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Section: A

LAB: 08

Task 1: Deploy zone-resilient Azure virtual machines by using the Azure portal.

Microsoft Azure

Search resources, services, and docs (G+)

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Home > Compute infrastructure | Virtual machines >

Create a virtual machine

Help me create a low cost VM Help me create a VM optimized for high availability Help me choose the right VM size for my workload

Validation passed

Help me create a low cost VM Help me create a VM optimized for high availability Help me choose the right VM size for my workload

Basics

Subscription	Azure for Students
Resource group	(new) az104-rg8
Region	Central India
Availability options	Availability zone
Zone options	Self-selected zone
Availability zone	1, 2
Security type	Standard
Image	Windows Server 2025 Datacenter - Gen2
VM architecture	x64
Size	Standard D2s v3 (2 vcpus, 8 GiB memory)
Enable Hibernation	No
Username	localadmin

< Previous Next > Create

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Home > CreateVm-MicrosoftWindowsServer.WindowsServer-202-20251222202612 | Overview >

az104-vm1

Virtual machine

Help me copy this VM in any region Manage this VM with Azure CLI

az104-vm1 virtual machine agent status is not ready. Troubleshoot the issue →

Help me copy this VM in any region

Connect Start Restart Stop Hibernate Capture Delete Refresh Scale Open in mobile Feedback

Essentials

Resource group (move)	az104-rg8	Operating system	Windows
Status	Running	Size	Standard D2s v3 (2 vcpus, 8 GiB memory)
Location	Central India (Zone 1)	Primary NIC public IP	4.187.236.250 1 associated public IPs
Subscription (move)	Azure for Students	Virtual network/subnet	az104-vm1-vnet/default
Subscription ID	2abc1374-49a7-48c3-b0a8-366511eba3ea	DNS name	Not configured
Availability zone	1	Health state	-
Tags (edit)	Add tags	Time created	12/22/2025, 3:31 PM UTC

JSON View

Overview

- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Resource visualizer
- Connect
- Networking
- Settings
- Availability + scale
- Security
- Backup + disaster recovery
- Operations

Add or remove favorites by pressing Ctrl+Shift+F

Task 2: Manage compute and storage scaling for virtual machines.

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Home > CreateVm-MicrosoftWindowsServer.WindowsServer-202-2025122202612 | Overview > az104-vm1

az104-vm1 | Size

Virtual machine

Search

Access control (IAM)

Tags

Diagnose and solve problems

Resource visualizer

Connect

Networking

Settings

Availability + scale

Size

Availability + scaling

Security

Backup + disaster recovery

Operations

If the virtual machine is currently running, changing its size will cause it to be restarted. Stopping the virtual machine may reveal additional sizes. →

D2ds_v4

Display cost: Monthly

vCPUs: All

RAM (GiB): All

Add filter

Showing 1 of 457 VM sizes

Subscription: Azure for Students

Region: Central India

Current size: Standard_D2ds_v4

Learn more about VM sizes

Group by series

VM Size ↑

D-Series v4

D2ds_v4

Resize this virtual machine

Do you want to resize to size 'Standard_D2ds_v4'? If the virtual machine is currently running, changing its size will cause it to be restarted.

Resize

Cancel

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

https://portal.azure.com/#view/HubsExtension/DeploymentDetailsBla...

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Home > az104-vm1

az104-vm1 | Disks

Virtual machine

Search

Refresh

Additional settings

Feedback

Troubleshoot

Swap OS disk

Disk name

Storage type

Size (GiB)

Max IOPS

Max throughput (...)

Encryption

az104-vm1_OsDisk_1_0739aa36e91c4e59b

Premium SSD LRS

127

500

100

SSE with PMK

Data disks

Filter by name

Showing 1 of 1 attached data disks

Create and attach a new disk

Attach existing disks

LUN

Disk name

Storage type

Size (GiB)

Max IOPS

Max throughput (...)

Encryption

0

vm1-disk1

Standard HDD (...)

