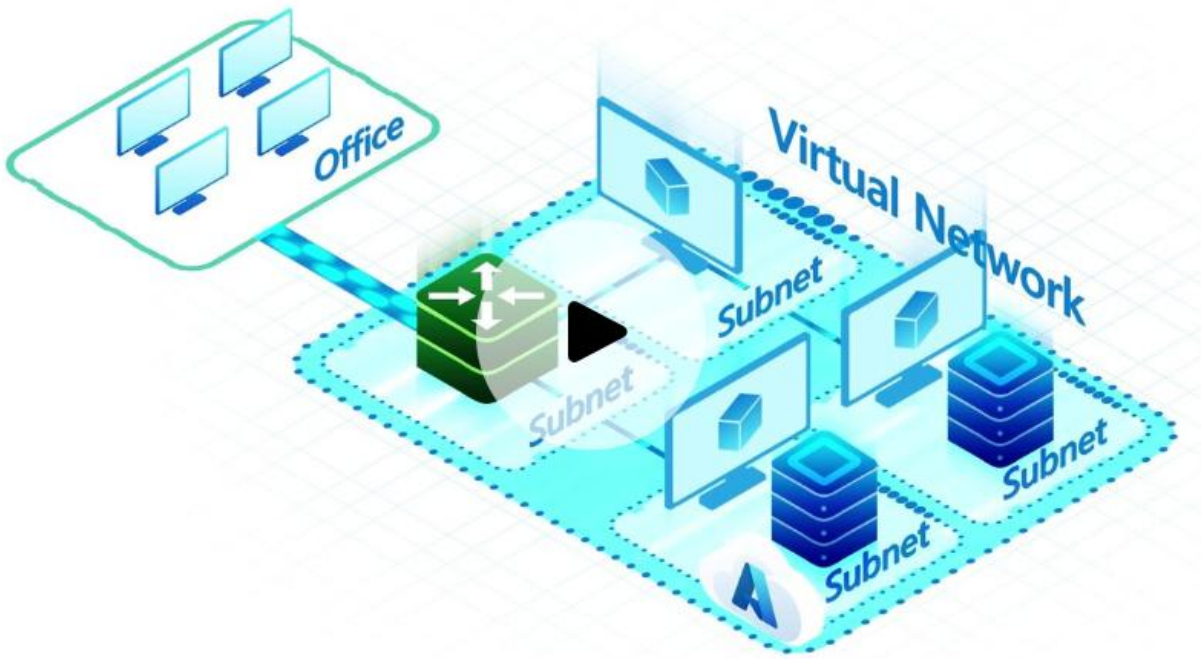
1. **Objective**:

- ✓ Explore VNet, Subnet, Vnet Peering and it's Types. Do r&d on Azure Virtual Network.
- ✓ Create a VNET and Its Subnets and launch a Windows Linux VM in each subnet, VM should be able to ping each other. Create two Vnets and create a connection between them using Vnet peering.

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 actually 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.

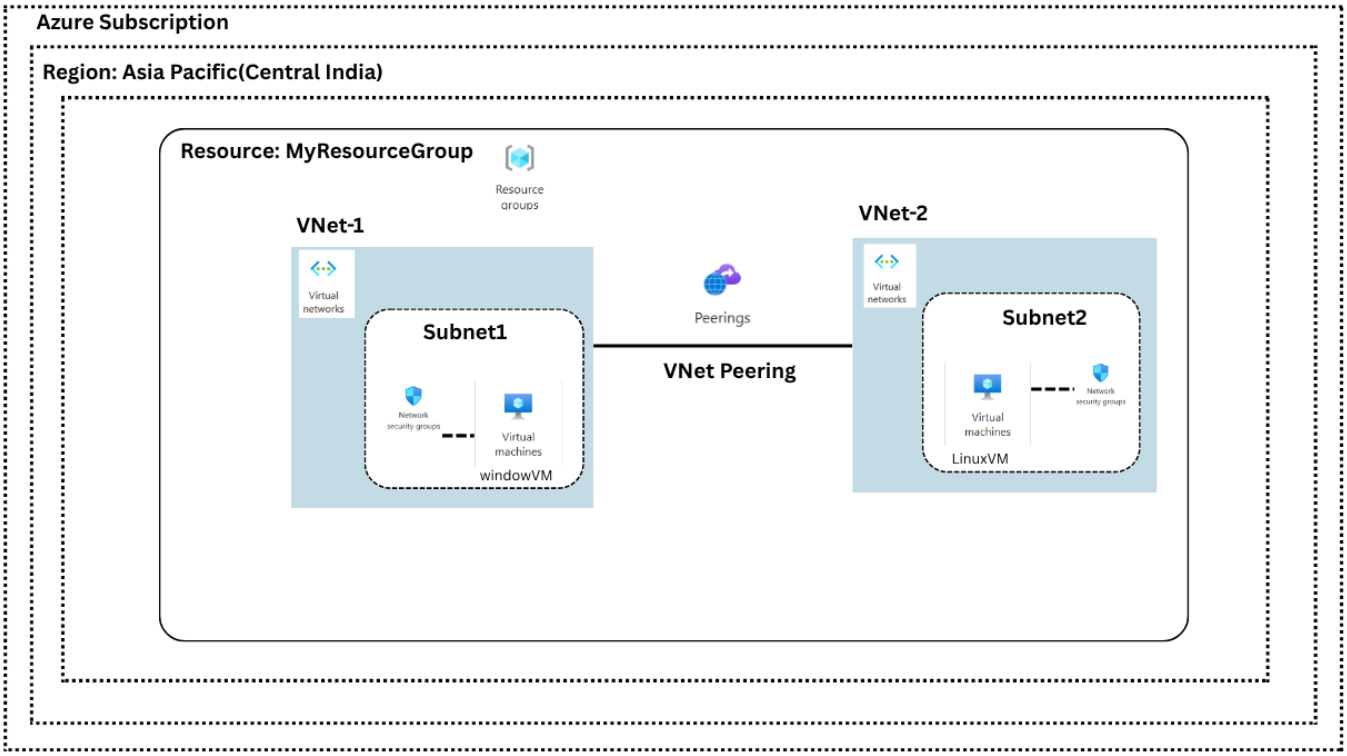
You can create a virtual network in the cloud dedicated to your Azure account. It is the fundamental building block where you can launch Azure resources.
Azure VNet is the networking layer of Azure VMs.
A VNet spans all the Availability Zones in the region. After creating a VNet, you can add one or more 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. VNet1 hosts a Windows VM (WindowVM) in Subnet1.

