

# 1. Objective:

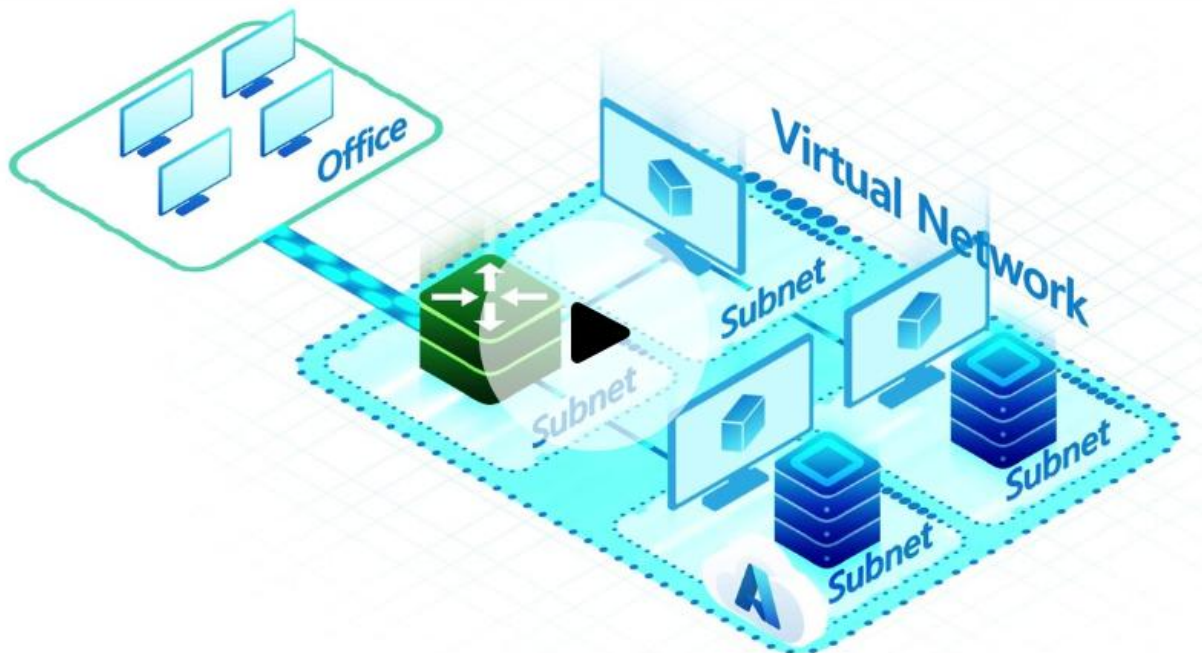
- ✓ Prepare a R&D document on the working of NSG & ASG, allowing specific IPs to access VMs and Deny Internet using NSG, Public IPs and Types, Static and Dynamic IP, Service tags, Allocate Static IPs to all VM's, creating a Network Security Group, Creating Public IP, Associating/De-associating Public IP with virtual machine, Creation of Network Interface

## 2. Introduction

**Microsoft Azure**, or just **Azure** is the cloud computing platform developed by Microsoft.

It has management, access and development of applications and services to individuals, companies, and governments through its global infrastructure.

**Azure Virtual Network** is a service that provides the fundamental building block for your private network in Azure. An instance of the service (a virtual network) enables many types of Azure resources to securely communicate with each other, the internet, and on-premises networks. These Azure resources include virtual machines (VMs).



A **virtual machine** is like a physical computer, but it is a digital version of it. Actually, it is not so much different from physical computers because they have also memory, CPU, as well as they have disks to store our data or various files and one more interesting thing is that they can also connect to the internet.

You can create a virtual network in the cloud dedicated to your Azure account. It is the fundamental building block where you can launch Azure resources.

Azure VNet is the networking layer of Azure VMs.

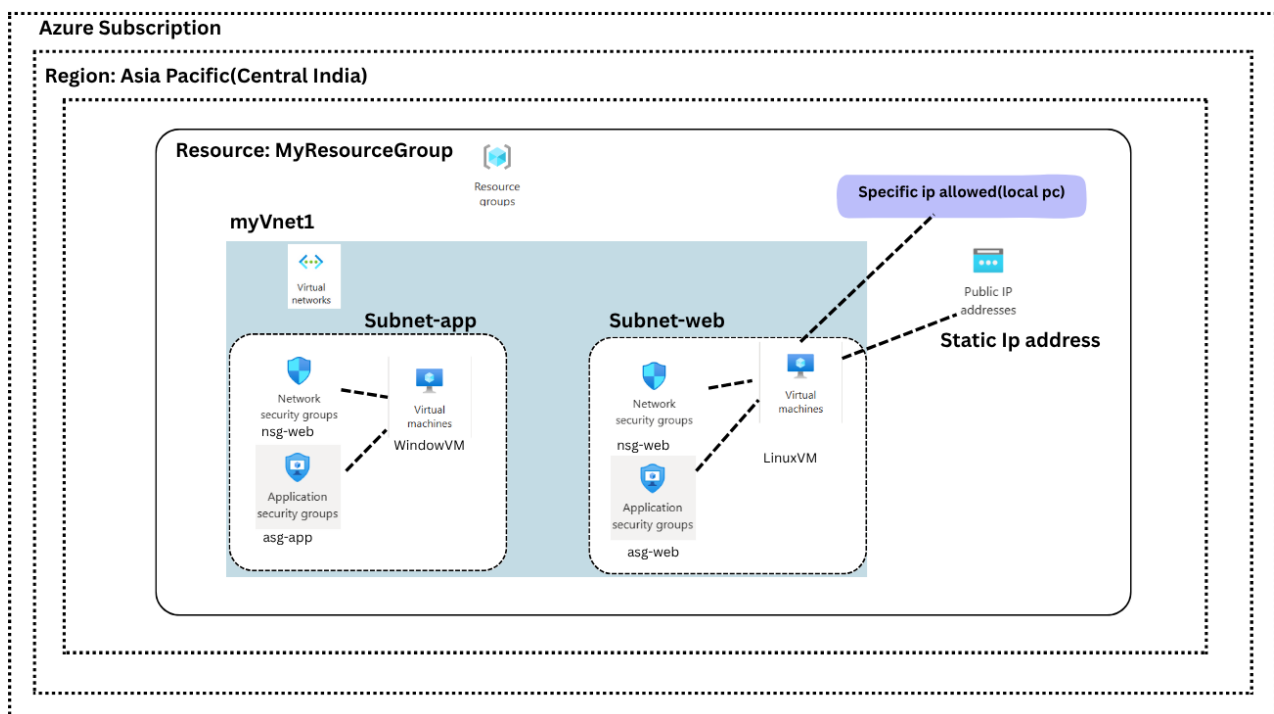
A VNet spans all the Availability Zones in the region. After creating a VNet, you can add one or more subnets in each Availability Zone.