32

500

60

Platform-managed

Apply

Discard changes

https://portal.azure.com/# Ctrl+Shift+F

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Home > az104-vm1

az104-vm1 | Disks

Virtual machine

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Troubleshoot

Swap OS disk

Disk name

Storage type

Size (GiB)

Max IOPS

Max throughput (...)

Encryption

az104-vm1_OsDisk_1_0739aa36e91c4e59b

Premium SSD LRS

127

500

100

SSE with PMK

Data disks

Filter by name

Showing 1 of 1 attached data disks

Create and attach a new disk

Attach existing disks

LUN

Disk name

Storage type

Size (GiB)

Max IOPS

Max throughput (...)

Encryption

0

vm1-disk1

Standard HDD LRS

32

500

60

SSE with PMK

Apply

Discard changes

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Home > az104-vm1

az104-vm1 | Disks

Virtual machine

Search

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OS disk

Swap OS disk

Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...)	Encryption
az104-vm1_OsDisk_1_0739aa36e91c4e59b	Premium SSD LRS	127	500	100	SSE with PMK

Data disks

Filter by name

Showing 0 of 0 attached data disks

Create and attach a new diskAttach existing disks

LUN	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...)	Encryption
No data disks attached						

ApplyDiscard changes

Add or remove favorites by pressing Ctrl+Shift+F

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Home > Storage center | Azure Disks > vm1-disk1

vm1-disk1 | Size + performance

Disk

Search

Diagnose and solve problemsResource visualizerSettings

ConfigurationSize + performanceEncryptionNetworkingDisk ExportPropertiesLocksMonitoringAutomationHelp

Explore ways to boost disk performance

Storage type

Standard SSD (locally-redundant storage)

Why are some options disabled?

Size	Disk tier	Provisioned IOPS	Provisioned thro...	Max Shares	Max burst IOPS	Max burst throughput
4 GiB	E1	500	100	3	600	150
8 GiB	E2	500	100	3	600	150
16 GiB	E3	500	100	3	600	150
32 GiB	E4	500	100	3	600	150
64 GiB	E6	500	100	3	600	150
128 GiB	E10	500	100	3	600	150
256 GiB	E15	500	100	3	600	150
512 GiB	E20	500	100	3	600	150

SaveDiscard

Give feedback

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Home > az104-vm1

az104-vm1 | Disks

Virtual machine

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OS disk

Swap OS disk

Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...)	Encryption
az104-vm1_OsDisk_1_0739aa36e91c4e59b	Premium SSD LRS	127	500	100	SSE with PMK

Data disks

Filter by name

Showing 1 of 1 attached data disks

Create and attach a new diskAttach existing disks

LUN	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...)	Encryption
0	vm1-disk1	Standard SSD LRS	32	500	100	SSE with PMK

ApplyDiscard changes

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Task 3: Create and configure Azure Virtual Machine Scale Sets.

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Home > Compute infrastructure | Virtual Machine Scale Set (VMSS) >

Create a Virtual Machine Scale Set (VMSS) ...

Validation passed

Basics Spot Disks Networking Management Health Advanced Tags Review + create

Basics

Subscription	Azure for Students
Resource group	az104-rg8
Virtual machine scale set name	vmss1
Region	Central India
Orchestration mode	Uniform
Availability zone	1,2
Image	Windows Server 2025 Datacenter - Gen2
Size	Standard D2s v3 (2 vcpus, 8 GiB memory)
Scaling mode	Manually update the capacity
Instance count	2

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Home > Compute infrastructure | Virtual Machine Scale Set (VMSS) > Create a Virtual Machine Scale Set (VMSS) >

vnet-centralindia ...

Define the address space of your virtual network with one or more IPv4 or IPv6 address ranges. Create subnets to segment the virtual network address space into smaller ranges for use by your applications. When you deploy resources into a subnet, Azure assigns the resource an IP address from the subnet. [Learn more](#)

+ Add a subnet

10.82.0.0/20 [Delete address space](#)

10.82.0.0 /20 4,096 addresses

Subnets	IP address range	Size	NAT gateway
subnet0	10.82.0.0 - 10.82.0.255	/24 (256 addresses)	-

Add IPv4 address space

Save **Cancel**

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Home > Network foundation | Network security groups > vmss1-nsg

vmss1-nsg | Inbound security rules ...