- 4. VNet2hosts a Linux VM (LinuxVM) in Subnet2.

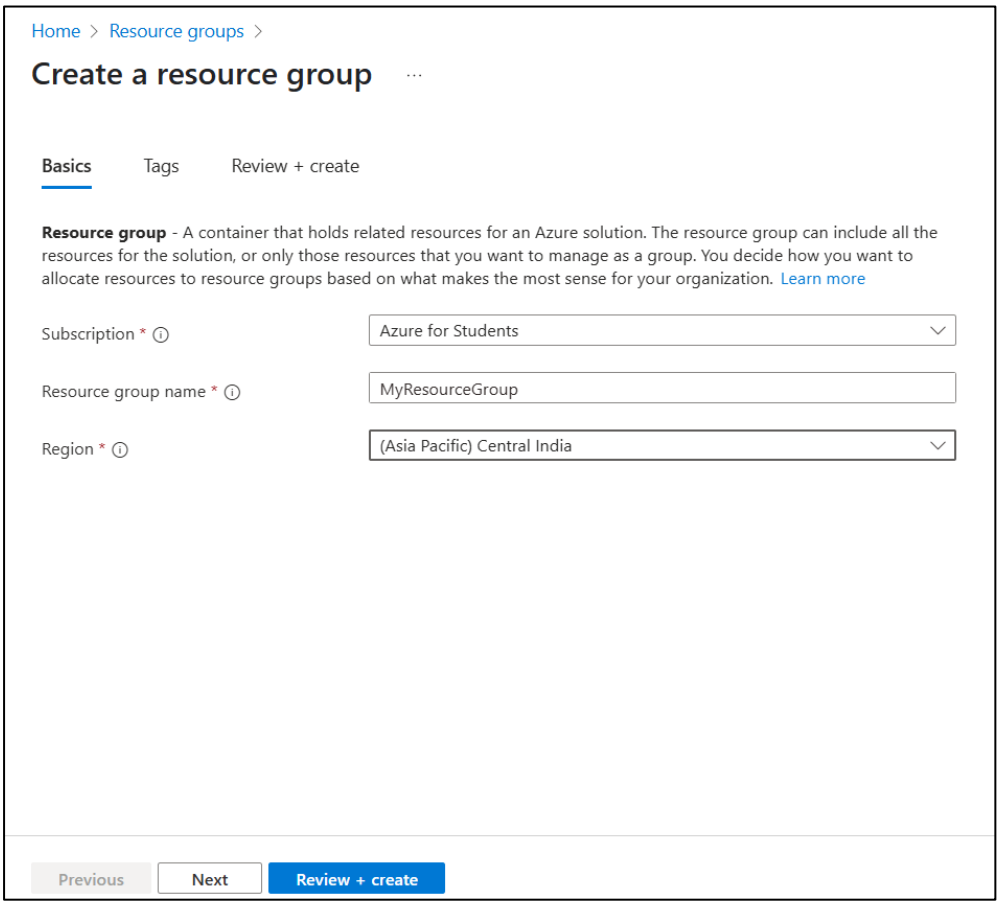
5. Network Security Groups (NSGs) with ICMP, RDP, and SSH allowed

6. VNet Peering has been configured between VNet1 and VNet2.

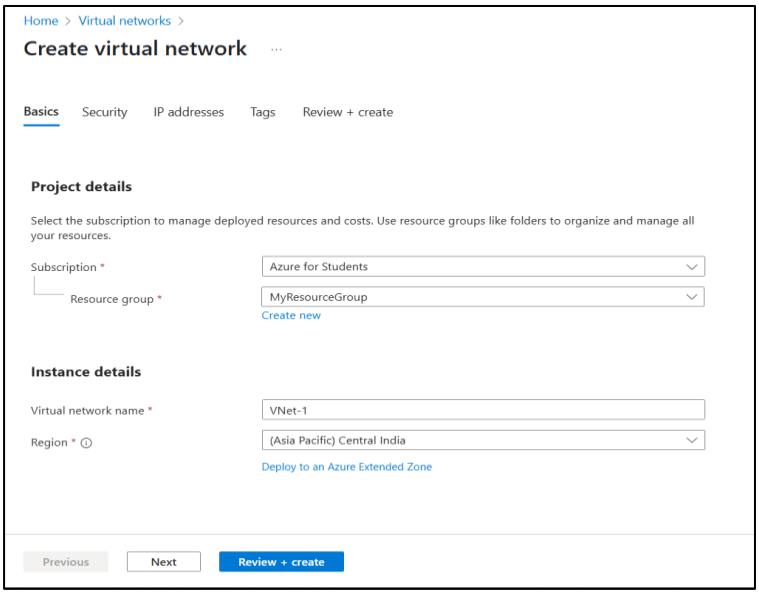
4. Deployment and Configuration

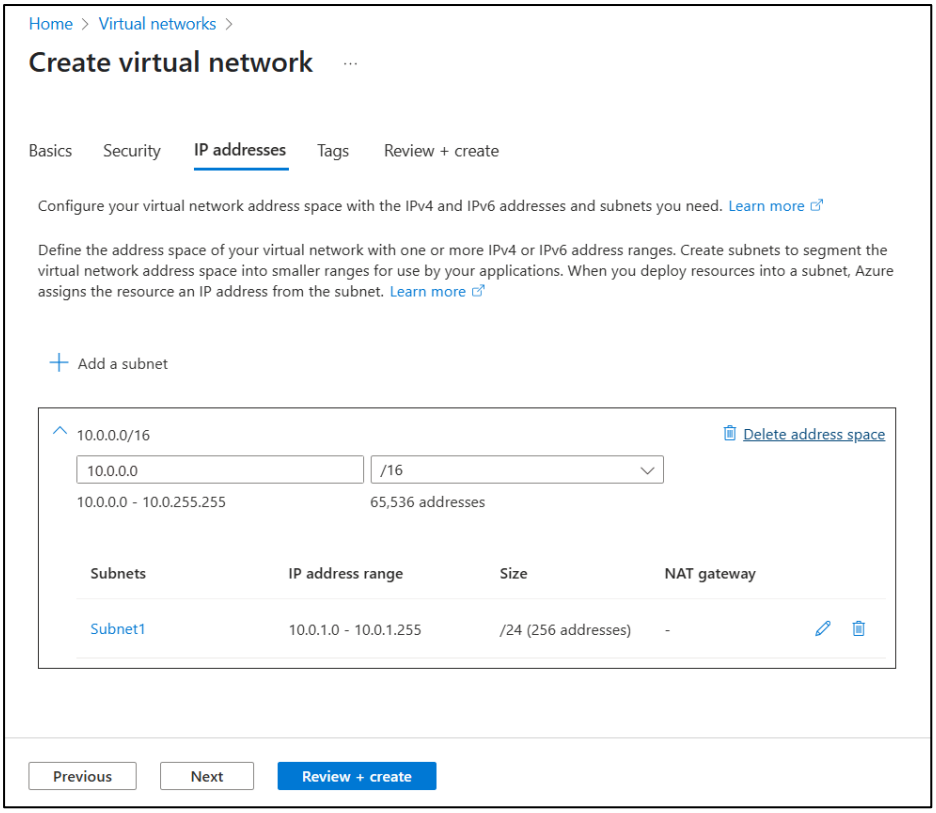
i. Login to Azure Account.