A **virtual network** (VNet) allows you to specify an IP address range for the VNet, add subnets, associate network security groups, and configure route tables.

A **subnet** is a range of IP addresses in your VNet. You can launch Azure resources into a specified subnet. Use a **public subnet** for resources that need to connect to the Internet and a **private subnet** for resources that won't be connected to the Internet.

To protect the Azure resources in each subnet, use **network security groups**.

### 3. Architecture



#### Points to Note:

1. Azure subscription: Azure for Students
2. Azure Region selected: Asia Pacific (Central India)
3. myVnet hosts a Windows VM (WindowVM) in Subnet-app.
- 4. myVnet hosts a Linux VM (LinuxVM) in Subnet-web.
5. Network Security Groups (NSGs) with specific ip, static ip allowed , internet access denied.
6. asg-app and asg-web attached to vms respectively.

## 4. Deployment and Configuration

- i. Login to Azure Account.
- ii. Created a resource group named **MyResourceGroup**.  
Selected region Central India

Home > Resource groups >

### Create a resource group

Basics Tags Review + create

**Resource group** - A container that holds related resources for an Azure solution. The resource group can include all the resources for the solution, or only those resources that you want to manage as a group. You decide how you want to allocate resources to resource groups based on what makes the most sense for your organization. [Learn more](#)

Subscription \* ⓘ Azure for Students

Resource group name \* ⓘ MyResourceGroup

Region \* ⓘ (Asia Pacific) Central India

Previous Next Review + create

- iii. Created 2 Virtual Networks named myVnet in the same region withing same resource group.  
myVnet: Address Space: 10.0.0.0/16  
Subnet: name – default - 10.0.0.0/16  
subnet-web – 10.0.1.0/24  
subnet-app - 10.0.2.0/24

Home > Virtual networks >

### Create virtual network

Basics Security IP addresses Tags Review + create

+ Add a subnet

Subnets	IP address range	Size	NAT gateway
default	10.0.0.0 - 10.0.0.255	/24 (256 addresses)	-
subnet-web	10.0.1.0 - 10.0.1.255	/24 (256 addresses)	-

Add IPv4 address space

#### 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 \* ⓘ subnet-app

**IPv4**

Include an IPv4 address space ☒

IPv4 address range ⓘ 10.0.0.0/16

Starting address \* ⓘ 10.0.2.0

Size ⓘ /24 (256 addresses)

Subnet address range ⓘ 10.0.2.0 - 10.0.2.255

**IPv6**

Include an IPv6 address space ☐ This virtual network has no IPv6 address ranges.

**Private subnet**

Private subnets enhance security by not providing default outbound access. To enable outbound connectivity for virtual machines to access the internet, it is necessary to explicitly grant outbound access. A NAT gateway is the recommended way to provide outbound

Add Cancel [Give feedback](#)

- iv. Create network security group named nsg-web under the same region as resource group.

Home > Network security groups >

## Create network security group

Basics Tags Review + create

**Project details**

Subscription \* Azure for Students

Resource group \* MyResourceGroup  
[Create new](#)

**Instance details**

Name \* nsg-web

Region \* Central India

[Review + create](#) [< Previous](#) [Next : Tags >](#) [Download a template for automation](#)

- v. Go to the nsg-web and go to inbound security rules and make the changes as follows (allowing specific ip address access):

nsg-web | Inbound security rules

Network security group security rules are evaluated by priority or deny the traffic. A security rule can't have the same priority with rules that have a higher priority. [Learn more](#)

Filter by name

Port == all Protocol == all Source == all

Priority	Name	Port
65000	AllowVnetInBound	Any
65001	AllowAzureLoadBalan...	Any
65500	DenyAllInBound	Any

### Add inbound security rule

Source IP Addresses

Source IP addresses/CIDR ranges \* 49.36.51.14

Source port ranges \* \*

Destination Any

Service Custom

Destination port ranges \* 22

Protocol TCP

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

The screenshot shows the Azure portal interface for managing network security groups. On the left, a sidebar lists various management tools like Overview, Activity log, and Settings. The main pane displays 'Inbound security rules' for the 'nsg-web' group, with a table listing existing rules: 'AllowVnetInBound' (priority 65000), 'AllowAzureLoadBalanc...' (priority 65001), and 'DenyAllInBound' (priority 65500). A right-hand pane is open for adding a new inbound rule. The 'Destination port ranges' field is set to '22'. The 'Protocol' is set to 'TCP'. The 'Action' is set to 'Allow'. The 'Priority' is set to '100'. The 'Name' is 'Allow-SSH-From-MyIP' and the 'Description' is 'Allows SSH to Linux VM from my laptop only'. 'Add' and 'Cancel' buttons are at the bottom of the dialog.

**nsg-web | Inbound security rules**

Network security group security rules are evaluated by priority or deny the traffic. A security rule can't have the same priority with rules that have a higher priority. [Learn more](#)

Filter by name

Port == all Protocol == all Source == all

Priority	Name	Port
65000	AllowVnetInBound	Any
65001	AllowAzureLoadBalanc...	Any
65500	DenyAllInBound	Any

**Add inbound security rule**

Destination port ranges: 22

Protocol: ☒ Any ☐ TCP ☐ UDP ☐ ICMPv4 ☐ ICMPv6

Action: ☒ Allow ☐ Deny

Priority: 100

Name: Allow-SSH-From-MyIP

Description: Allows SSH to Linux VM from my laptop only

Add Cancel Give feedback

vi. Go to the outbound rules and deny internet permission:

The screenshot shows the Azure portal interface for managing network security groups. On the left, a sidebar lists various management tools like Overview, Activity log, and Settings. The main pane displays 'Outbound security rules' for the 'nsg-web' group, with a table listing existing rules: 'AllowVnetOutBound' (priority 65000), 'AllowInternetOutBound' (priority 65001), and 'DenyAllOutBound' (priority 65500). A right-hand pane is open for adding a new outbound rule. The 'Source' is set to 'Any'. The 'Source port ranges' is set to '\*'. The 'Destination' is set to 'IP Addresses'. The 'Destination IP addresses/CIDR ranges' is set to '0.0.0.0/0'. The 'Service' is set to 'Custom'. The 'Destination port ranges' is set to '8080'. The 'Protocol' is set to 'Any'. 'Add' and 'Cancel' buttons are at the bottom of the dialog.

