

CIDR, VNet, Subnet, and VNet Peering (Azure Virtual Network)

1. Overview of Azure Virtual Network (VNet)

Azure Virtual Network (VNet) is the fundamental building block for private communication between Azure resources. It allows you to create isolated, logically segmented networks in the cloud, similar to traditional networks.

2. CIDR (Classless Inter-Domain Routing)

CIDR notation defines IP address ranges for VNets and Subnets.

- **CIDR Format:** <IP Address>/<Prefix Length>
Example: 10.0.0.0/16
- **Prefix Length** defines how many bits are fixed for network address; the rest are for host addressing.

CIDR Total IPs Subnet Mask

/16	65,536	255.255.0.0
/24	256	255.255.255.0

3. Azure VNet and Subnet Basics

- A VNet spans a region and contains multiple subnets.
- Subnets allow resource segmentation within a VNet.

✓ You created:

- VNet1 → CIDR: 10.0.0.0/16
 - Subnet1 (for Linux VM): 10.0.1.0/24
 - Subnet2 (for Windows VM): 10.0.2.0/24
 - VNet2 → CIDR: 10.1.0.0/16
 - Subnet3: 10.1.1.0/24
-


4. VM Deployment (Use Case Execution)

✓ You Deployed:

- **Linux VM in VNet1/Subnet1**
 - **Windows VM in VNet1/Subnet2**
 - **Enabled ping between both VMs by:**
 - **Adding firewall rules in both OS**
 - **Ensuring NSG allows ICMP (ping)**
-

5. Azure VNet Peering

VNet Peering connects two VNets to enable private communication.

Type	Direction	Notes
Intra-region	↔	Between VNets in same region
Global Peering 		Between VNets in different regions

✓ You Configured:

- **Peering: VNet1 ↔ VNet2**
 - **Allowed traffic in both directions (no gateway or forwarded traffic)**
-

STEP 1: Create VNet1 in Central India with 2 subnets

1. Go to [Azure Portal](#)
2. Search **Virtual Networks** > + **Create**
3. In **Basics**:
 - Subscription: your default
 - Resource Group: create new → rg-demo
 - Name: VNet1
 - Region: **Central India**

Create virtual network ...

Basics Security IP addresses Tags Review + create

Azure Virtual Network (VNet) is the fundamental building block for your private network in Azure. VNet enables many types of Azure resources, such as Azure Virtual Machines (VM), to securely communicate with each other, the internet, and on-premises networks. VNet is similar to a traditional network that you'd operate in your own data center, but brings with it additional benefits of Azure's infrastructure such as scale, availability, and isolation.

[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 *	<div>Azure for Students</div>
Resource group *	<div>rg-demo</div>

[Create new](#)

Instance details

Virtual network name *	<div>VNet1</div>
Region * ⓘ	<div>(Asia Pacific) Central India</div>

[Deploy to an Azure Extended Zone](#)

1. In IP Addresses:

- IP space: 10.0.0.0/16
- Click + **Add subnet**:
 - Subnet 1: Name windows-subnet, IP 10.0.1.0/24
 - Subnet 2: Name linux-subnet, IP 10.0.2.0/24

Configure your virtual network address space with the IPv4 and IPv6 addresses and subnets you need. [Learn more](#)

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

10.0.0.0/16

Delete address space

10.0.0.0

/16

10.0.0.0 - 10.0.255.25565,536 addresses

Subnets	IP address range	Size	NAT gateway	
default	10.0.0.0 - 10.0.0.255	/24 (256 addresses)	-	<div><div></div><div></div></div>
windows-subnet	10.0.1.0 - 10.0.1.255	/24 (256 addresses)	-	<div><div></div><div></div></div>
linux-subnet	10.0.2.0 - 10.0.2.255	/24 (256 addresses)	-	<div><div></div><div></div></div>

Add IPv4 address space |

Create virtual network ...