ii. Created a resource group named **MyResourceGroup**.
Selected region Central India

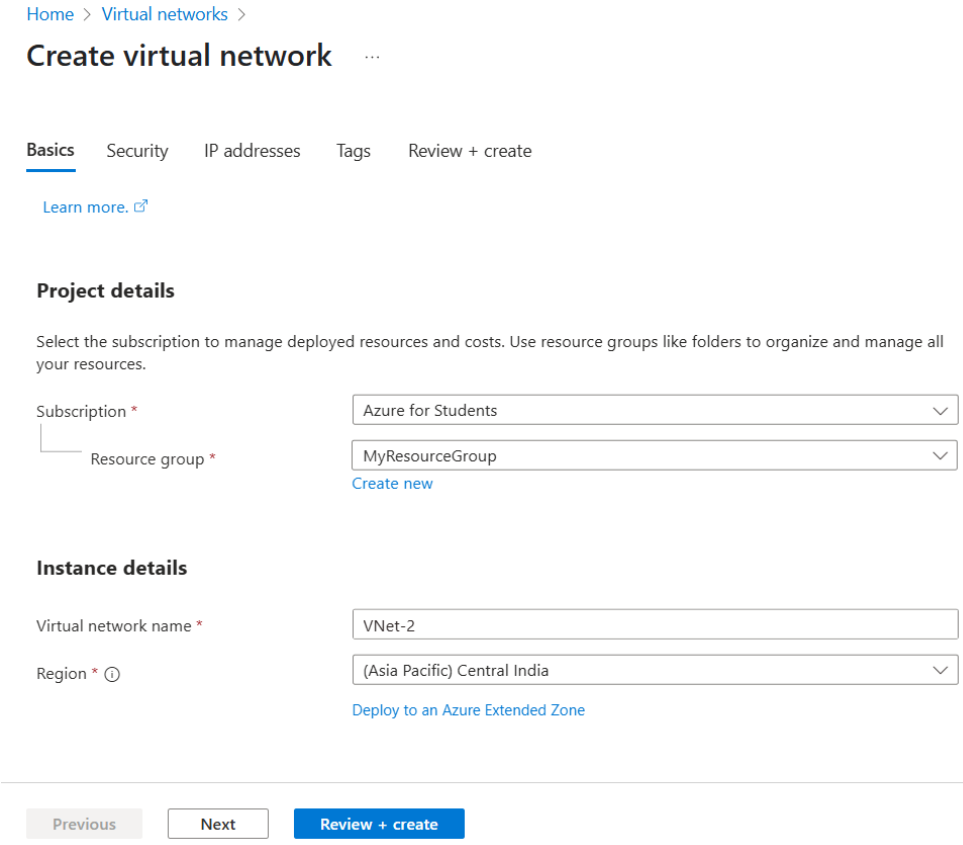


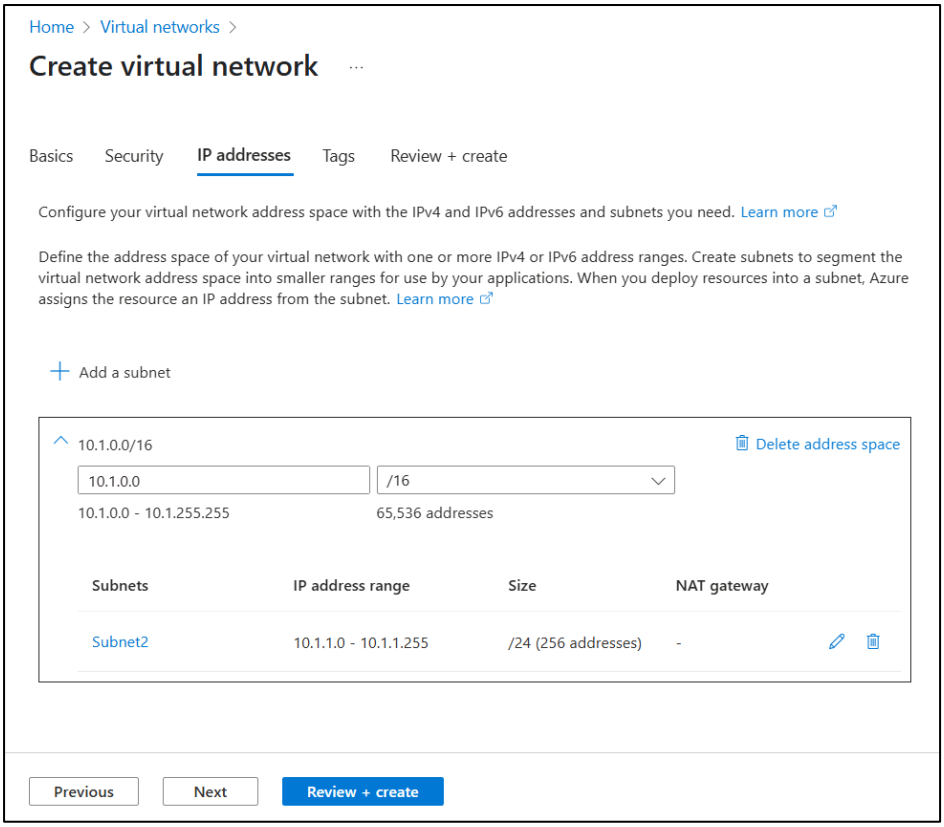
iii. Created 2 Virtual Networks named VNet-1 and VNet-2 in the same region withing same resource group.
Vnet-1: Address Space: 10.0.0.0/16
Subnet: name – Subnet1 - 10.0.1.0/24