**nsg-web | Outbound security rules**

Network security group security rules are evaluated by priority or deny the traffic. A security rule can't have the same priority with rules that have a higher priority. [Learn more](#)

Filter by name

Port == all Protocol == all Source == all

Priority	Name	Port
65000	AllowVnetOutBound	Any
65001	AllowInternetOutBound	Any
65500	DenyAllOutBound	Any

**Add outbound security rule**

Source: Any

Source port ranges: \*

Destination: IP Addresses

Destination IP addresses/CIDR ranges: 0.0.0.0/0

Service: Custom

Destination port ranges: 8080

Protocol: ☒ Any ☐ TCP ☐ UDP ☐ ICMPv4 ☐ ICMPv6

Add Cancel Give feedback

- vii. Create Application Security group named asg-web and asg-app under the same region as resource group.

Home > Application security groups >

## Create an application security group ...

**Basics** Tags Review + create

**Project details**

Subscription \* Azure for Students

Resource group \* MyResourceGroup  
[Create new](#)

**Instance details**

Name \* asg-app

Region \* Central India

[Review + create](#) [< Previous](#) [Next : Tags >](#) [Download a template for automation](#)

- viii. Create linux virtual machine in subnet-web and windows virtual machine in subnet-app with the following configurations.

Home >

## 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](#)

Virtual network \* ⓘ myVnet  
[Create new](#)

Subnet \* ⓘ subnet-web (10.0.1.0/24)  
[Manage subnet configuration](#)

Public IP ⓘ (new) linuxVM-ip  
[Create new](#)

NIC network security group ⓘ  
☒ None  
☐ Basic  
☐ Advanced

 All ports on this virtual machine may be exposed to the public internet. This is a security risk. Use a network security group to limit public access to specific ports. You can also select a subnet that already has network security groups defined or remove the public IP address.

Delete public IP and NIC when VM is deleted ⓘ ☐

Enable accelerated networking ⓘ ☐  
The selected VM size does not support accelerated networking.

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

## 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

Availability zone \* ⓘ

**i** Using an Azure-selected zone is not supported in region 'Central India'.

Zone 1

**✓** 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 \* ⓘ

Ubuntu Server 22.04 LTS - x64 Gen2

[See all images](#) | [Configure VM generation](#)

VM architecture ⓘ

☐ Arm64

☒ x64

Run with Azure Spot discount ⓘ

☐

Size \* ⓘ

Standard\_B1s - 1 vcpu, 1 GiB memory (\$8.18/month) (free services eligible)

[See all sizes](#)

Enable Hibernation ⓘ

☐

**i** Hibernate does not currently support Trusted launch and Confidential virtual machines for Linux images. [Learn more](#)

< Previous

Next : Disks >

Review + create

## 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

### Administrator account

Authentication type ⓘ

☐ SSH public key

☒ Password

Username \* ⓘ

azureuser ✓

Password \*

..... ✓

Confirm password \*

..... ✓

### Inbound port rules

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

Public inbound ports \* ⓘ

☒ None

☐ Allow selected ports

Select inbound ports

Select one or more ports

**i** All traffic from the internet will be blocked by default. You will be able to change inbound port rules in the VM > Networking page.

< Previous

Next : Disks >

Review + create

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

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](#)

### VM disk encryption

Azure disk storage encryption automatically encrypts your data stored on Azure managed disks (OS and data disks) at rest by default when persisting it to the cloud.

Encryption at host ? ☐

*i* Encryption at host is not registered for the selected subscription. [Learn more](#)

### OS disk

OS disk size ?

OS disk type \* ?

The selected VM size supports premium disks. We recommend Premium SSD for high IOPS workloads. Virtual machines with Premium SSD disks qualify for the 99.9% connectivity SLA.

Delete with VM ? ☒

Key management ?

Enable Ultra Disk compatibility ? ☐

< Previous
Next : Networking >
Review + create

## Windows virtual machine:

Home > Compute infrastructure | Virtual machines >

## Create a virtual machine ...

*!* Changing Basic options may reset selections you have made. Review all options prior to creating the 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

Subscription \* ?

Resource group \* ?

[Create new](#)

### Instance details

Virtual machine name \* ?

Region \* ?

Availability options ?

Zone options ?

☒ Self-selected zone  
Choose up to 3 availability zones, one VM per zone

☐ Azure-selected zone (Preview)  
Let Azure assign the best zone for your needs

*i* Using an Azure-selected zone is not supported in region 'Central India'.

Availability zone \* ?


*!* You can now select multiple zones. Selecting multiple zones will create one VM.

< Previous
Next : Disks >
Review + create

[go.microsoft.com/fwlink/?Linkid=2126834](https://go.microsoft.com/fwlink/?Linkid=2126834)



## 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](#)


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](#)

### VM disk encryption

Azure disk storage encryption automatically encrypts your data stored on Azure managed disks (OS and data disks) at rest by default when persisting it to the cloud.

Encryption at host

☐

 Encryption at host is not registered for the selected subscription. [Learn more](#)

### OS disk

OS disk size

Image default (127 GiB)

OS disk type

Standard SSD (locally-redundant storage)

The selected VM size supports premium disks. We recommend Premium SSD for high IOPS workloads. Virtual machines with Premium SSD disks qualify for the 99.9% connectivity SLA.

Delete with VM

☒

Key management


Platform-managed key

< Previous

Next : Networking >

Review + create

## 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](#)

When creating a virtual machine, a network interface will be created for you.

Virtual network

myVnet

[Create new](#)

Subnet

subnet-app (10.0.2.0/24)

[Manage subnet configuration](#)

Public IP

(new) windowsVM-ip

[Create new](#)

NIC network security group

☒

None

☐

Basic

☐

Advanced



All ports on this virtual machine may be exposed to the public internet. This is a security risk. Use a network security group to limit public access to specific ports. You can also select a subnet that already has network security groups defined or remove the public IP address.