- Basics
- Security
- IP addresses
- Tags
- Review + create**

[View automation template](#)

Basics

Subscription	Azure for Students
Resource Group	rg-demo
Name	VNet1
Region	Central India

Security

Azure Bastion	Disabled
Azure Firewall	Disabled
Azure DDoS Network Protection	Disabled

IP addresses

Address space	10.0.0.0/16 (65,536 addresses)
Subnet	default (10.0.0.0/24) (256 addresses)
Subnet	windows-subnet (10.0.1.0/24) (256 addresses)
Subnet	linux-subnet (10.0.2.0/24) (256 addresses)

Tags

1. Click **Review + Create** → **Create**

VNet1-1749908995544 | Overview ...

Deployment

Search x << Delete Cancel Redeploy Download Refresh

Overview

- Inputs
- Outputs
- Template

✓ Your deployment is complete

Deployment name : VNet1-1749908995544
Subscription : [Azure for Students](#)
Resource group : [rg-demo](#)

Start time : 6/14/2025, 7:20:00 PM
Correlation ID : 1fd40ff6-b826-4992-81f3-3fec3f52cd37

> Deployment details

✓ Next steps

[Go to resource](#)

Give feedback

[Tell us about your experience with deployment](#)

VNet1-1749908995544

- Overview
- Inputs
- Outputs
- Template

STEP 2: Create Cheapest Windows VM in windows-subnet

1. Go to **Virtual Machines** > + **Create**
2. In **Basics**:
 - Name: **winvm**
 - Region: **Central India**
 - Image: **Windows Server 2019 Datacenter**
 - Size: Click "See all sizes" → choose **B1s** (cheapest)
 - Username: **azureuser**
 - Password: your strong password
 - Inbound ports: **RDP (3389)**
3. In **Networking** tab:
 - VNet: **VNet1**
 - Subnet: **windows-subnet**
4. Click **Review + Create** → **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](#)

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. [Learn more](#)

i 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 * ⓘ

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

Security type ⓘ
[Configure security features](#)

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

x The selected image is not valid for the specified location. Select a different location.

VM architecture ⓘ

- ☐ Arm64
- ☒ x64
- i** Arm64 is not supported with the selected image.

Run with Azure Spot discount ⓘ ☐

Size * ⓘ
[See all sizes](#)

Enable Hibernation ⓘ ☐
i Hibernation is not supported by the size that you have selected. Choose a size that is compatible with Hibernation to enable this feature. [Learn more](#)

Administrator account

Username * ⓘ

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

STEP 3: Create Cheapest Linux VM in linux-subnet


1. Same as above but:


- Name: linuxvm
- Image: **Ubuntu Server 20.04 LTS (Gen1)** → Free tier


- Size: **B1s**
- Inbound ports: **SSH (22)**
- Subnet: linux-subnet

2. Create it

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](#)


 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 * 


rg-demo 


[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

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

Availability zone * 

Zone 1 

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

Availability zone * ⓘ Zone 1

You can now select multiple zones. Selecting multiple zones will create one VM per zone. [Learn more](#)

Security type ⓘ Standard

Image * ⓘ Ubuntu Server 20.04 LTS - x64 Gen1

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

There is a generation 2 version of this image available which has higher feature compatibility. [Click here to swap to the generation 2 version](#)

VM architecture ⓘ

☐ Arm64

☒ x64

Arm64 is not supported with the selected image.

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 is not supported by the size that you have selected. Choose a size that is compatible with Hibernation to enable this feature. [Learn more](#)

Administrator account

STEP 4: Allow Ping (ICMP) Between VMs

You have:

- A **Windows VM** in windows-subnet
- A **Linux VM** in linux-subnet
- Both inside the **same VNet1**

Now, follow these two sub-steps:

□ A. On the Windows VM

1. Connect to Windows VM using RDP:

- Go to the Azure Portal → **Virtual Machines**
- Click your WindowsVM → Click **Connect** → Choose **RDP**
- Download the .rdp file and **open it**
- Login with the username and password you gave while creating the VM

 Search


 Refresh  Troubleshoot  More Options  Feedback

 Overview

 Activity log

 Access control (IAM)

 Tags

 Diagnose and solve problems

 Resource visualizer

▼ Connect

 **Connect**

 Bastion

 Windows Admin Center

> Networking

> Settings

> Availability + scale

> Security


> Backup + disaster recovery

> Operations

> Monitoring

> Automation

> Help

 Connecting using
Public IP address | 4.240.97.142 ▼

Admin username
azureuser

Port ([change](#))
3389 [Check access](#) ⓘ

Just-in-time policy
Unsupported by plan ⓘ

Most common



Local machine

Native RDP

Connect via native RDP without any additional software needed. Recommended for testing only.