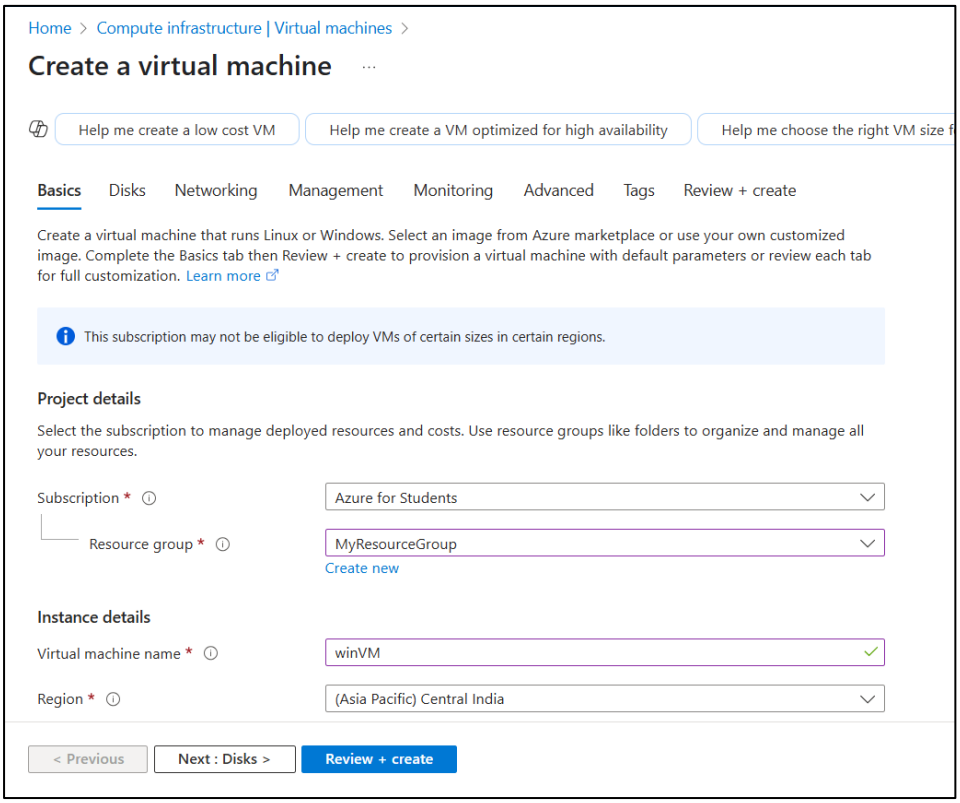


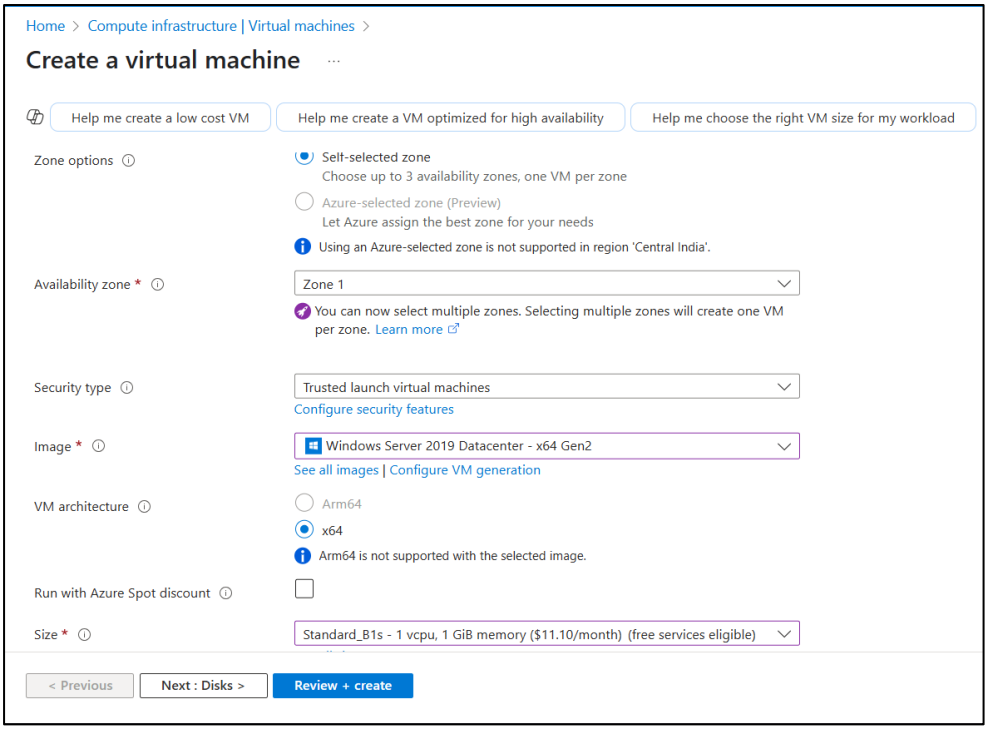
Vnet-2: Address Space: 10.1.0.0/16
Subnet: name – Subnet2 - 10.1.1.0/24