Delete public IP and NIC when VM is deleted

☐

Enable accelerated networking

☐

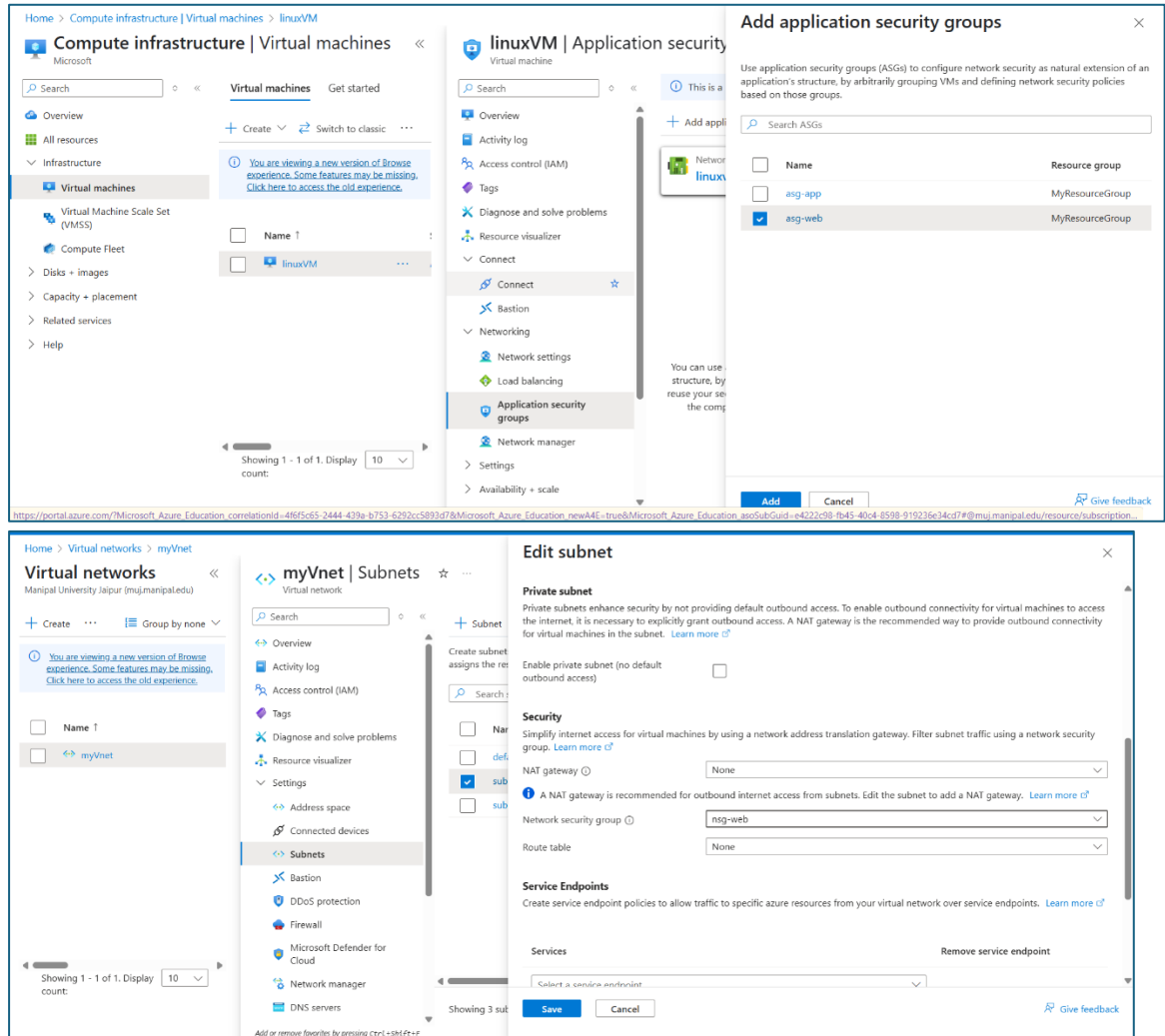
The selected VM size does not support accelerated networking.

< Previous

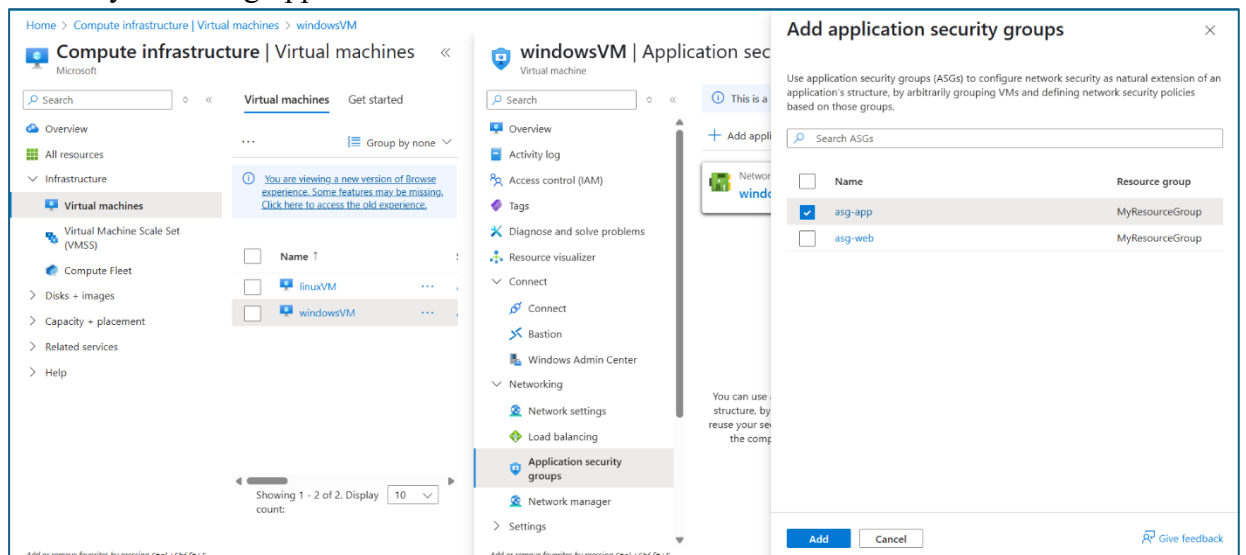
Next : Management >

Review + create

ix. Attach nsg-web to linux vm and asg-web to linux vm.



x. Similarly attach asg-app to windows vm.



xi. Create static ip (10.0.1.4) for linux vm.

