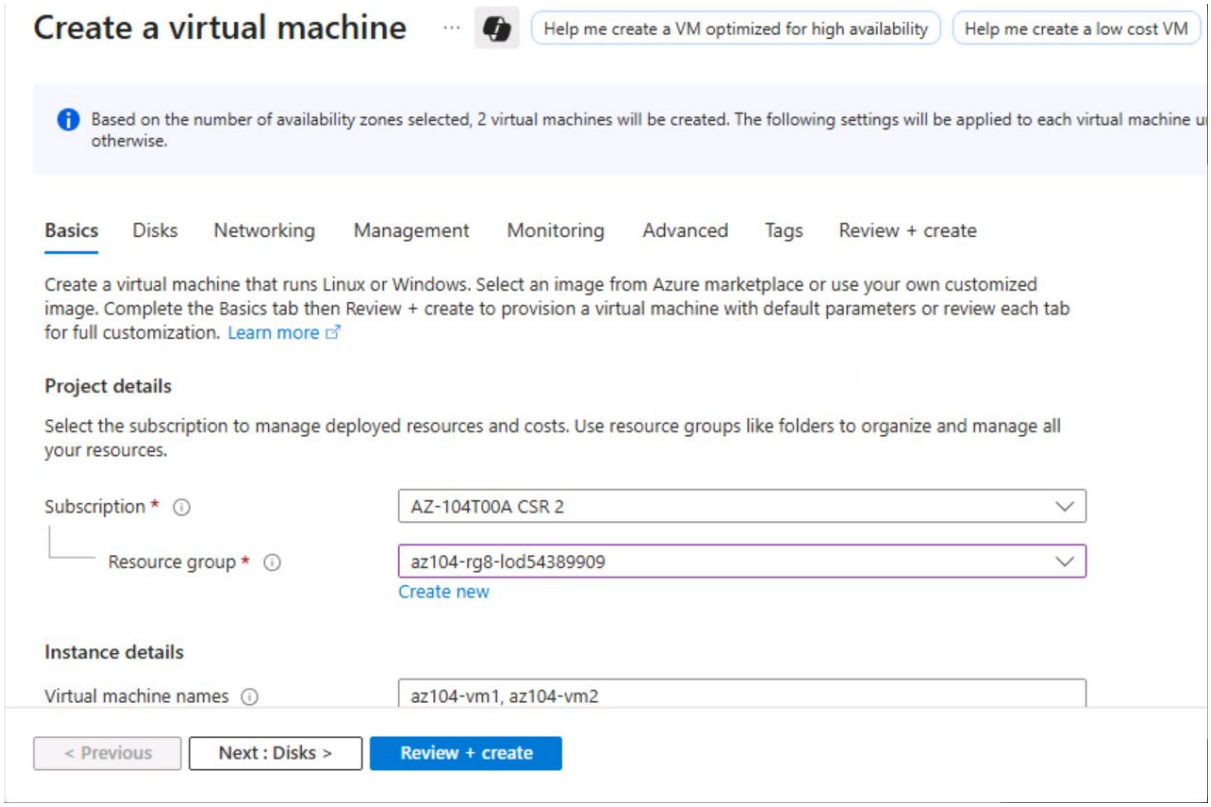
Setting	Value
Resource Group	az104-rg8
VM Names	az104-vm1, az104-vm2
Region	East US
Image	Windows Server 2019 Datacenter - x64 Gen2
Size	Standard D2s v3
Username	localadmin
Password	[Secure]
Public Inbound Ports	None
OS Disk Type	Premium SSD
NIC & Public IP	Delete on VM deletion
Load Balancer	None
Patch Orchestration	Azure orchestrated
Boot Diagnostics	Disabled

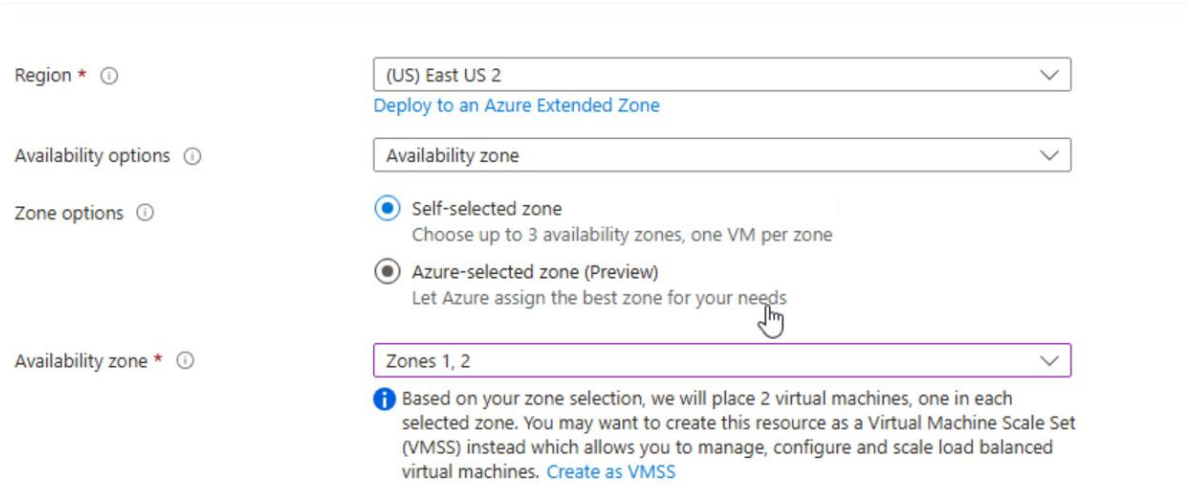
Screenshot Checklist:

1. created a storage account using the cloud shell

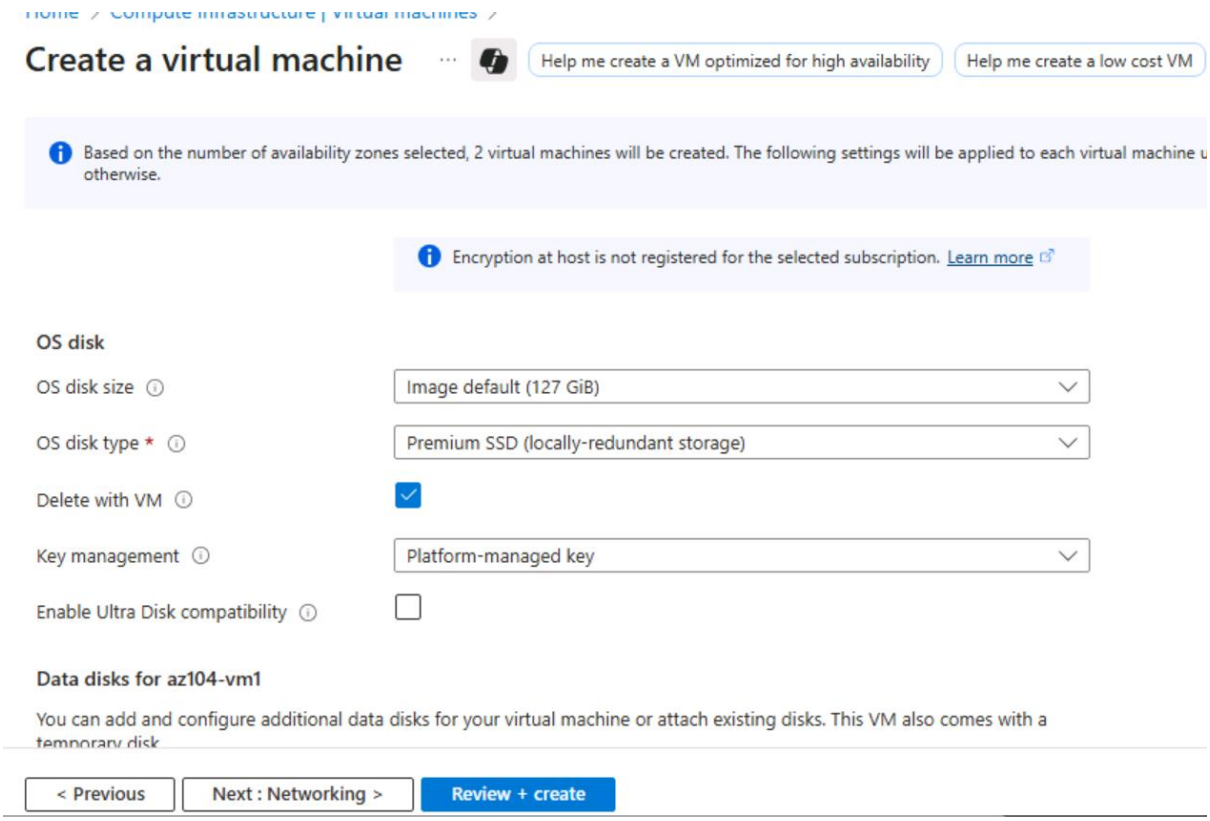


☑ VM creation page with both zones selected

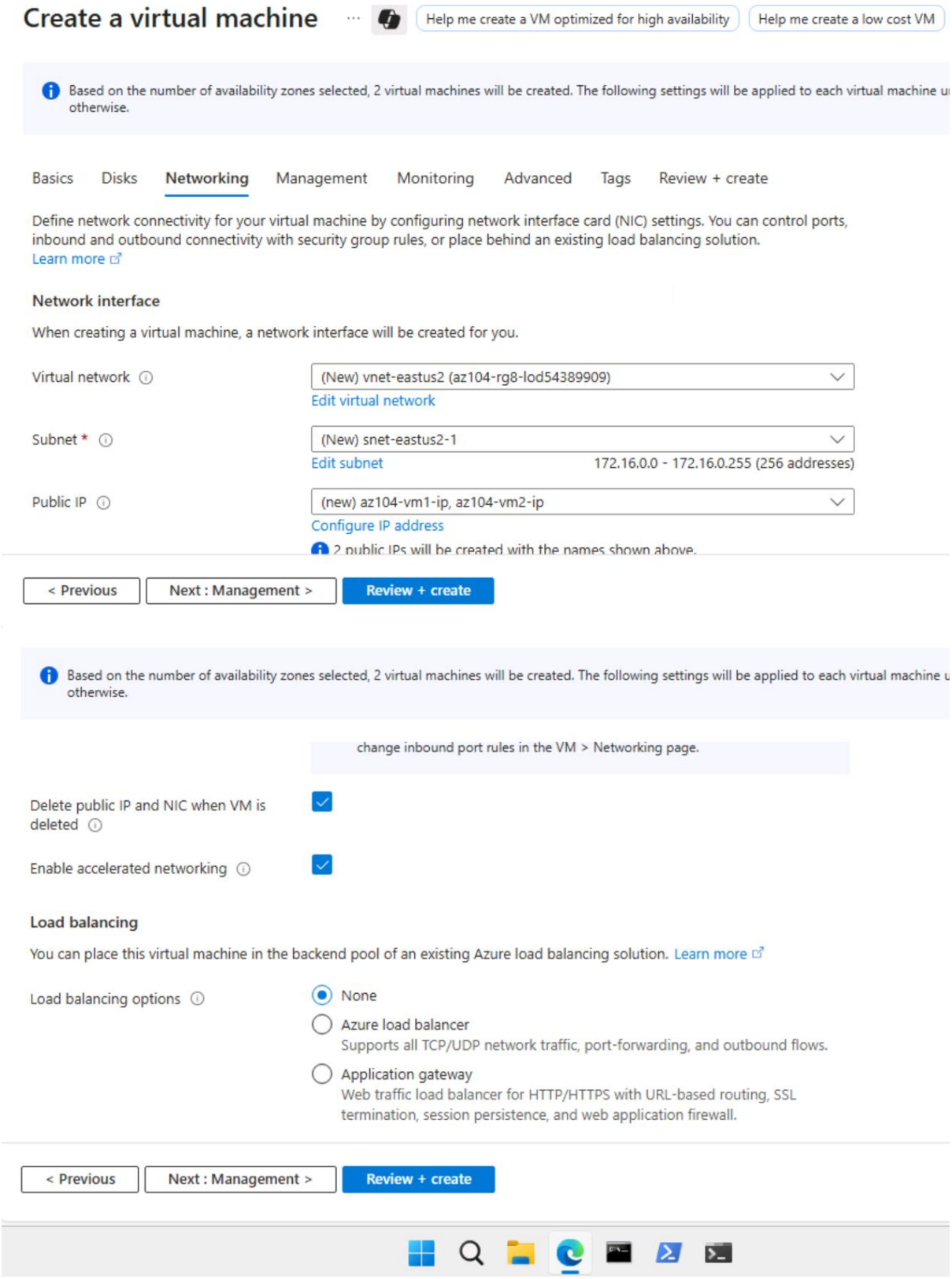




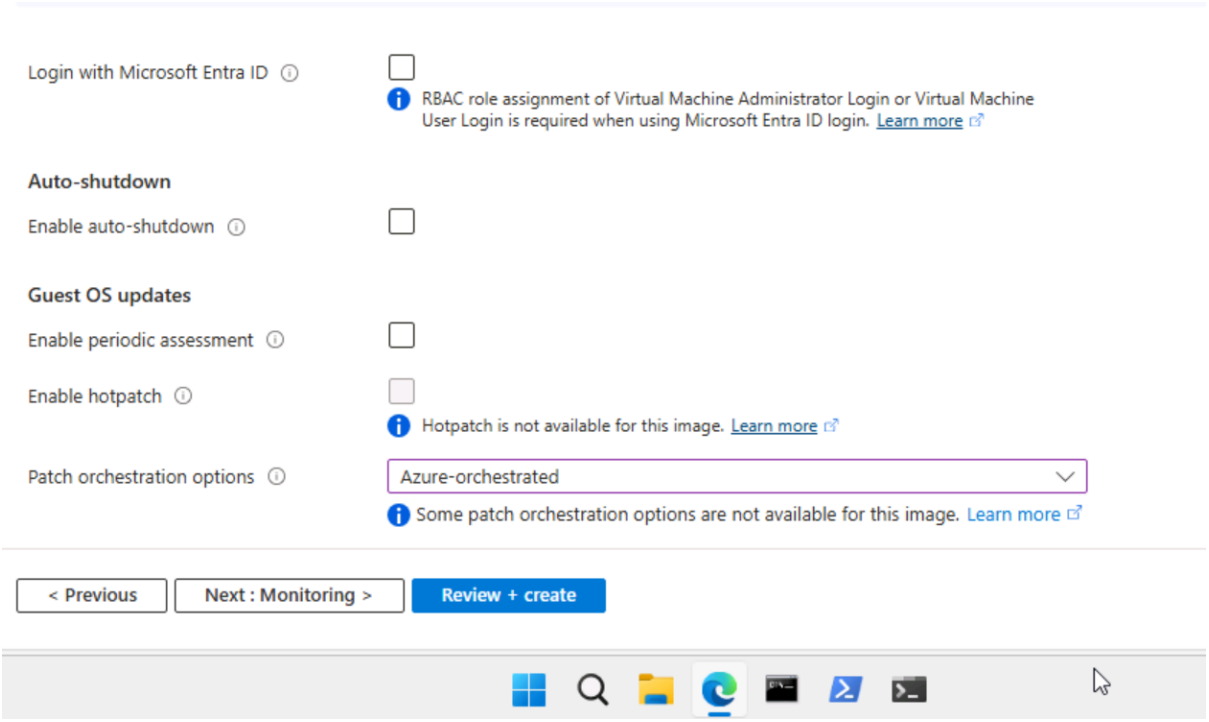
☑ Disk configuration (Premium SSD)



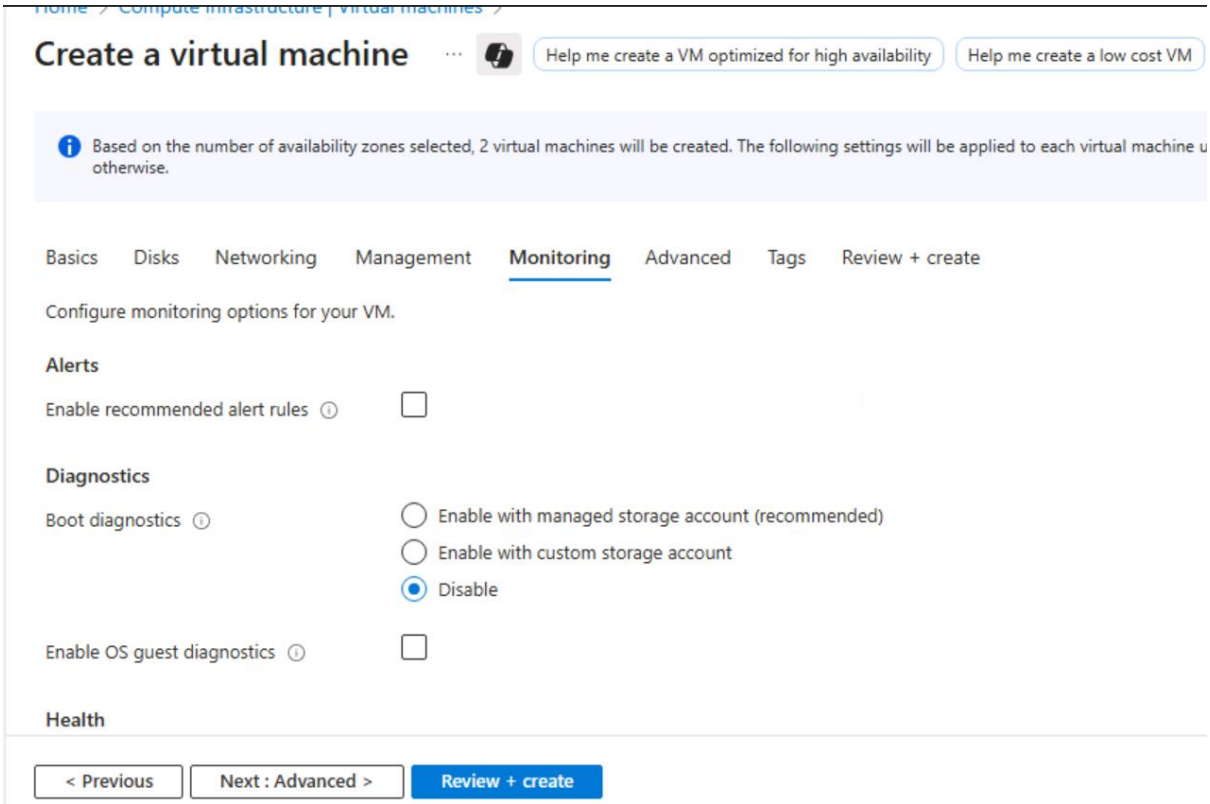
☑ Networking tab showing no load balancer