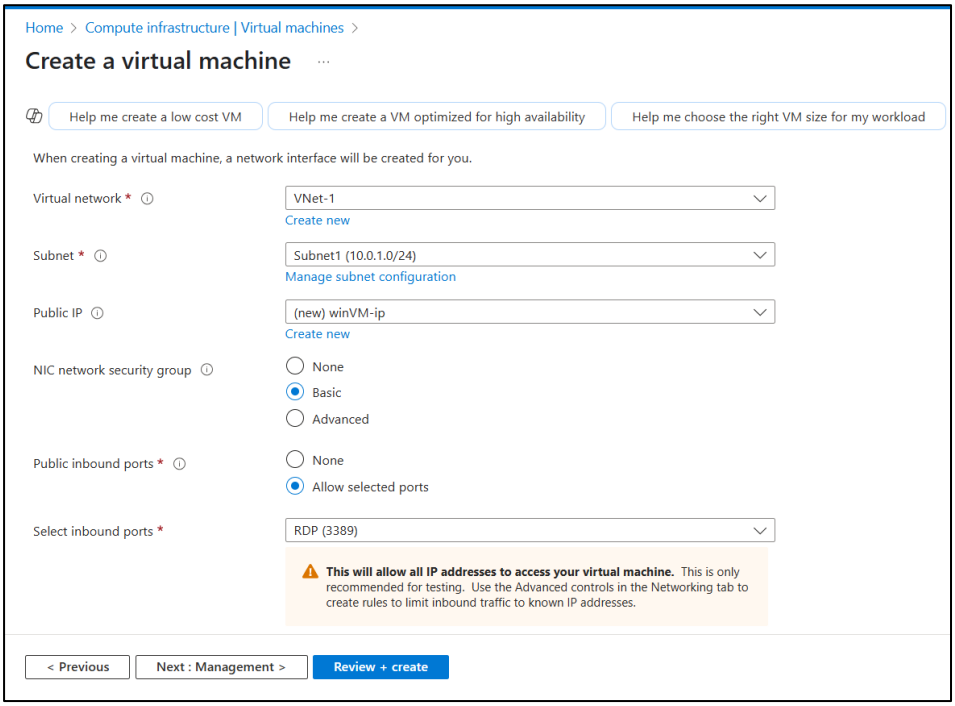




iv. Created windows virtual machine in subnet1 of VNet-1.
Configurations: Name: WinVM
Resource group: MyResourceGroup
Image: Windows Server 2019
Size: Standard_B1s
VNet: VNet1
Subnet: Subnet1







v. Created linux virtual machine in VNet-2 subnet2.