Home > Compute infrastructure | Virtual machines >

## Compute infrastructure | Virtual machines

Microsoft

Search

Virtual machines Get started

Overview

All resources

Infrastructure

Virtual machines

Virtual Machine Scale Set (VMSS)

Compute Fleet

Disks + images

Capacity + placement

Related services

Help

You are viewing a new version of Browse experience. Some features may be missing. [Click here to access the old experience.](#)

Group by none

Name ?

linuxVM

windowsVM

Showing 1 - 2 of 2. Display count: 10

linuxVM

Virtual machine

Help me copy this VM in any region

Connect Start Restart Stop Hibernate Capture Delete

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Resource visualizer

Connect

Connect

Bastion

Networking

Network settings

Load balancing

Application security groups

Network manager

Settings

Availability + scale

Extensions + applications

Extensions

Applications

Networking

Public IP address 4.240.88.64 (Network interface linuxvm175\_z1)

Public IP address (IPv6)

Private IP address 10.0.1.4

Private IP address (IPv6)

Virtual network/subnet myVnet/subnet-web

DNS name Configure

Size

<https://portal.azure.com/?Microsoft Azure Education correlationId=46f5c65-2444-439a-b753-6292cc5893d7&Microsoft Azure Education newADE=true&Microsoft Azure Education assSubGuid=e4222c98-ft45-40c4-8598-919236a3dc78#>

Home > Compute infrastructure | Virtual machines > linuxVM > linuxvm175\_z1

## linuxvm175\_z1 | IP configurations

Network interface

Search

Overview

Activity log

Access control (IAM)

Tags

Resource visualizer

Settings

IP configurations

DNS servers

Network security group

Properties

Locks

Monitoring

Automation

Help

IP Settings

Enable IP forwarding

Virtual network myVnet

Gateway load balancer

Subnet subnet-web (10.0.1.0/24) 250 free IP addresses

Private and public IP addresses can be assigned to a virtual machine's network interface controller. You can add as many private and public IPv4 addresses as necessary to a network interface, within the limits listed in the [Azure limits article](#).

+ Add Make primary Delete

Name	IP Version	Type	Private IP Address
ipconfig1	IPv4	Primary	10.0.1.4 (Dynamic)

Apply Discard changes

### Edit IP configuration

linuxvm175\_z1

A primary IP configuration already exists. Any additional IP configurations will be secondary. The virtual network this network interface is attached to only supports IPv4. [Learn more](#)

Name ipconfig1

IP version IPv4

Type Primary

Private IP address settings

Allocation

Dynamic

Static

Private IP address 10.0.1.4

Public IP address settings

Associate public IP address

Public IP address linuxvm-ip (4.240.88.64)

Save Cancel

[Give feedback](#)

Add or remove favorites by pressing Ctrl+Shift+F

xii. Now, create public ip address in the same resource group.

Home > Public IP addresses >

Create public IP address

Basics

DDoS Protection

Tags

Review + create

Create a public IP address. Associate it with a virtual machine or other Azure resources. Internet resources communicate to Azure resources through a public IP address. [Learn more.](#)

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 \* ⓘ

MyResourceGroup

Create new

Instance details

Region \*

(Asia Pacific) Central India

Deploy to an Azure Extended Zone

Previous

Next

Review + create

Home > Public IP addresses >

Create public IP address

Basics

DDoS Protection

Tags

Review + create

IP Version \* ⓘ

☒ IPv4

☐ IPv6

SKU \* ⓘ

☒ Standard

Availability zone \* ⓘ

Zone-redundant

Tier \* ⓘ

☒ Regional

☐ Global

ⓘ The limit for global public IP addresses with the selected IP version in the selected subscription and region has been reached.

IP address assignment

Static IPs are assigned at the time the resource is created and released when the resource is deleted. Dynamic IPs are assigned when associating the IP to a resource and is released when you stop, restart, or delete a resource. Dynamic is only available for Basic SKU. [Learn more](#)

Previous

Next

Review + create

## Create public IP address ...

**Basics**

DDoS Protection

Tags

Review + create

IP address assignment \* ⓘ

☐ Dynamic

☒ Static

Routing preference \* ⓘ

☒ Microsoft network

☐ Internet

ⓘ The limit for public IP addresses with 'Internet' routing preference in the selected subscription and region has been reached.

Idle timeout (minutes) \* ⓘ

4

DNS name label ⓘ

.centralindia.cloudapp.azure.com

Domain name label scope (preview) ⓘ

None

Previous

Next

Review + create

[Home](#) > [Public IP addresses](#) >

## Create public IP address ...

✓ Validation passed

[Basics](#)
[DDoS Protection](#)
[Tags](#)
[Review + create](#)

### Basics

Subscription	Azure for Students
Resource group	MyResourceGroup
Region	centralindia
Name	Static-PIP-VM
IP Version	IPv4
SKU	Standard
Tier	Regional
Availability zone	Zone-redundant
IP address assignment	Static
Routing preference	MicrosoftNetwork
Idle timeout (minutes)	4
DNS name label	-
Domain name label scope (preview)	None

Previous

Next

Create

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xiii. Associate the public ip to linux vm. And dissociate it too.

[Home](#) > [Compute infrastructure](#) | [Virtual machines](#) > [linuxVM](#) > [linuxvm175\\_z1](#)

[linuxvm175\\_z1](#) | IP configurations ☆ ...

[Network interface](#)

Search

[Overview](#)
[Activity log](#)
[Access control \(IAM\)](#)
[Tags](#)
[Resource visualizer](#)
[Settings](#)
[IP configurations](#)
[DNS servers](#)
[Network security group](#)
[Properties](#)
[Locks](#)

[Monitoring](#)
[Automation](#)
[Help](#)

IP Settings

Enable IP forwarding

Virtual network

myVnet

Gateway load balancer

None

Subnet \*

subnet-web (10.0.1.0/24) 250 free IP addresses

Private and public IP addresses can be assigned to a virtual machine's network interface controller. You can add as many private and public IPv4 addresses as necessary to a network interface, within the limits listed in the Azure limits article.