☑ Management tab with patch orchestration

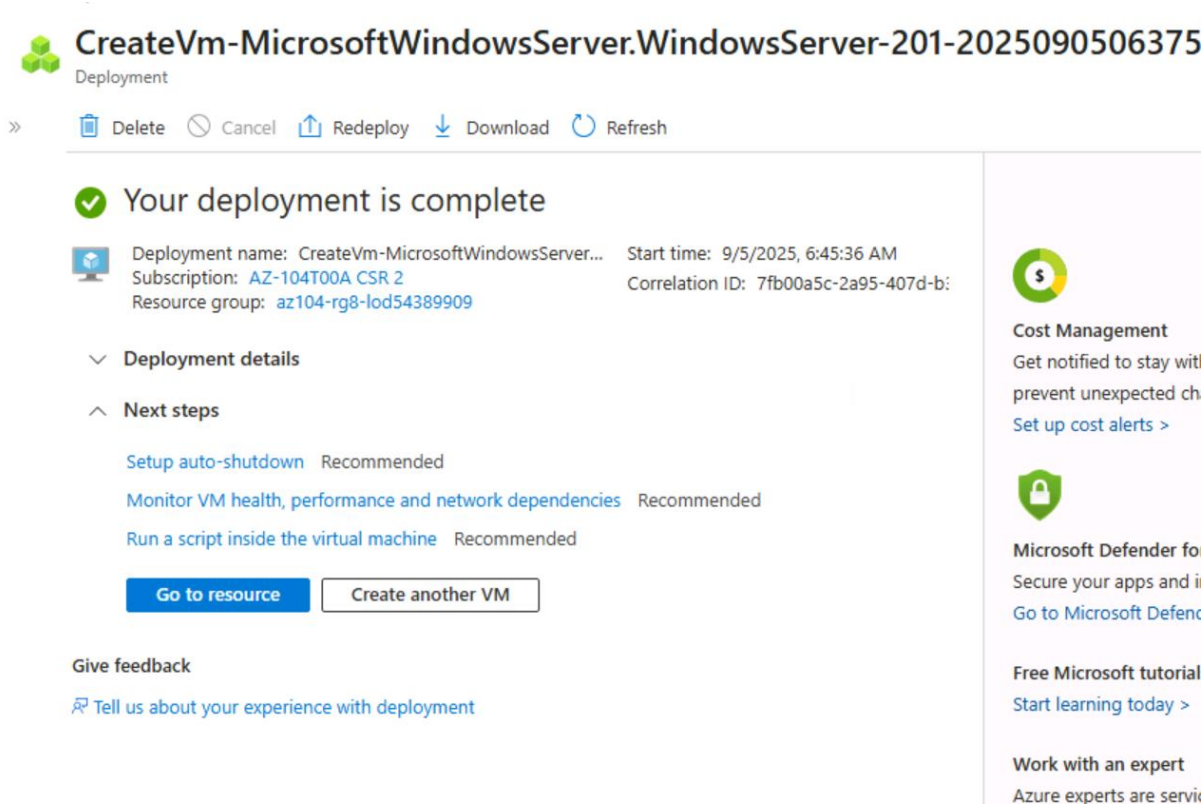


☑ Monitoring tab with Boot Diagnostics disabled



☑ Final Review + Create screen

☑ Deployment complete notification



Notes:

- VM deployment automatically created NICs, disks, and public IPs as separate resources
- Availability Zones ensure high SLA and fault tolerance

🛠️ Task 2: Manage Compute and Storage Scaling for Virtual Machines

Objective:
Vertically scale VM compute resources and modify attached disk performance.

Steps Taken:

1. Navigated to az104-vm1 > Availability + scale > Size
2. Changed VM size to D2ds_v4 and confirmed resize
3. Added a new data disk:

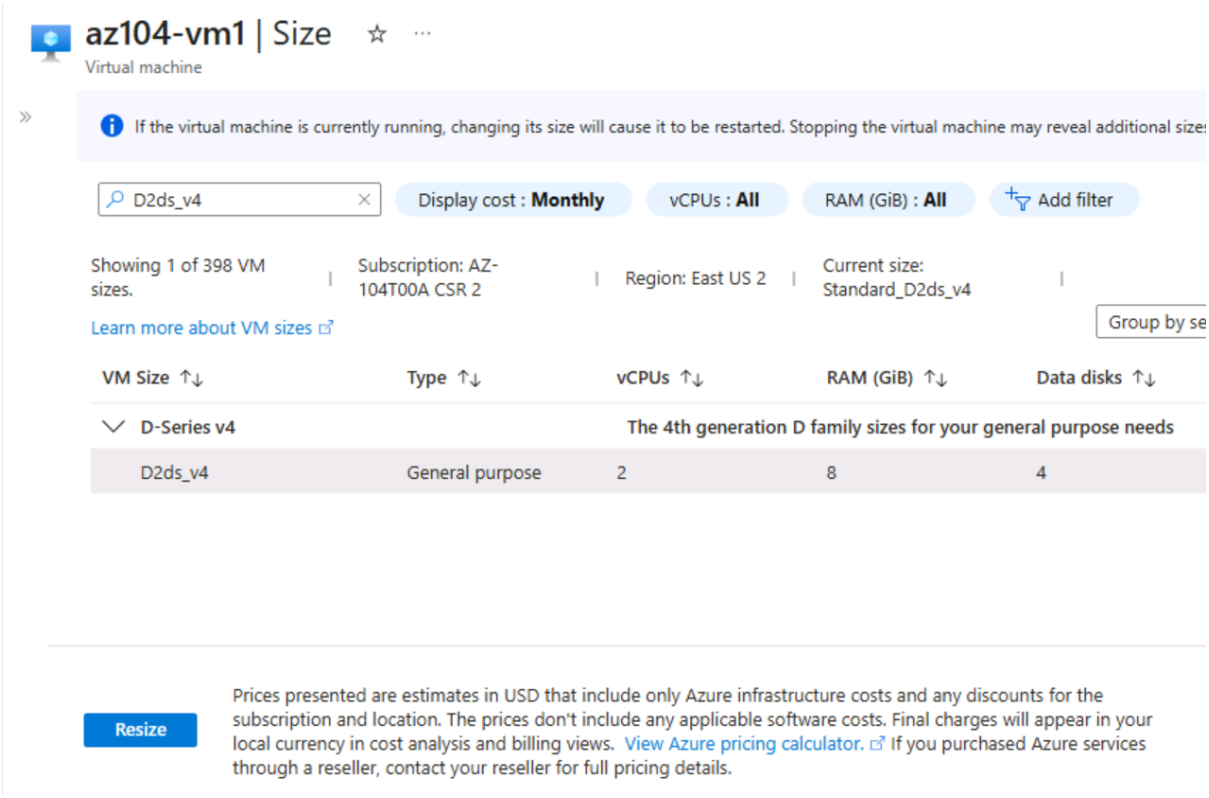
Setting	Value
Disk Name	vm1-disk1
Storage Type	Standard HDD
Size	32 GiB