vi. Configurations: Name: linuxVM

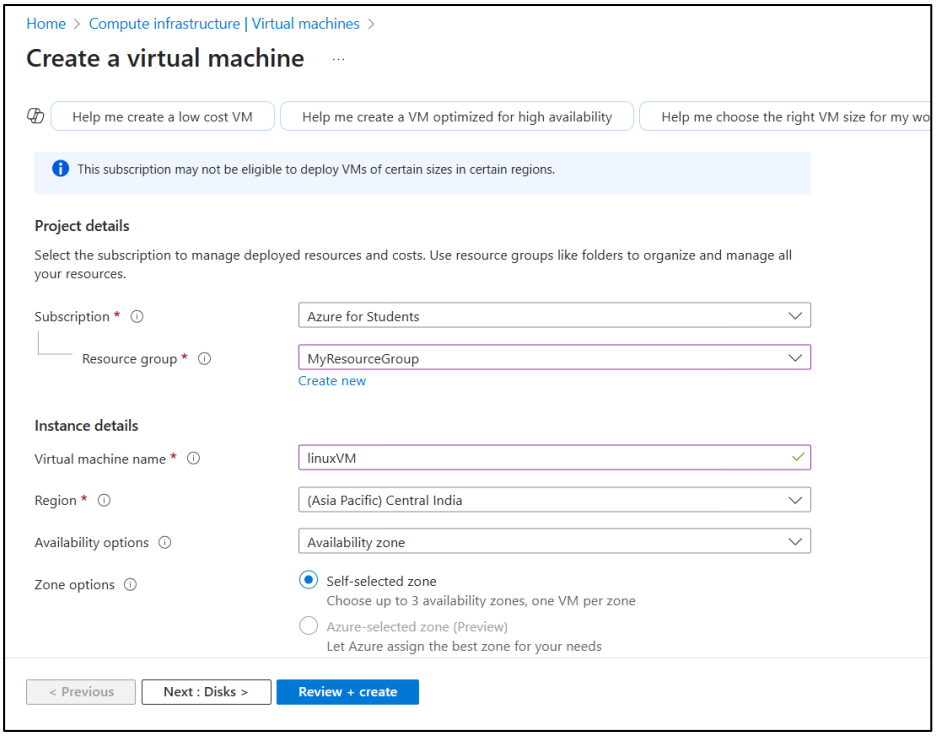
Resource group: MyResourceGroup

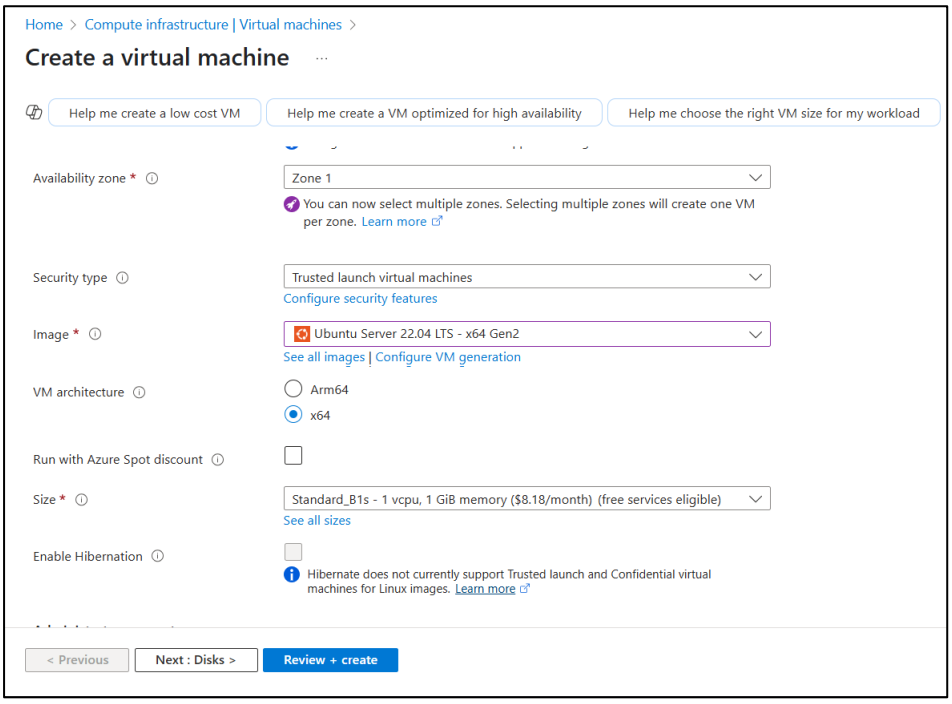
Image: Ubuntu

Size: Standard_B1s

VNet: VNet2

Subnet: Subnet2


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 wo
This subscription may not be eligible to deploy VMs of certain sizes in certain regions.
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
Virtual machine name *
linuxVM
Region *
(Asia Pacific) Central India
Availability options
Availability zone
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
< 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
Availability zone *
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
Hibernate does not currently support Trusted launch and Confidential virtual machines for Linux images. Learn more
< Previous
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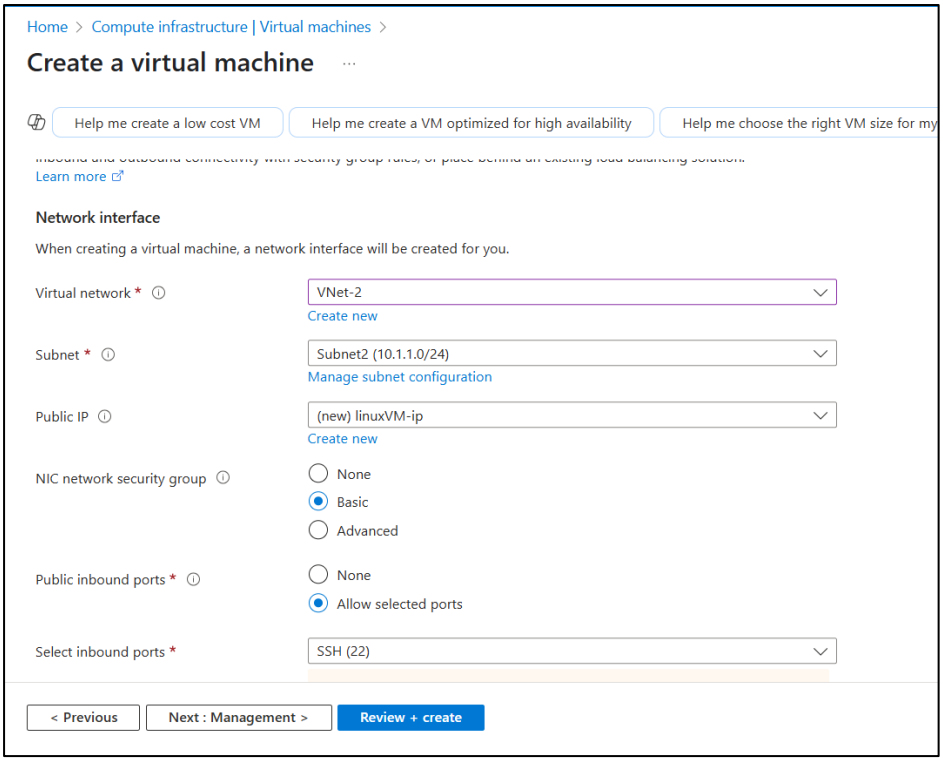
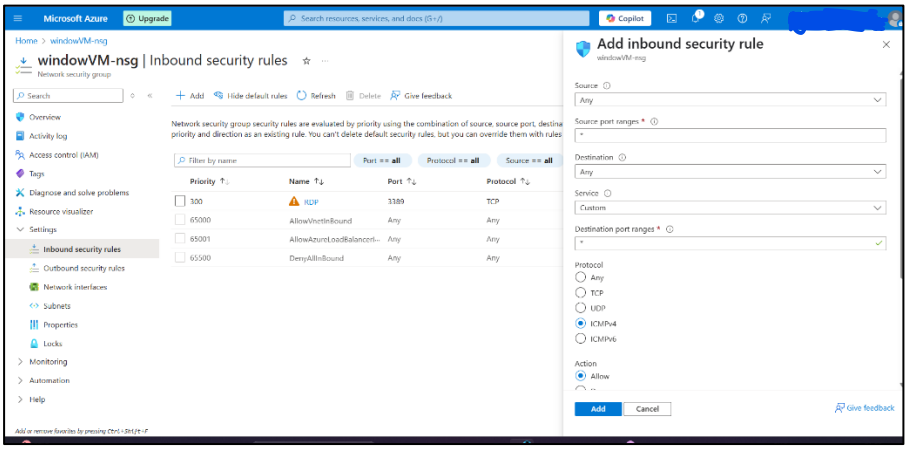
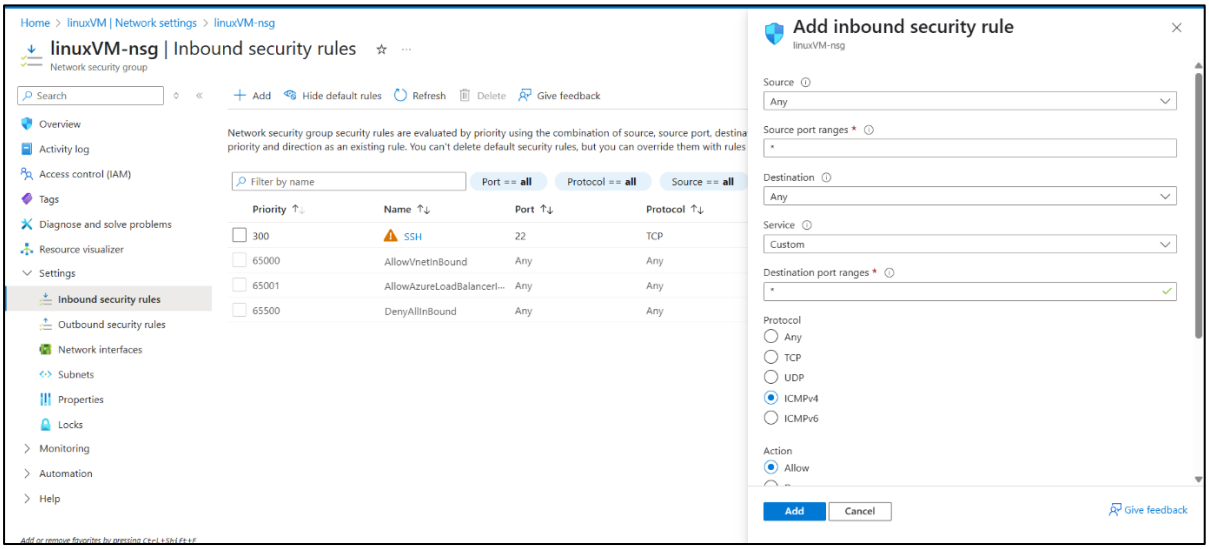


vii. Created NSG (Network Security Group) for ICMP(ping)