[more](#)

+ Add

⚙ Make primary

🗑 Delete

Name	IP Version	Type	Private IP Address
<input type="checkbox"/> ipconfig1	IPv4	Primary	10.0.1.4 (Static)

Apply

Discard changes

Edit IP configuration

linuxvm175\_z1

secondary: the virtual network this network interface is attached to only supports IPv4. [Learn more](#)

Name \*

ipconfig1

IP version

IPv4

Type

Primary

Private IP address settings

Allocation

Dynamic

Static

Private IP address \*

10.0.1.4

Public IP address settings

Associate public IP address

☒

Public IP address \*

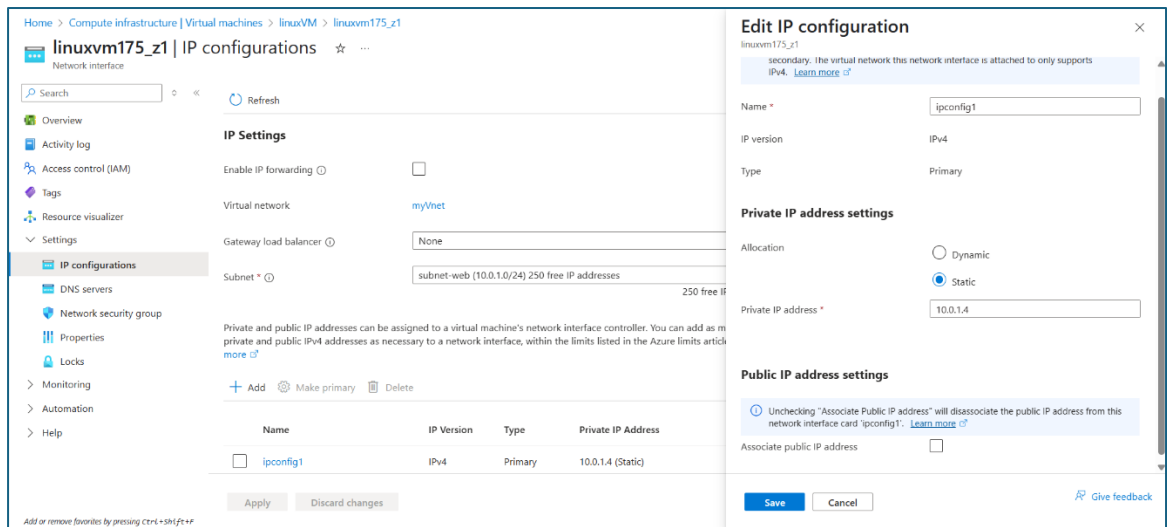
static-pip-vm (98.70.238.186)

[Create a public IP address](#)

Save

Cancel

[Give feedback](#)



xiv. Create network interface card for myVnet in the same region.

Home > Network interfaces >

## Create network interface

**Project details**

Subscription \* Azure for Students

Resource group \* MyResourceGroup [Create new](#)

**Instance details**

Name \* nic-made ✓

Region \* Central India

Virtual network ⓘ myVnet (MyResourceGroup) [Edit virtual network](#)

Subnet \* ⓘ subnet-web [Edit subnet](#) 10.0.1.0 - 10.0.1.255 (256 addresses)

IP version   
☒ IPv4   
☐ IPv4 and IPv6

Private IP address assignment   
☒ Dynamic   
☐ Static

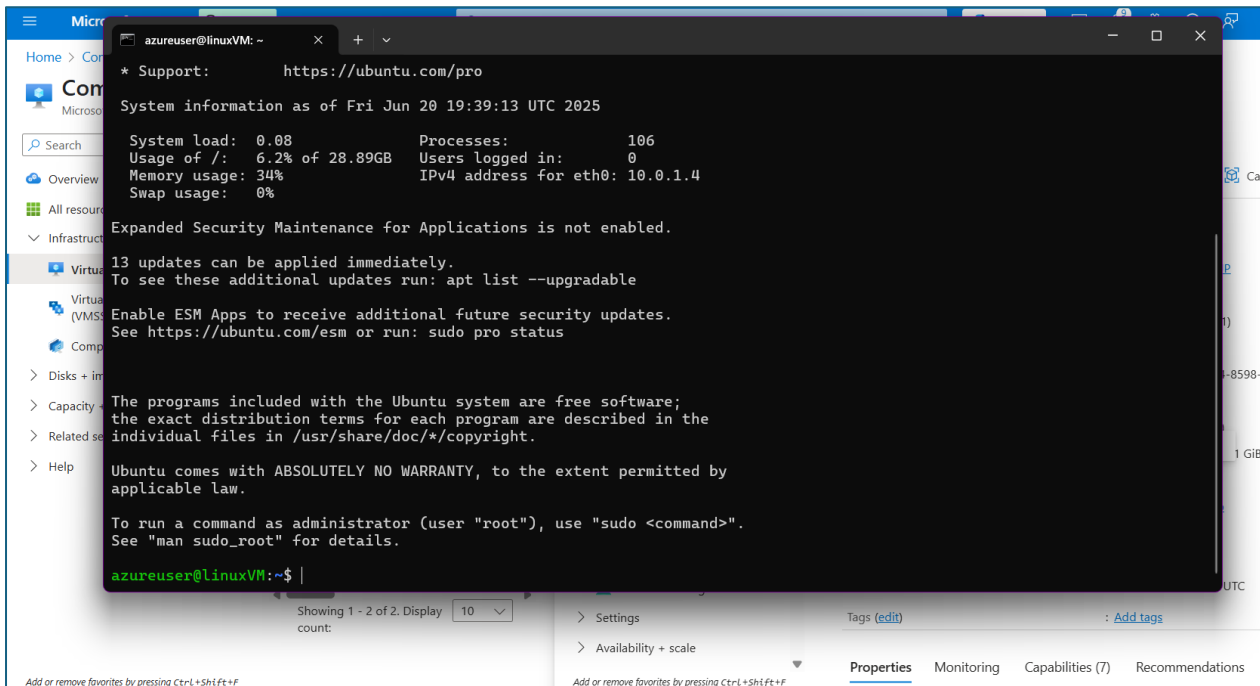
[Review + create](#) [< Previous](#) [Next : Tags >](#) [Download a template for automation](#)

## 5. Result

- ✓ Successfully created network security group and application security group.
- ✓ Successfully attached the nsg and asg to the virtual machines.
- ✓ Successfully allowed inbound rules (specific ip address)
- ✓ Successfully denied outbound rules(internet access)
- ✓ Created static ip and successfully attached to linux vm.