4. Detached the disk

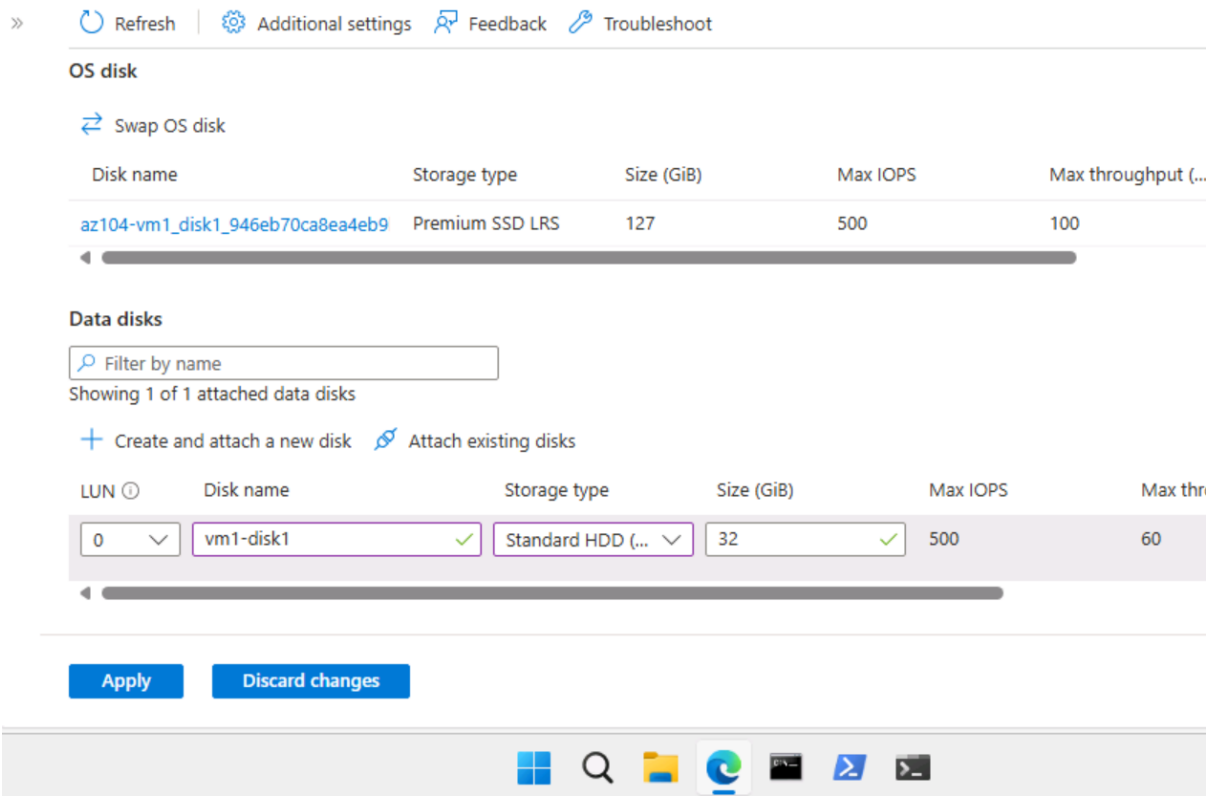
5. Navigated to **Disks > vm1-disk1 > Size + performance**
6. Changed storage type to **Standard SSD**
7. Reattached disk to az104-vm1 and verified SSD upgrade

Screenshot Checklist:

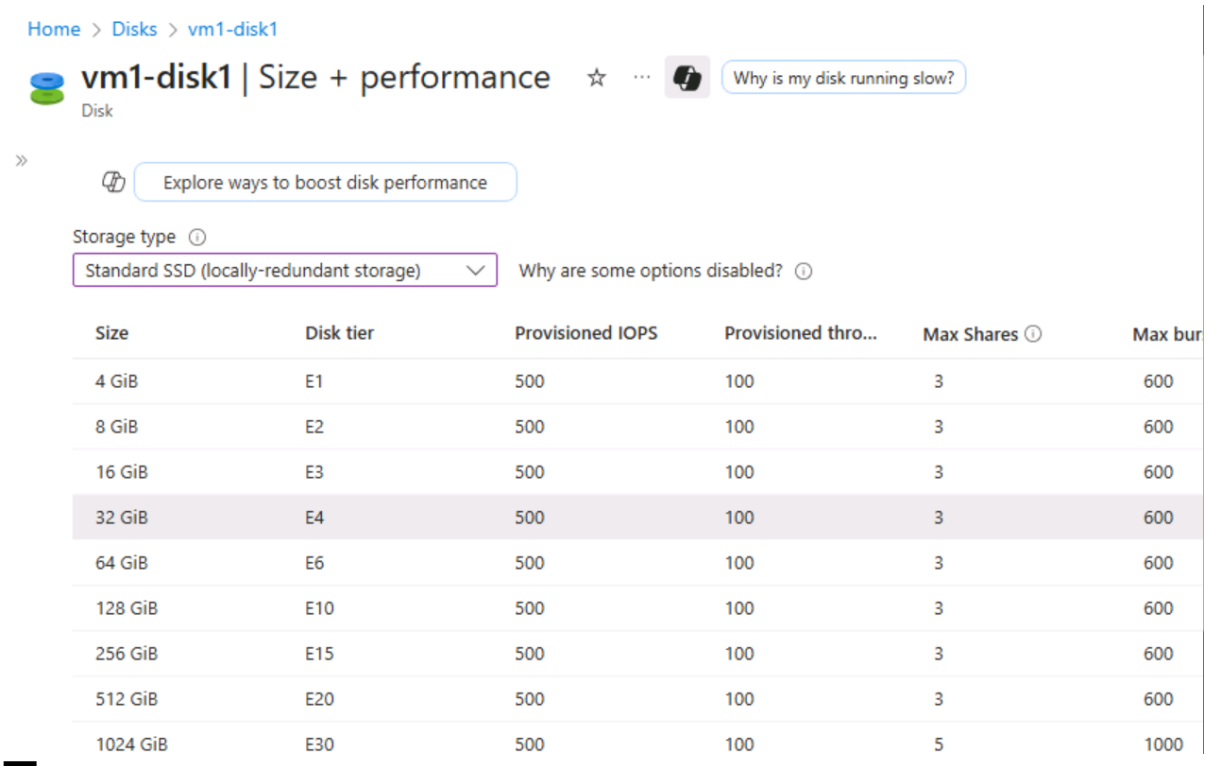
✅ VM size change confirmation (D2ds_v4)



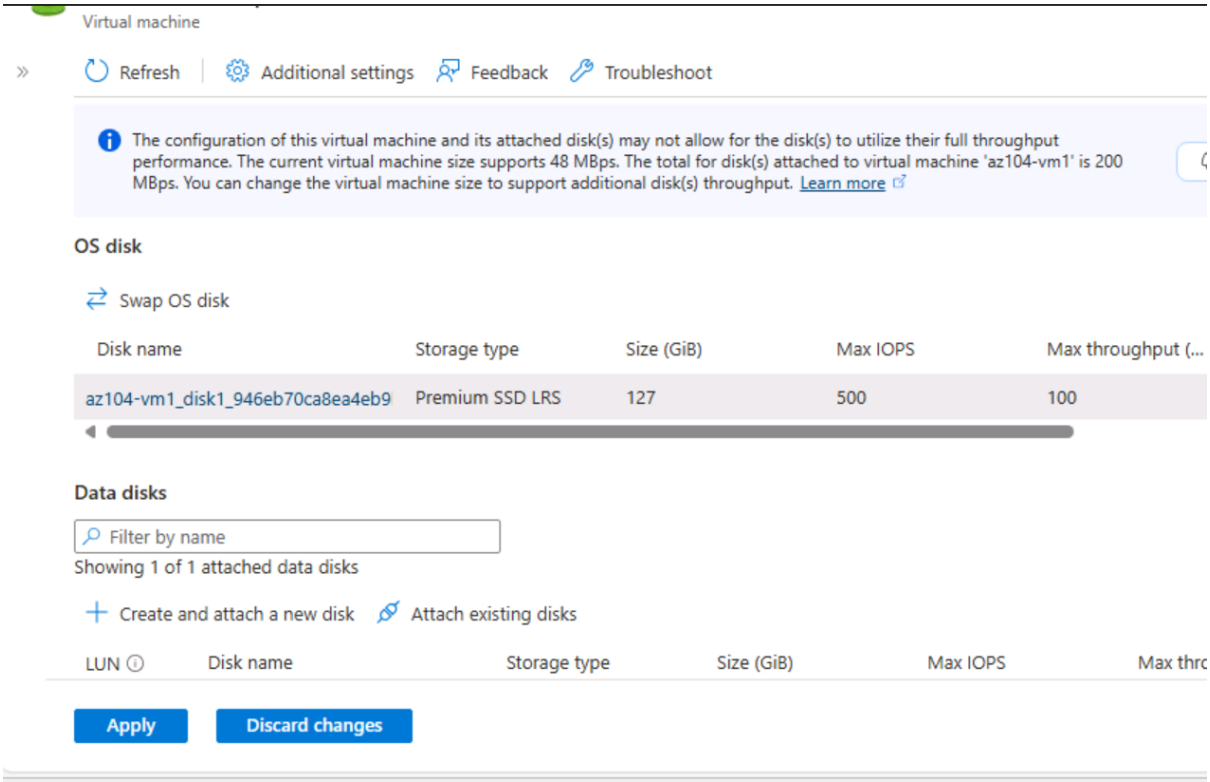
✅ Disk creation screen with Standard HDD