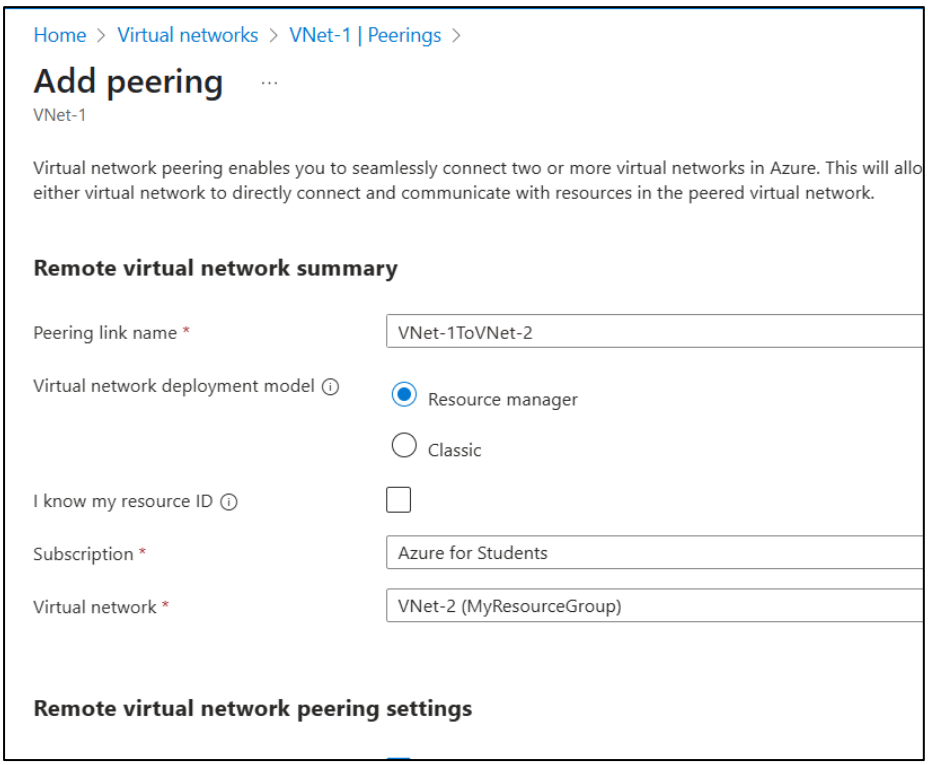
viii. Set up VNet peering

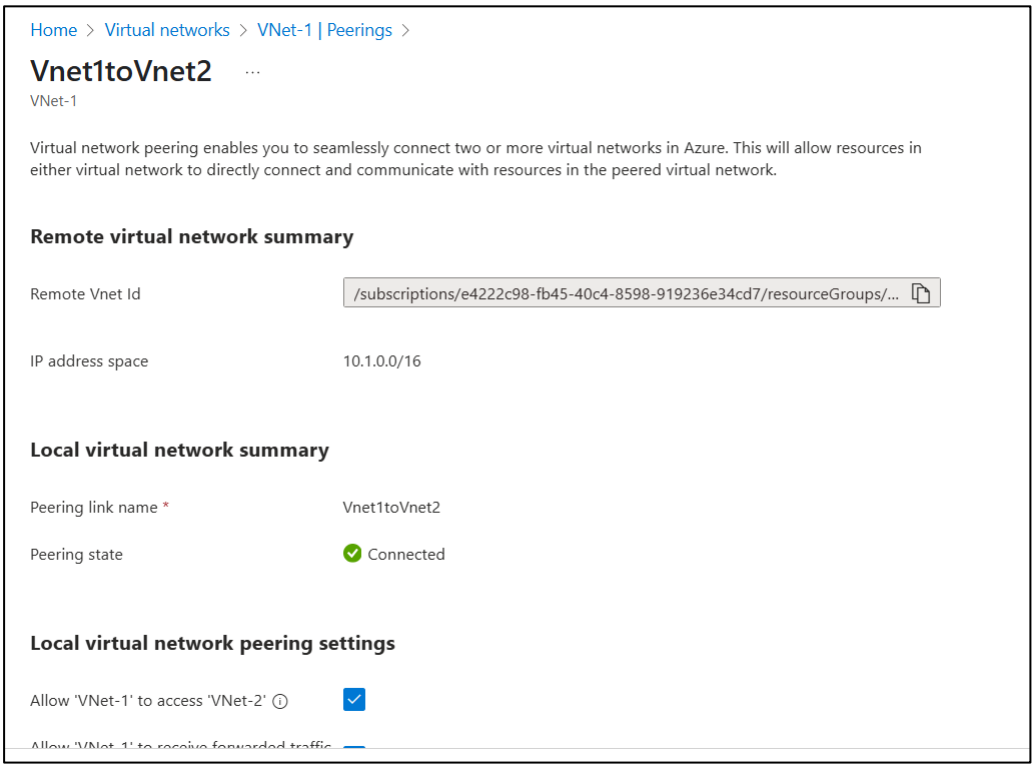
Configuration: name: VNet-1ToVNet-2

Virtual network: VNet-2

Allow traffic to remote virtual network.