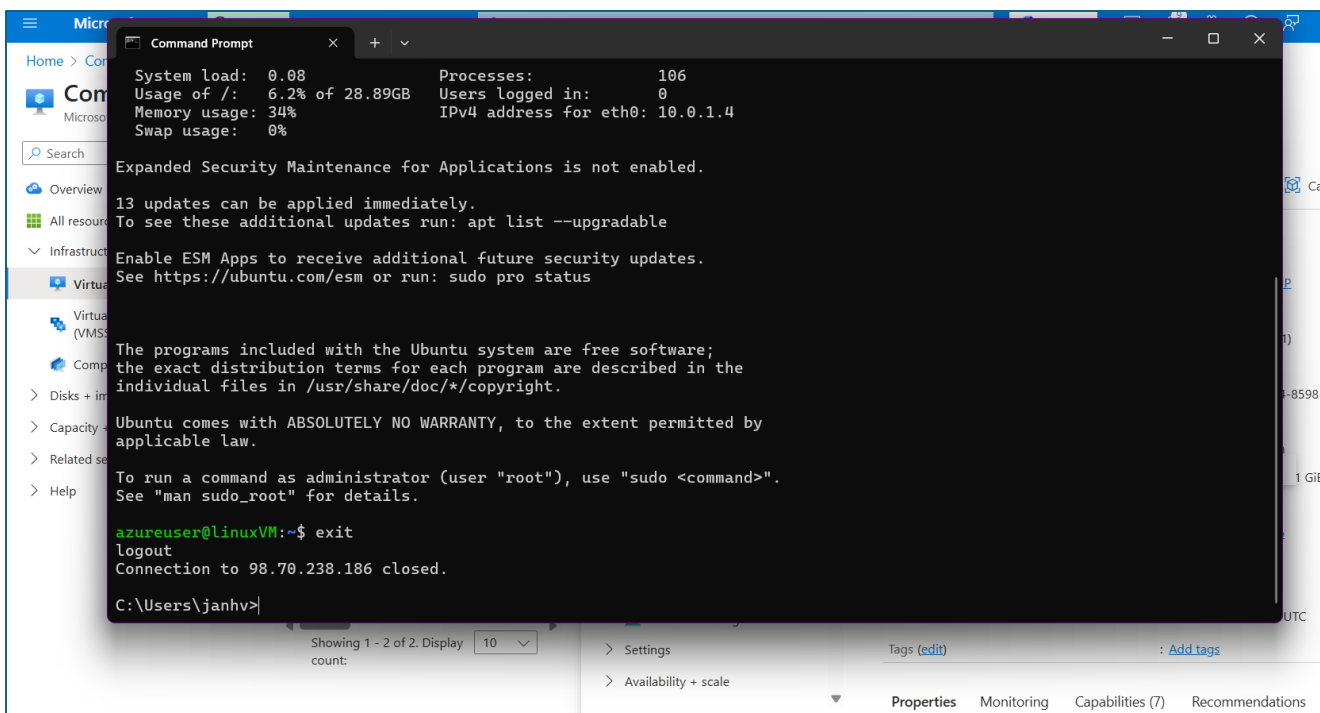
- ✓ Successfully associated and disassociated the ip address accordingly.

Accessed the linux virtual machine by the machine of specific address.



The screenshot shows a terminal window titled "azureuser@linuxVM: ~" with a black background and white text. The terminal displays system information as of Friday, June 20, 2025, at 19:39:13 UTC. The information includes system load (0.08), memory usage (34%), swap usage (0%), processes (106), and users logged in (0). It also shows the IPv4 address for eth0 as 10.0.1.4. A message indicates that Expanded Security Maintenance for Applications is not enabled and that 13 updates can be applied immediately. It suggests running "apt list --upgradable" to see these updates and enabling ESM Apps for additional future security updates. The terminal also displays the Ubuntu license, stating that the programs are free software and that Ubuntu comes with absolutely no warranty. The prompt "azureuser@linuxVM:~\$" is visible at the bottom.

```
azureuser@linuxVM: ~  
* Support: https://ubuntu.com/pro  
System information as of Fri Jun 20 19:39:13 UTC 2025  
System load: 0.08      Processes: 106  
Usage of /: 6.2% of 28.89GB Users logged in: 0  
Memory usage: 34%     IPv4 address for eth0: 10.0.1.4  
Swap usage: 0%  
  
Expanded Security Maintenance for Applications is not enabled.  
13 updates can be applied immediately.  
To see these additional updates run: apt list --upgradable  
Enable ESM Apps to receive additional future security updates.  
See https://ubuntu.com/esm or run: sudo pro status  
  
The programs included with the Ubuntu system are free software;  
the exact distribution terms for each program are described in the  
individual files in /usr/share/doc/*/copyright.  
  
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by  
applicable law.  
  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
azureuser@linuxVM:~$ |
```

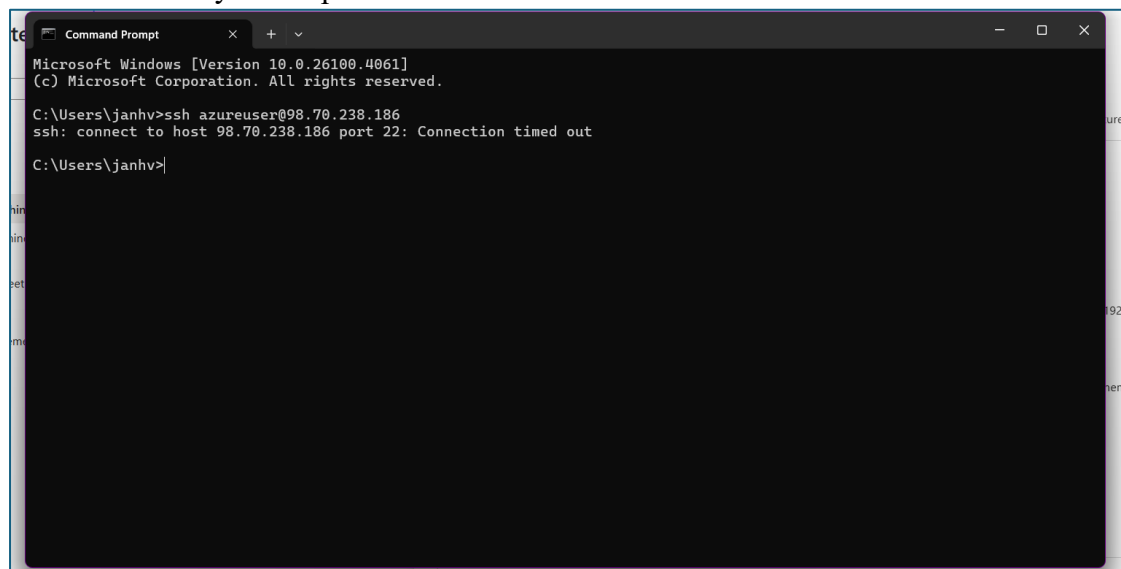


The screenshot shows the same terminal window as the previous one, but now it displays the output of the "exit" command. The prompt "azureuser@linuxVM:~\$" is followed by "exit", which results in "logout" and "Connection to 98.70.238.186 closed.". The terminal window is now titled "Command Prompt" and the prompt is "C:\Users\janhv>".

```
azureuser@linuxVM:~$ exit  
logout  
Connection to 98.70.238.186 closed.  
C:\Users\janhv>
```