☑ Disk performance blade showing SSD upgrade



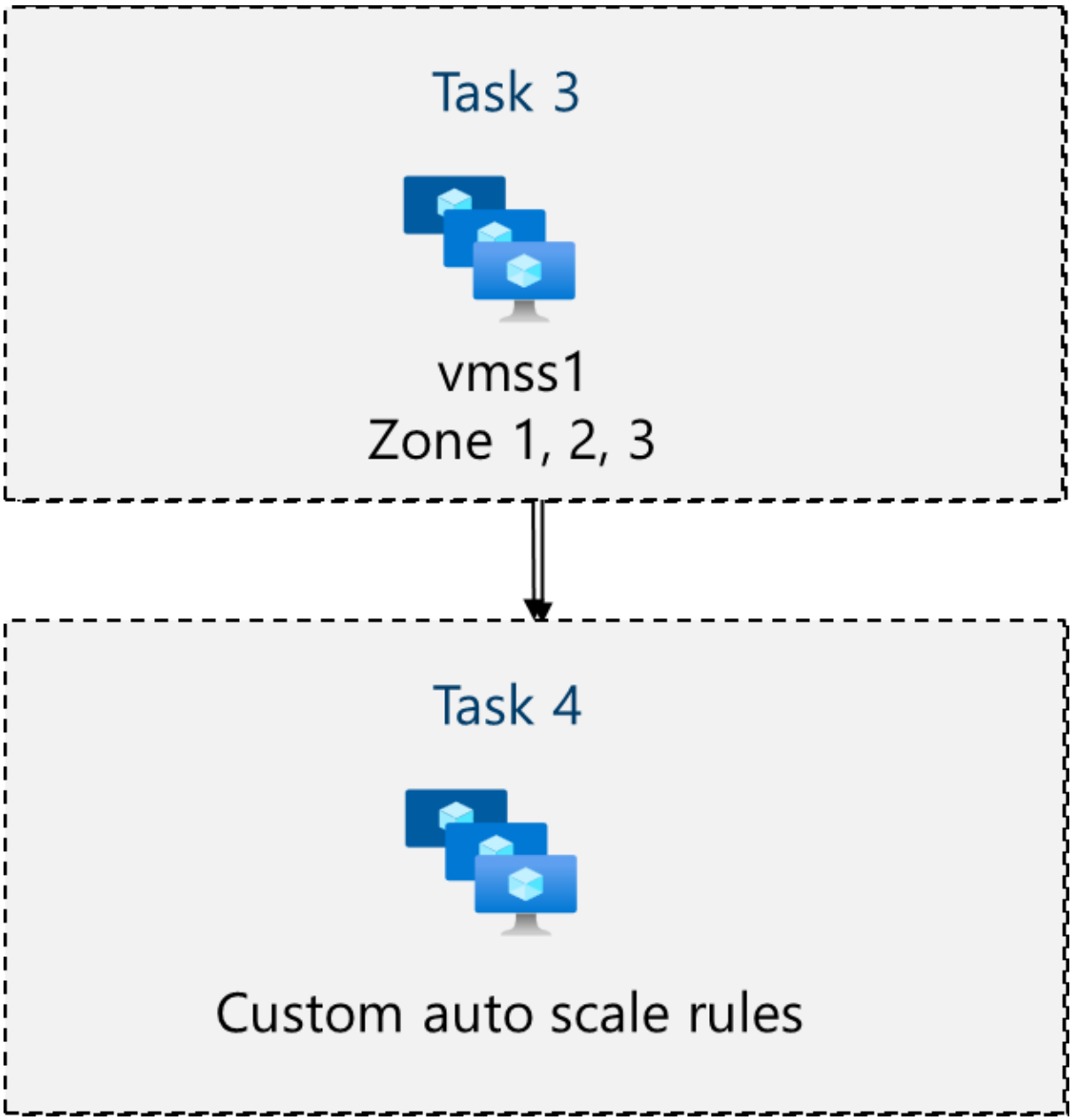
☑ Disk reattachment screen



Notes:

- Resizing VM is vertical scaling — useful for performance tuning
- Disk detachment preserves data for reuse
- SSD upgrade improves IOPS and latency

Task 3: Create and Configure Azure Virtual Machine Scale Sets



Objective:
Deploy a VM Scale Set across multiple availability zones with networking, NSG, and load balancing.

Steps Taken:

1. Navigated to **Virtual Machine Scale Sets > + Create**
2. Configured the following on the Basics tab:

Setting	**Value**
Resource Group	az104-rg8
Scale Set Name	vmss1
Region	East US

Setting	Value
Availability Zones	1, 2, 3
Orchestration Mode	Uniform
Image	Windows Server 2019 Datacenter
Size	Standard D2s_v3
Username	localadmin
Password	[Secure]

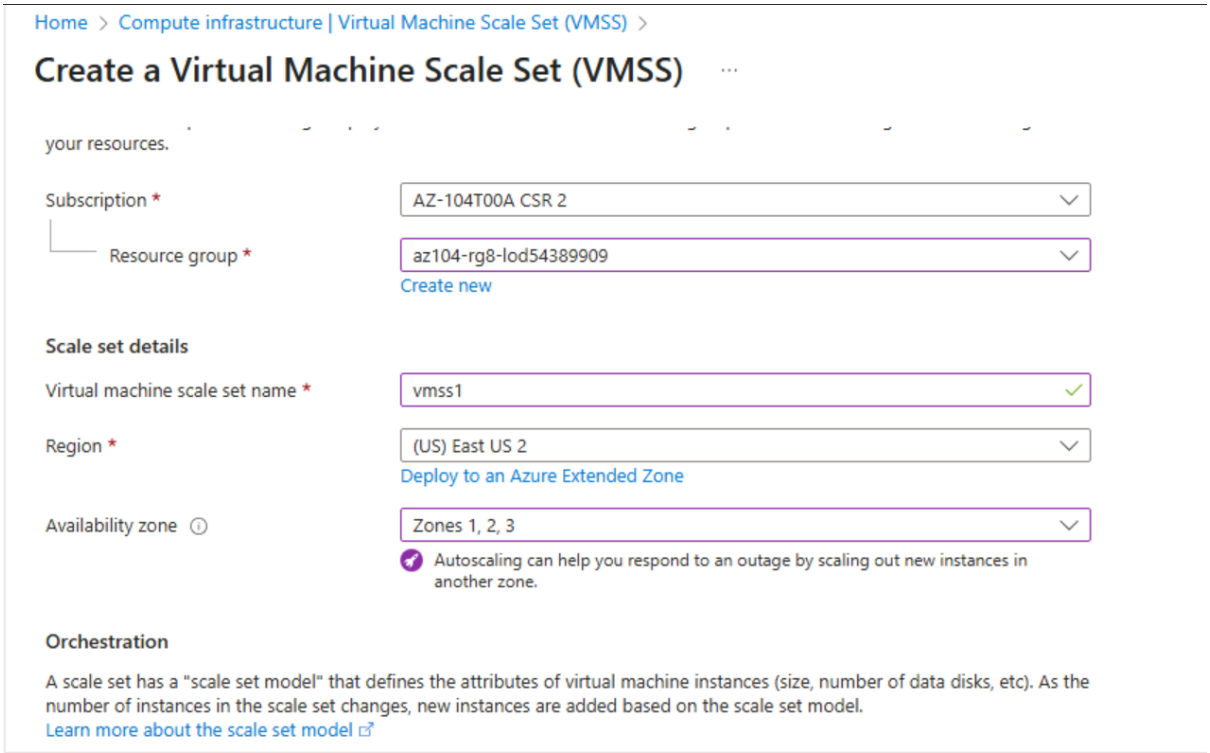
3. Accepted defaults on Spot and Disks tabs
4. Edited virtual network:

Setting	Value
VNet Name	vmss-vnet
Address Range	10.82.0.0/20
Subnet Name	subnet0
Subnet Range	10.82.0.0/24