Allow forwarded traffic



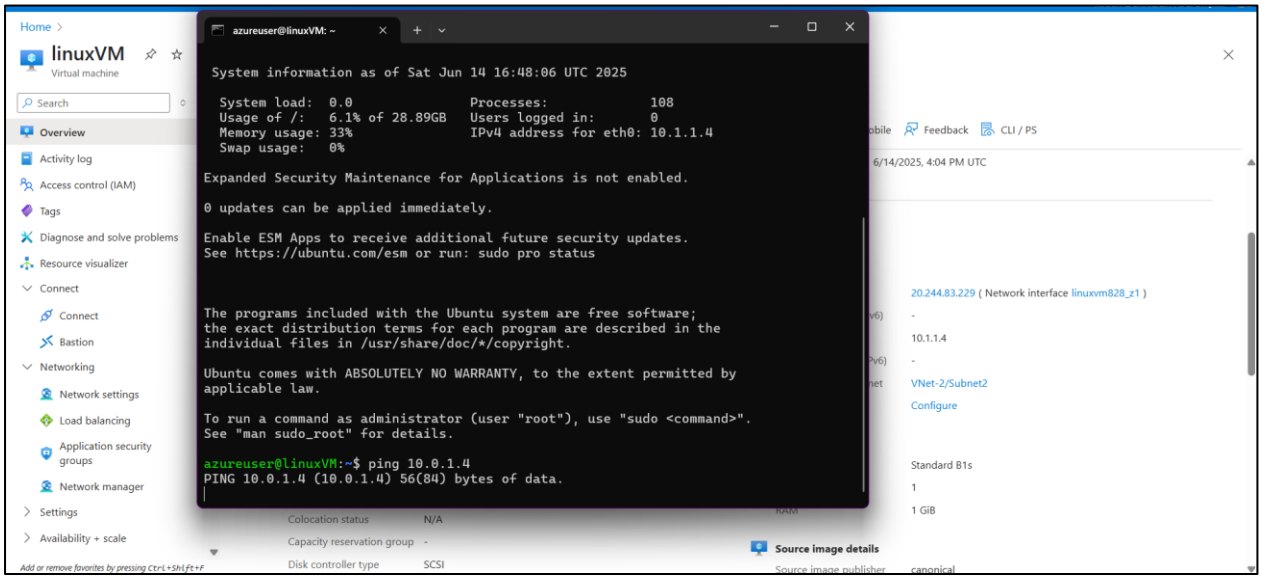


5. Result

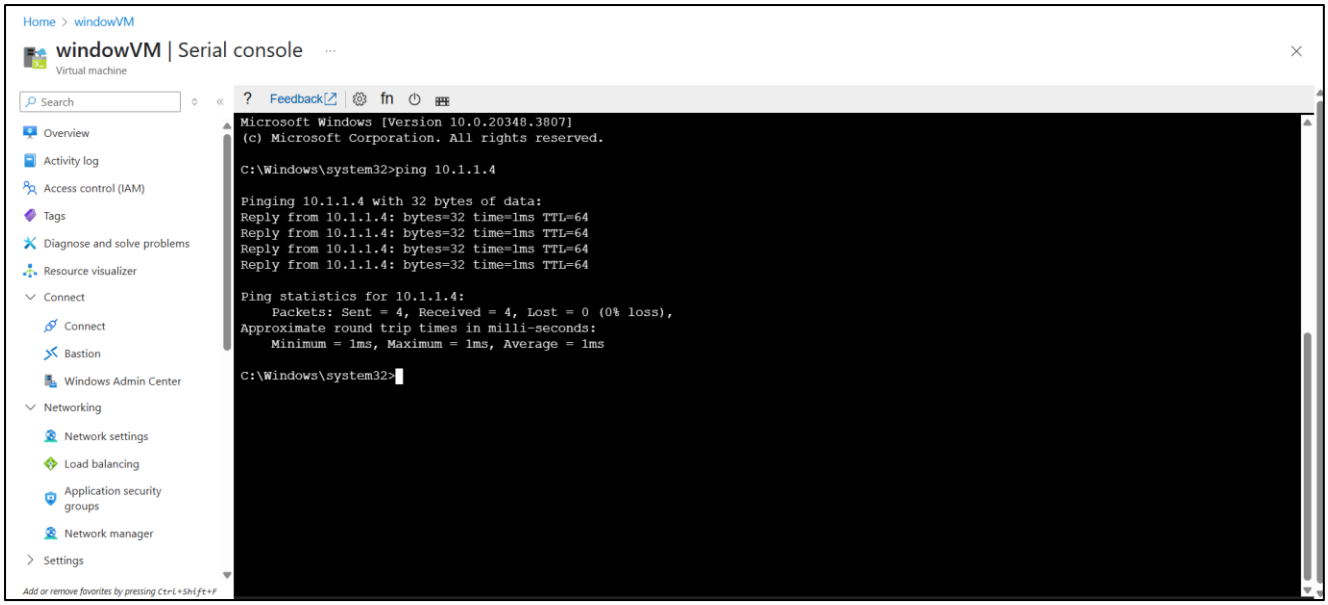
VNet peering successfully implemented
VMs in different subnets in were able to ping each other.

Windows : serial console
Linux: cmd prompt

Linux ping test



Windows ping test



6. Troubleshooting

Problem 1: VM Is Not Visible While Being Created
Solution: VNet is located in a different area. When creating a virtual machine, go to the VNet settings, check the Region, and match it.

Problem 2: 'None' is displayed for public IP
Solution: when configuring the virtual machine, disable the public IP. Go to VM → Networking → Add Public IP under NIC settings to resolve the issue.

Problem 3: The Ping command is not functioning.
Solution: Adding an inbound NSG rule is the solution.

Problem 4: Peering isn't functioning
Solution: Verify that peering is enabled in Bidirection. Make sure both peerings have "Allow traffic to remote virtual network" enabled.

7. References:

- https://learn.microsoft.com/en-us/azure/virtual-network/virtual-networks-overview
- https://www.geeksforgeeks.org/devops/difference-between-azure-vnet-and-subnet/
- https://www.nubops.com/?gad_source=1&gad_campaignid=22395825021&gbraid=0AAAAAqTd4rhEDLbFGXyvnUa2igDtZzTFH&gclid=Cj0KCQjwu7TCBhCYARIsAM_S3Ngzmynzyf-vTWelPe5bD0tb_H4ghoO1aA5kAX3uDR-H0npYuJ5G79oaAvFrEALw_wcB
- https://azure.microsoft.com/en-in/?ef_id=_k_Cj0KCQjwxo_CBhDbARIsADWpDH66DmaB2iKOVCK9Hjzl1Mqdi27z4zjKfBRmoVOraWJad09GMT6upBIaApLREALw_wcB_k_&OCID=AIDcmmf1elj9v5_SEM__k_Cj0KCQjwxo_CBhDbARIsADWpDH66DmaB2iKOVCK9Hjzl1Mqdi27z4zjKfBRmoVOraWJad09GMT6upBIaApLREALw_wcB_k_&gad_source=1&gad_campaignid=16350744322&gbraid=0AAAADcJh_v_rl0Oj7R4RJA1P3ji7dNmE&gclid=Cj0KCQjwxo_CBhDbARIsADWpDH66DmaB2iKOVCK9Hjzl1Mqdi27z4zjKfBRmoVOraWJad09GMT6upBIaApLREALw_wcB#pill-bar-products_tab3