Network security group

Search + Add Hide default rules Refresh Delete Give feedback

Activity log Access control (IAM) Tags Diagnose and solve problems Resource visualizer Settings

Inbound security rules

Outbound security rules Network interfaces Subnets Properties Locks Monitoring

Network security group security rules are evaluated by priority using the combination security rule can't have the same priority and direction as an existing rule. You can't delete a rule that is associated with a network interface. [Learn more](#)

Filter by name Port == all Protocol

Priority	Name	Port	Protocol
1000	default-allow-ssh	22	TCP
65000	AllowVnetInBound	Any	Any
65001	AllowAzureLoadBalanc...	Any	Any
65500	DenyAllInBound	Any	Any

Add inbound security rule

Source Any

Source port ranges *

Destination Any

Service HTTP

Destination port ranges 80

Protocol TCP

Add **Cancel** Give feedback

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Home > Compute infrastructure | Virtual Machine Scale Set (VMSS) >

vmss1
Virtual machine scale set

Recommend a size for this scale set

Search

Overview

Activity log

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Networking

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Availability + scale

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Monitoring

Refresh

Start

Restart

Stop

Delete

Reimage

Move

Open in mobile

Feedback

JSON View

Essentials

Resource group (...): az104-rg8

Status: 2 out of 2 succeeded

Subscription: Azure for Students

Location (move): Central India

Subscription ID: 2abc1374-49a7-48c3-b0a8-366511eba3ea

Operating system: Windows

Size: Standard_D2s_v3 (2 instances)

Public IP address: 135.235.255.255

Public IP address (IP...): -

Virtual network/subnet...: vmss-vnet/subnet0

Orchestration mode: Uniform

Time created: 22/12/2025, 4:59:18 pm UTC

Tags (edit): Add tags

Properties

Monitoring

Capabilities

Recommendations (0)

Virtual machine profile

Operating system: Windows

Capacity reservation group: -

Status

Provisioning state: Succeeded

Power state: 2 out of 2 instances running

Task 4: Scale Azure Virtual Machine Scale Sets

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Home > Compute infrastructure | Virtual Machine Scale Set (VMSS) > vmss1

vmss1 | Scaling
Virtual machine scale set

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Enable Forecast only or Predictive autoscale

Default * Auto created default scale condition

Delete warning

Scale mode

Rules

Instance limits

Schedule

Scale rule

Metric source: Current resource (vmss1)

Resource type: Virtual machine scale sets

Resource: vmss1

Criteria

Metric namespace: Virtual Machine Host

Metric name: Percentage CPU

Dimension Name: VMName

Operator: =

Dimension Values: All values

1 minute time grain

80%

60%

40%

20%

Add

This scale condition is executed when...

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Home > vmss1

vmss1 | Scaling
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Default * Auto created default scale condition

Delete warning

Scale mode

Rules

Instance limits

Schedule

Scale out

When: vmss1

(Average) Percentage CPU > 70

Increase percent by 50

Minimum: 2

Maximum: 2

Default: 2

This scale condition is executed when none of the other scale condition(s) match

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Instances

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Scaling

Availability

Size

Add or remove favorites by pressing Ctrl+Shift+F

Default* Auto created default scale condition

Delete warning

The very last or default recurrence rule cannot be deleted. Instead, you can disable autoscale to turn off autoscale.

Scale mode

Scale based on a metric

Rules

Scale out

When vmss1

Minimum 2

Maximum 2

Schedule

This scale condition is executed when none of the other scale condition(s) match

Scale rule

Percentage CPU (Average)

17.01 %

Enable metric divide by instance count

Operator * Less than

Metric threshold to trigger scale action * 30 %

Duration (minutes) * 10

Time grain (minutes) 1

Time grain statistic * Average

Time aggregation * Average

Action

Operation * Decrease percent by

Percentage * 50

Cool down (minutes) *

5

Add

Microsoft Azure

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DEFAULT DIRECTORY (BSSE2280134@szabist.pk)

Home > vmss1

vmss1 | Scaling

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Availability

Size

Add or remove favorites by pressing Ctrl+Shift+F

Default* Auto created default scale condition

Delete warning

The very last or default recurrence rule cannot be deleted. Instead, you can disable autoscale to turn off autoscale.