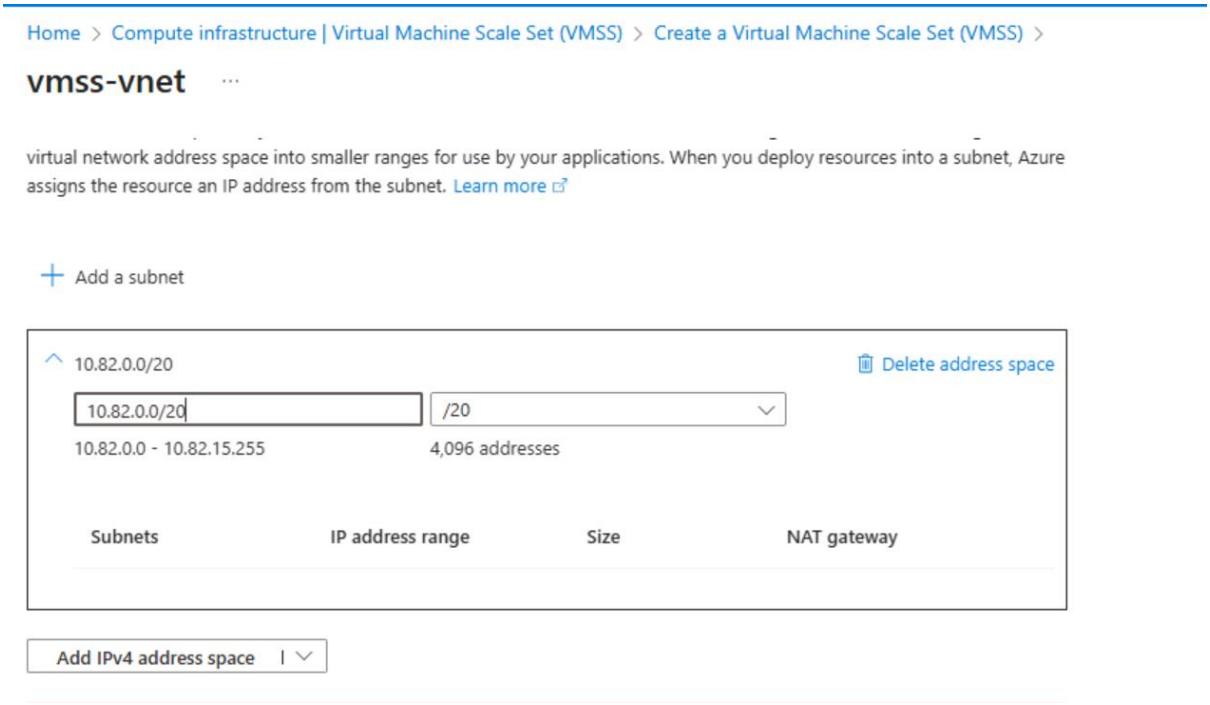
5. Created NSG vmss1-nsg with inbound HTTP rule
6. Enabled Public IP
7. Created Load Balancer vmss-lb
8. Disabled Boot Diagnostics
9. Validated and deployed

Screenshot Checklist:

☑ VMSS creation page with zones selected



☑ VNet and subnet configuration



Add a subnet

Select an address space and configure your subnet. You can customize a default subnet or select from subnet templates if you plan to add select services later. Learn more

Subnet purpose: Default

Name *: subnet0

IPv4

Include an IPv4 address space: ☑

IPv4 address range: 10.82.0.0/20

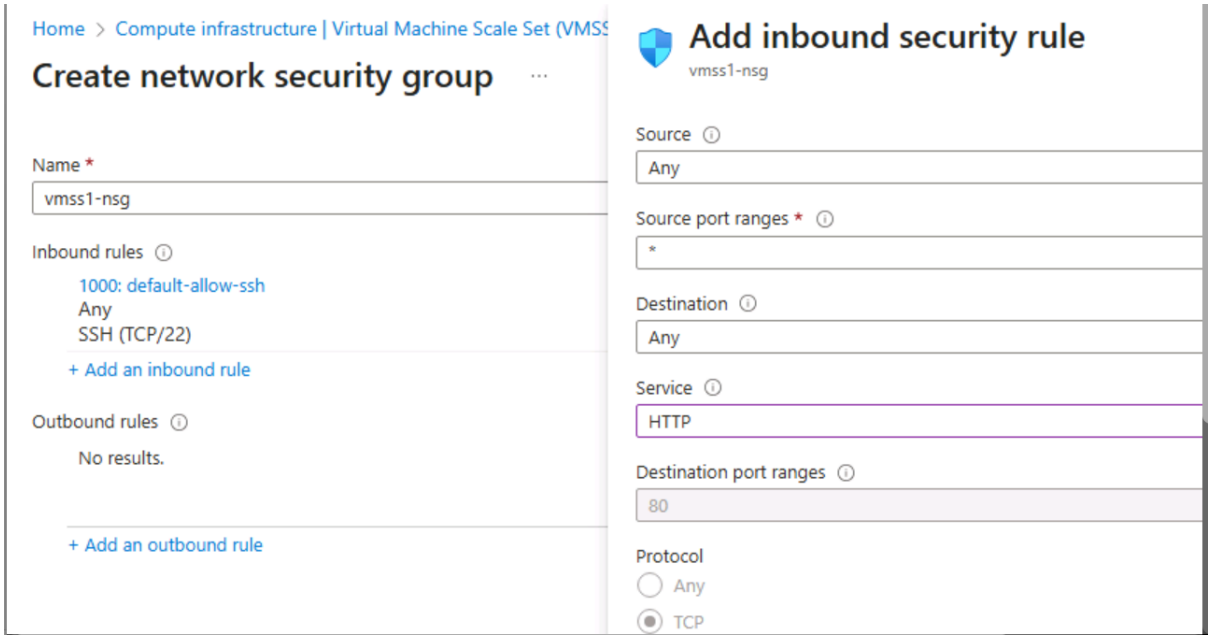
10.82.0.0 - 10.82.15.255

Starting address *: 10.82.0.0

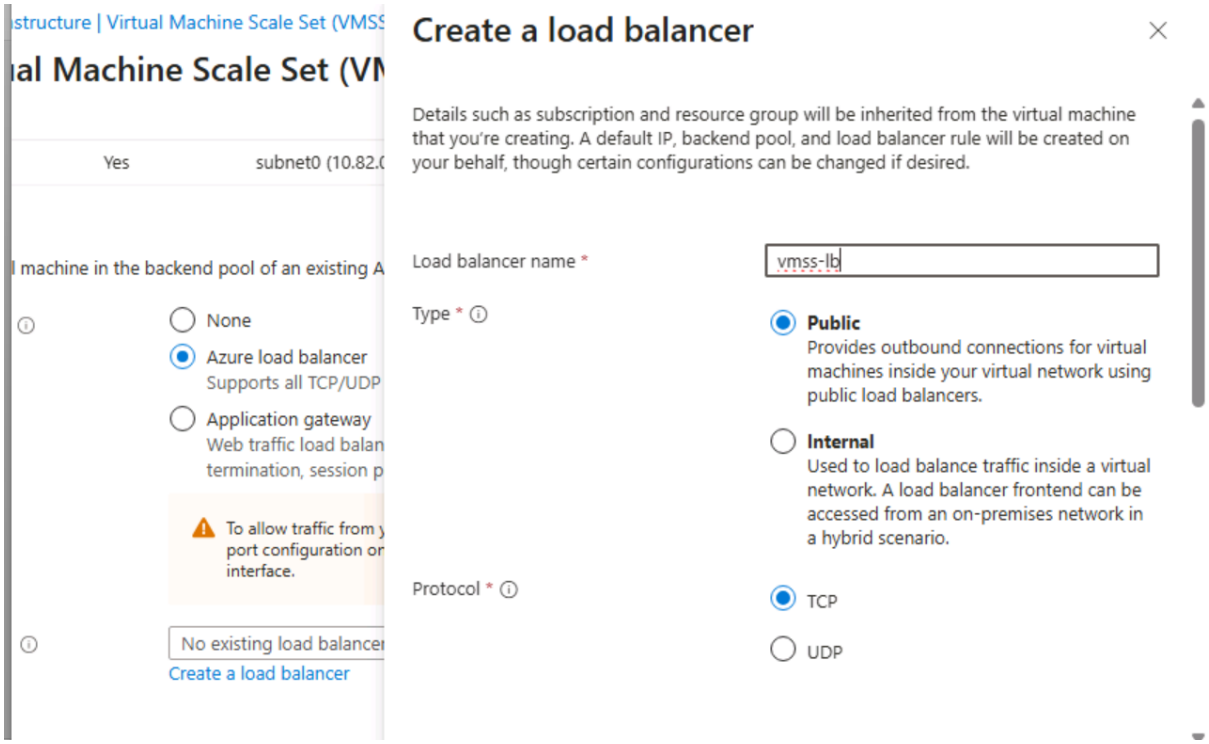
Size: /24 (256 addresses)

Subnet address range: 10.82.0.0 - 10.82.0.255

☑ NSG creation with HTTP rule



☑ Load balancer setup



✅ Final Review + Create screen

✅ Deployment complete confirmation
✅ VMSS resource overview

Notes:

- VMSS simplifies horizontal scaling
- NSG and load balancer setup ensures secure, scalable access

---

🛠️ Task 4: Scale Azure Virtual Machine Scale Sets

Objective:
Configure autoscaling rules based on CPU metrics to scale VM instances dynamically.