## Access denied by other ip address machine

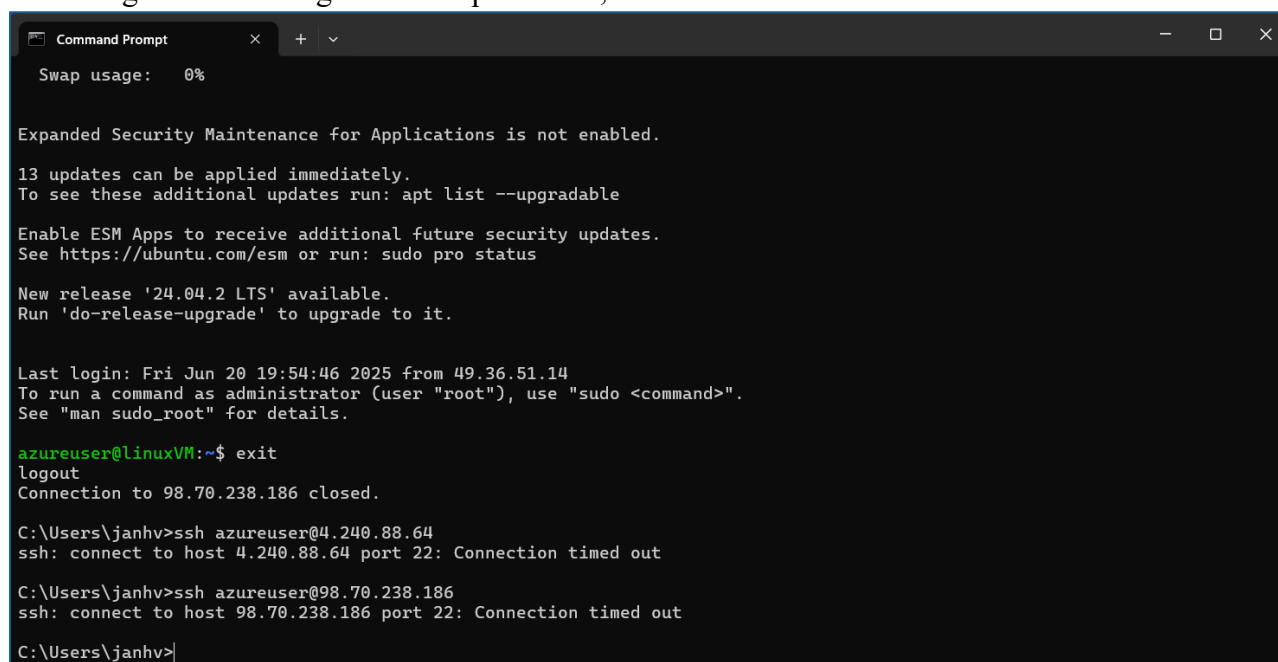


```
Microsoft Windows [Version 10.0.26100.4061]
(c) Microsoft Corporation. All rights reserved.

C:\Users\janhv>ssh azureuser@98.70.238.186
ssh: connect to host 98.70.238.186 port 22: Connection timed out

C:\Users\janhv>
```

## Accessing machine using the static ip address , denied access after dissociation.



```
Command Prompt
Swap usage: 0%

Expanded Security Maintenance for Applications is not enabled.
13 updates can be applied immediately.
To see these additional updates run: apt list --upgradable
Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

New release '24.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Fri Jun 20 19:54:46 2025 from 49.36.51.14
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

azureuser@linuxVM:~$ exit
logout
Connection to 98.70.238.186 closed.

C:\Users\janhv>ssh azureuser@4.240.88.64
ssh: connect to host 4.240.88.64 port 22: Connection timed out

C:\Users\janhv>ssh azureuser@98.70.238.186
ssh: connect to host 98.70.238.186 port 22: Connection timed out

C:\Users\janhv>
```

## 6. Troubleshooting

**Issue 1:** When VM is being created, it is not visible. Solution: The VM and the chosen Virtual Network (VNet) are located in different regions.

Make sure the VM and VNet are in the same region when they are created by going to VNet → Overview then Region.

**Issue 2:** 'None' is shown for the public IP Solution: "None" appears if no public IP was assigned when the virtual machine was created.

To fix, navigate to VM → Networking → Click NIC → IP Configurations → Associate Public IP.

**Issue 3:** SSH/Ping Not Working Solution: By default, NSG blocks SSH and ICMP (ping).

Depending on the use case, add rules to NSG → Inbound Rules to permit either TCP or ICMP on port 22/3389.

**Issue 4:** ASG Doesn't Show Up When Creating a VM Solution: If ASG was created after the VM tab loaded or is located in a different region, it is not visible.

Make sure the ASG and the VM are in the same region, or manually attach the ASG using the NIC settings after the VM has been created.

**Issue 5:** Internet Access Remains Functional Following the Deny Rule Solution: The priority of the Outbound Deny rule is too low.

Make sure the priority is less than 65000 and that it is correctly connected to the subnet or NIC by going to NSG → Outbound Rules.

**Issue 6:** NSG Regulations Not Applying Solution: No association with NSG.

Make sure the NSG is truly connected by going to VNet → Subnets or NIC → NSG.

To debug the final rule set, use the NIC's "Effective Security Rules" feature.

## 7. References:

- <https://learn.microsoft.com/en-us/azure/virtual-network/virtual-networks-overview>
- <https://learn.microsoft.com/en-us/azure/virtual-network/network-security-group-how-it-works>
- <https://learn.microsoft.com/en-us/azure/virtual-network/application-security-groups>
- <https://www.cloudthat.com/resources/blog/difference-between-application-security-groups-asgs-and-network-security-groups-nsgs>
- <https://tutorialsdojo.com/network-security-group-nsg-vs-application-security-group/>
- <https://www.geeksforgeeks.org/computer-networks/difference-between-static-and-dynamic-ip-address/>