Scale mode

Scale based on a metric

Rules

Scale out

When vmss1

(Average) Percentage CPU > 70

Increase percent by 50

Scale in

When vmss1

(Average) Percentage CPU < 30

Decrease percent by 50

Instance limits

Minimum 2

Maximum 2

Default 2

Schedule

This scale condition is executed when none of the other scale condition(s) match

Microsoft Azure

Search resources, services, and docs (G+)

Copilot

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DEFAULT DIRECTORY (BSSE2280134@szabist.pk)

Home > vmss1

vmss1 | Scaling

Virtual machine scale set

Search

Save Discard Refresh Logs Feedback

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Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Instances

Resource visualizer

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Availability + scale

Scaling

Availability

Size

Add or remove favorites by pressing Ctrl+Shift+F

Default* Auto created default scale condition

Delete warning

The very last or default recurrence rule cannot be deleted. Instead, you can disable autoscale to turn off autoscale.

Scale mode

Scale based on a metric

Rules

Scale out

When vmss1

(Average) Percentage CPU > 70

Increase percent by 50

Scale in

When vmss1

(Average) Percentage CPU < 30

Decrease percent by 50

Instance limits

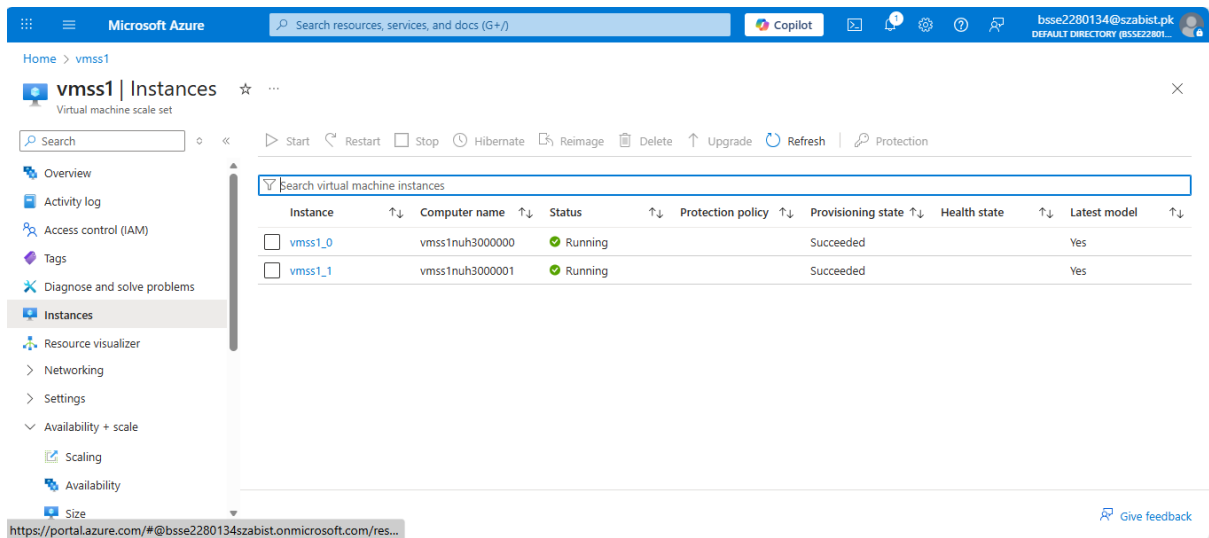
Minimum 2

Maximum 10

Default 2

Schedule

This scale condition is executed when none of the other scale condition(s) match



Task 5: Create a virtual machine using Azure PowerShell (option 1)

```
PS /home/zainab> New-AzVm `
>> -ResourceGroupName 'az104-rg8' `
>> -Name 'myPSVM' `
>> -Location 'Central India' `
>> -Image 'Win2019Datacenter' `
>> -Zone '1' `
>> -Size 'Standard_D2s_v3' `
>> -Credential (Get-Credential)

PowerShell credential request
Enter your credentials.
User: zainab
Password for user zainab: *****

WARNING: Upcoming breaking changes in the cmdlet 'New-AzVm' :
The default VM size will change from 'Standard_D2s_v3' to 'Standard_D2s_v5'.
- This change will take effect on '11/1/2025'
- The change is expected to take effect in Az version : '15.0.0'
- The change is expected to take effect in Az.Compute version : '11.0.0'
Note : Go to https://aka.ms/azps-changewarnings for steps to suppress this breaking change warning, and other information on breaking changes in Azure PowerShell.
You can reference https://aka.ms/findImagePS on how to find VM Images using PowerShell.
```

```