Steps Taken:

1. Navigated to vmss1 > Availability + Scale > Scaling
2. Selected **Custom autoscale > Scale based on metric**
3. Created scale-out rule:

Setting	Value
Metric	Percentage CPU
Operator	Greater than

Setting	Value
Threshold	70
Duration	10 min
Operation	Increase by 50%
Cooldown	5 min

4. Created scale-in rule:

Setting	Value
Operator	Less than
Threshold	30
Operation	Decrease by 50%

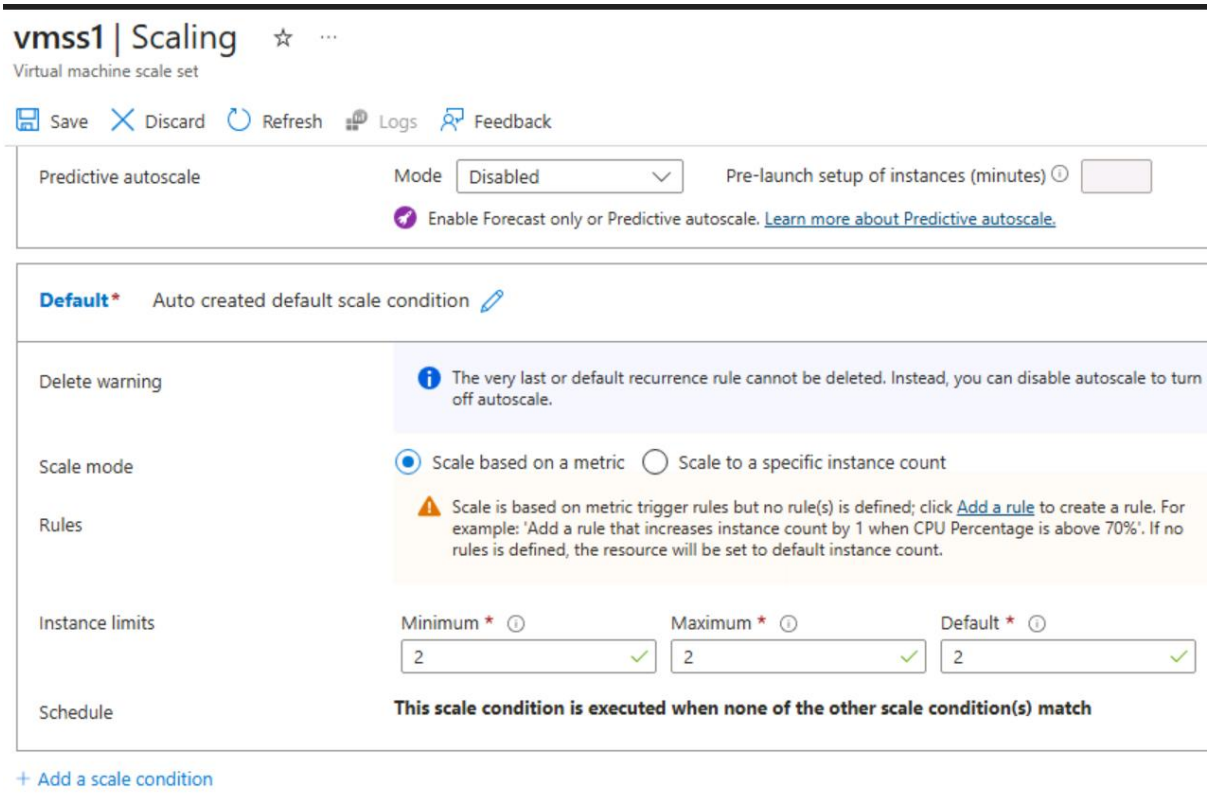
5. Set instance limits:

Setting	Value
Minimum	2
Maximum	10
Default	2

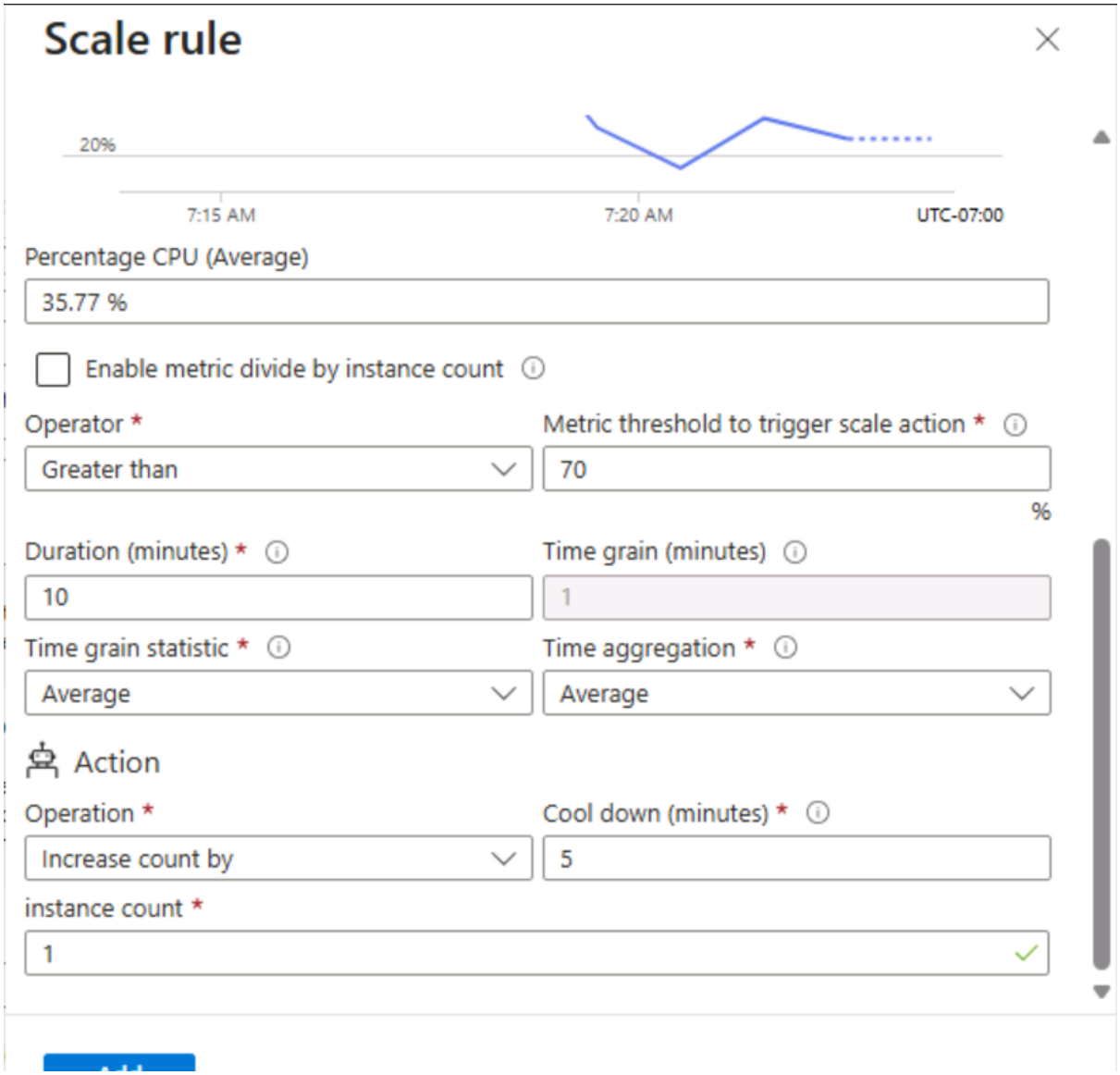
6. Saved all changes
7. Monitored instance count via **Instances** tab

Screenshot Checklist:

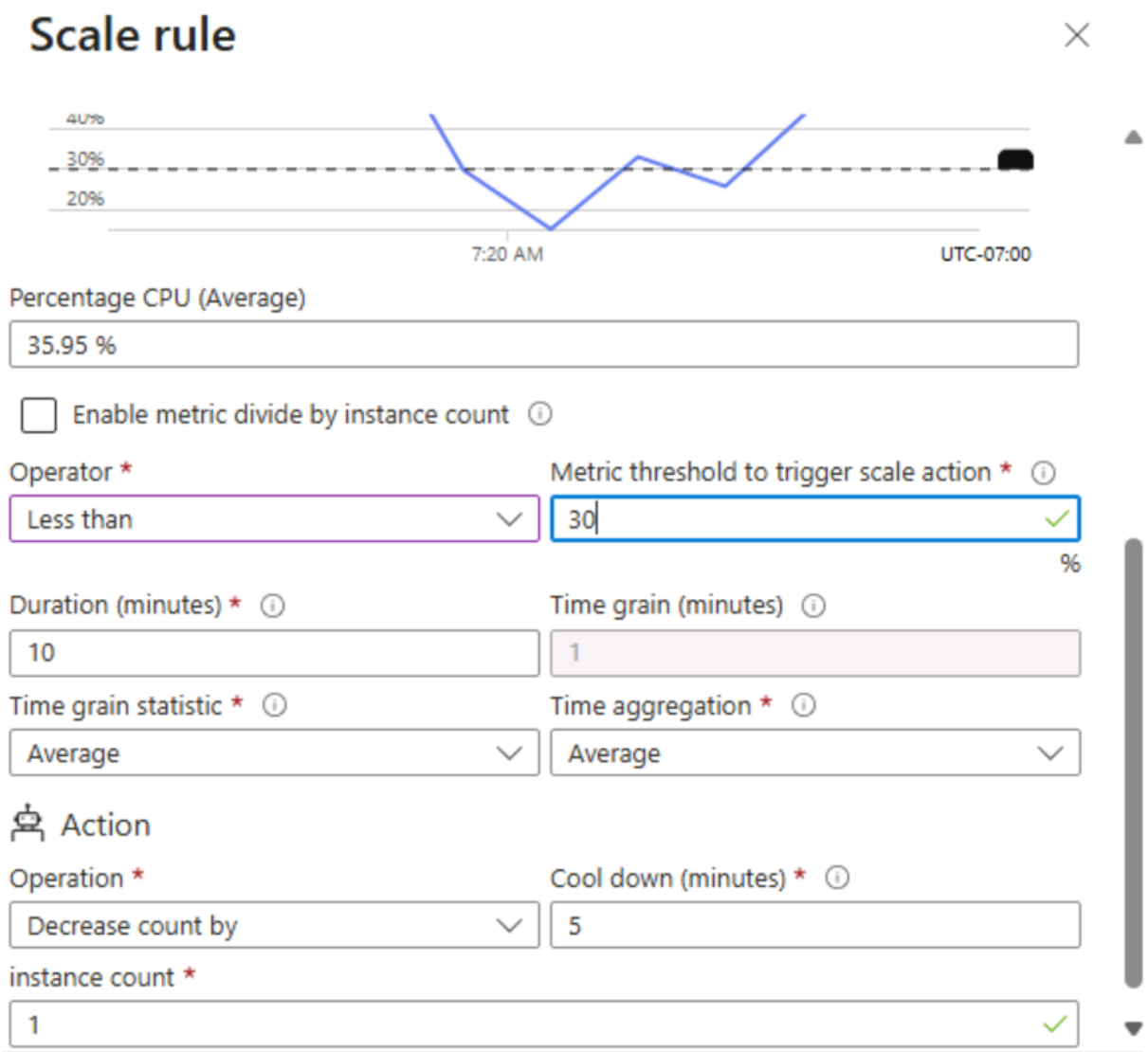
✅ Scaling rules page with CPU metric

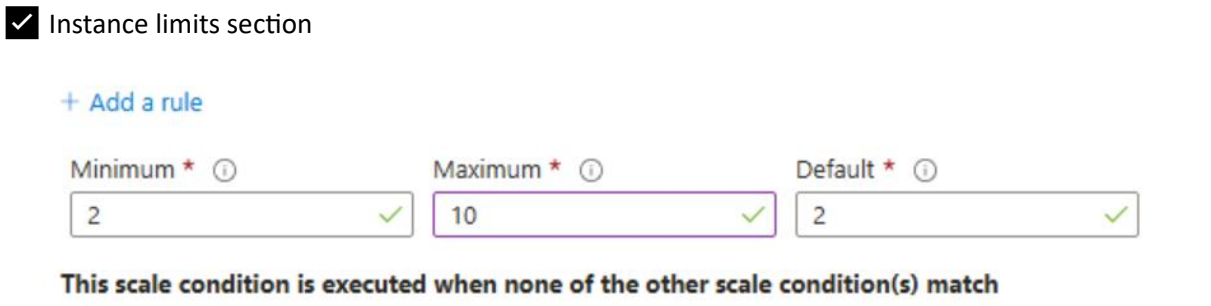


☑ Scale-out rule config



☑ Scale-in rule config





Notes:

- Autoscaling based on CPU ensures cost-efficiency and performance
- Instance limits prevent over-scaling or under-provisioning

Task 5: Create a VM Using Azure PowerShell

Objective:
Deploy and manage a VM using PowerShell in Cloud Shell.

Steps Taken:

1. Launched Cloud Shell and selected PowerShell
2. Ran VM creation command:

```
New-AzVm `
-ResourceGroupName 'az104-rg8' `
-Name 'myPSVM' `
-Location 'East US' `
-Image 'Win2019Datacenter' `
-Zone '1' `
-Size 'Standard_D2s_v3' `
-Credential (Get-Credential)
```

3. Verified VM status:

```
Get-AzVM `
-ResourceGroupName 'az104-rg8' `
-Status
```

4. Deallocated VM:

```
Stop-AzVM `
-ResourceGroupName 'az104-rg8' `
-Name 'myPSVM'
```

5. Verified deallocation:

```
Get-AzVM `
-ResourceGroupName 'az104-rg8' `
-Status
```

Screenshot Checklist:
✅ Cloud Shell with New-AzVM command
✅ VM status showing “Running”
✅ Stop-AzVM confirmation
✅ VM status showing “Deallocated”

Notes:

- PowerShell offers full control over VM lifecycle

- Deallocation stops billing for compute resources

Let me know when you're ready to drop Task 6 — I'll slot it in and then help you wrap the doc with a clean summary and GitHub notes. We can also build a README template that explains your lab structure, screenshot policy, and reuse strategy. This is shaping up to be a killer portfolio piece.

🧩 Task 6: Create a Virtual Machine Using the Azure CLI

Objective:
Deploy and manage a Linux VM using Bash in Azure Cloud Shell.

Steps Taken:

1. Launched Cloud Shell and selected **Bash**
2. Ran VM creation command:

az vm create \ --name myCLIVM \ --resource-group az104-rg8 \ --image Ubuntu2204 \ --admin-username localadmin \ --generate-ssh-keys

1. Verified VM status:

az vm show \ --name myCLIVM \ --resource-group az104-rg8 \ --show-details

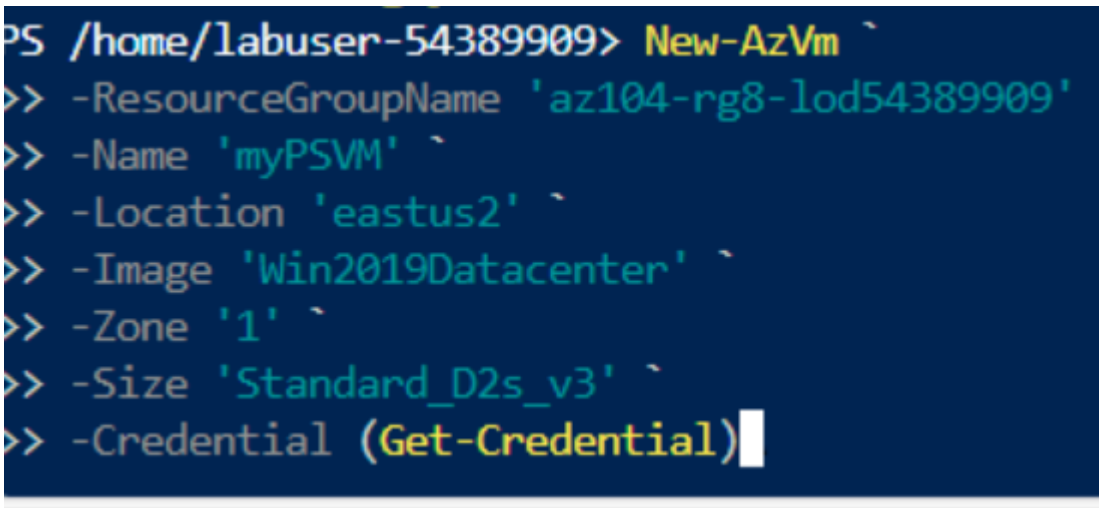
1. Deallocated VM:

az vm deallocate \ --resource-group az104-rg8 \ --name myCLIVM

1. Confirmed deallocation:

az vm show \ --name myCLIVM \ --resource-group az104-rg8 \ --show-details

Screenshot Checklist:
✅ Cloud Shell with az vm create command



✅ VM status showing VM Running

```
ResourceGroupName          Name Location          VmSize  OsType           NIC Provisioning Zone Powe
----------------          ---- --------          ------  ------           --- ------------ ---- -----
az104-rg8-lod54389909 az104-vm1  eastus2 Standard_D2ds_v4 Windows az104-vm1368_z1    Succeeded    1 VM ru
az104-rg8-lod54389909 az104-vm2  eastus2  Standard_D2s_v3 Windows az104-vm1772_z2    Succeeded    2 VM ru
```

```
NIC Provisioning Zone PowerState MaintenanceA
                                      llowed
--- ------------ ---- ---------- ------------
68_z1     Succeeded     1 VM running
72_z2     Succeeded     2 VM running
```

Notes:

- CLI offers fast, scriptable VM deployment
- Deallocation stops billing and releases non-static public IPs
- Ideal for automation and DevOps workflow