ResourceGroupName      : az104-rg8
Id                    : /subscriptions/2abc1374-49a7-48c3-b0a8-366511eba3ea/resourceGroups/az104-rg8/providers/Microsoft.Compute/virtualMachines/myPSVM
VmId                  : 905b2fe5-b7de-463f-8732-b9d5d6f9924b
Name                  : myPSVM
Type                  : Microsoft.Compute/virtualMachines
Location              : centralindia
Tags                  : {}
HardwareProfile        : {VmSize}
NetworkProfile         : {NetworkInterfaces}
OSProfile              : {ComputerName, AdminUsername, WindowsConfiguration, Secrets, AllowExtensionOperations, RequireGuestProvisionSignal}
ProvisioningState      : Succeeded
StorageProfile         : {ImageReference, OsDisk, DataDisks, AlignRegionalDisksToVMZone}
Zones                  : {1}
FullyQualifiedDomainName : mypsvm-72ba60.Central India.cloudapp.azure.com
TimeCreated            : 12/22/2025 6:28:50 PM
Etag                   : "2"

PS /home/zainab>
```

```
PS /home/zainab> Get-AzVM `
>> -ResourceGroupName 'az104-rg8' `
>> -Status

ResourceGroupName Name Location VmSize OsType NIC Provisioning Zone PowerState MaintenanceAllowed
-----
az104-rg8 myPSVM centralindia Standard_D2s_v3 Windows myPSVM Succeeded 1 VM running

PS /home/zainab>
```

Task 6: Create a virtual machine using the CLI (option 2)

```
sh-5.2$ az vm create \
--name myCLIVM \
--resource-group az104-rg8 \
--image Ubuntu2204 \
--size Standard_B2s \
--admin-username localadmin \
--generate-ssh-keys
The default value of '--size' will be changed to 'Standard_D2s_v5' from 'Standard_DS1_v2' in a future release.
{
  "fqdns": "",
  "id": "/subscriptions/2abc1374-49a7-48c3-b0a8-366511eba3ea/resourceGroups/az104-rg8/providers/Microsoft.Compute/virtualMachines/myCLIVM",
  "location": "centralindia",
  "macAddress": "00-22-48-6E-48-90",
  "powerState": "VM running",
  "privateIpAddress": "192.168.1.5",
  "publicIpAddress": "135.235.153.66",
  "resourceGroup": "az104-rg8"
}
sh-5.2$ az vm show --name myCLIVM --resource-group az104-rg8 --show-details --output table
Name      ResourceGroup  PowerState  PublicIps  Fqdns  Location
-----
myCLIVM   az104-rg8      VM running  135.235.153.66  centralindia
sh-5.2$ az vm deallocate --resource-group az104-rg8 --name myCLIVM
sh-5.2$ az vm show --name myCLIVM --resource-group az104-rg8 --show-details --output table
Name      ResourceGroup  PowerState  PublicIps  Fqdns  Location
-----
myCLIVM   az104-rg8      VM deallocated  135.235.153.66  centralindia
```