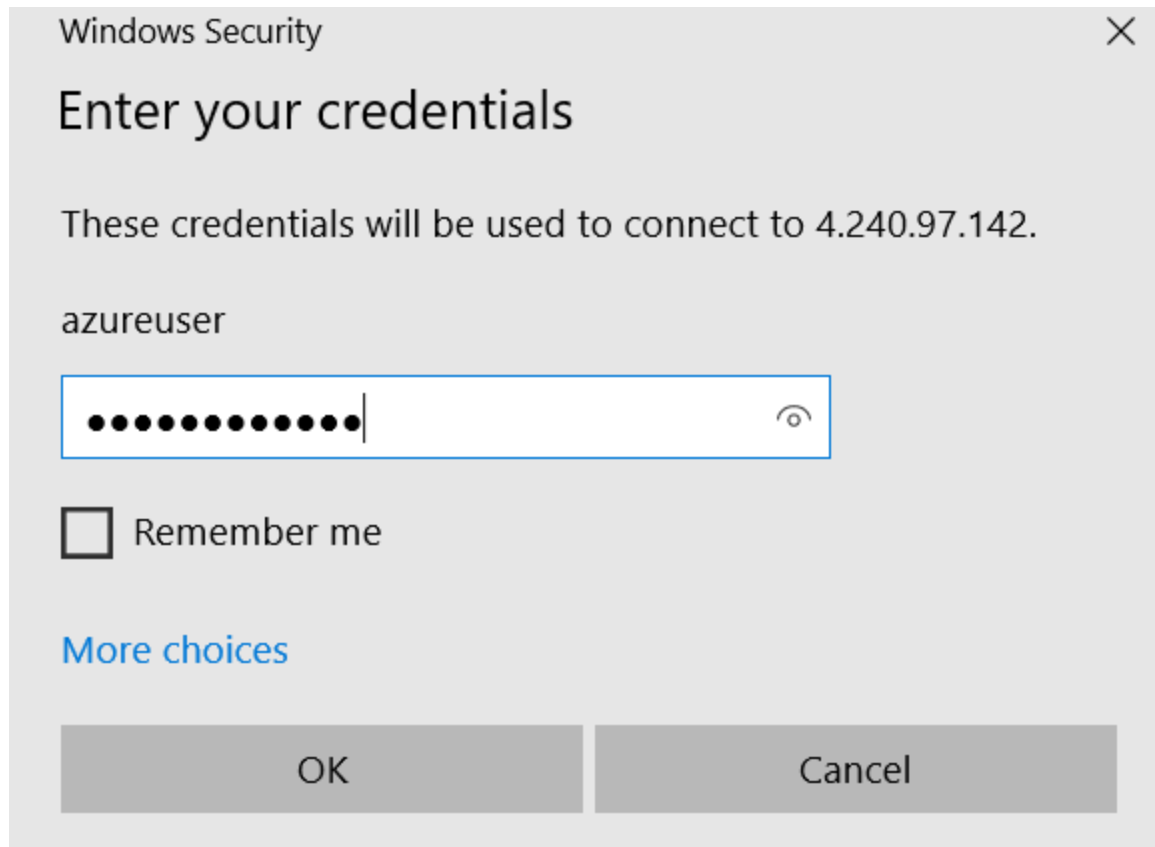
Public IP address (4.240.97.142)

Select

Download RDP file



▼ More ways to connect (4)



1. On your Windows VM:

- Press **Start**
- Type cmd
- **Right-click** on **Command Prompt** → **Run as Administrator**

2. Then paste this:

```
netsh advfirewall firewall add rule name="Allow ICMPv4" protocol=icmpv4:8,any dir=in action=allow
```

This command adds a firewall rule to allow **ping (ICMPv4)** traffic.

winvm - 4.240.97.142:3389 - Remote Desktop Connection



Recycle Bin

Administrator: Command Prompt



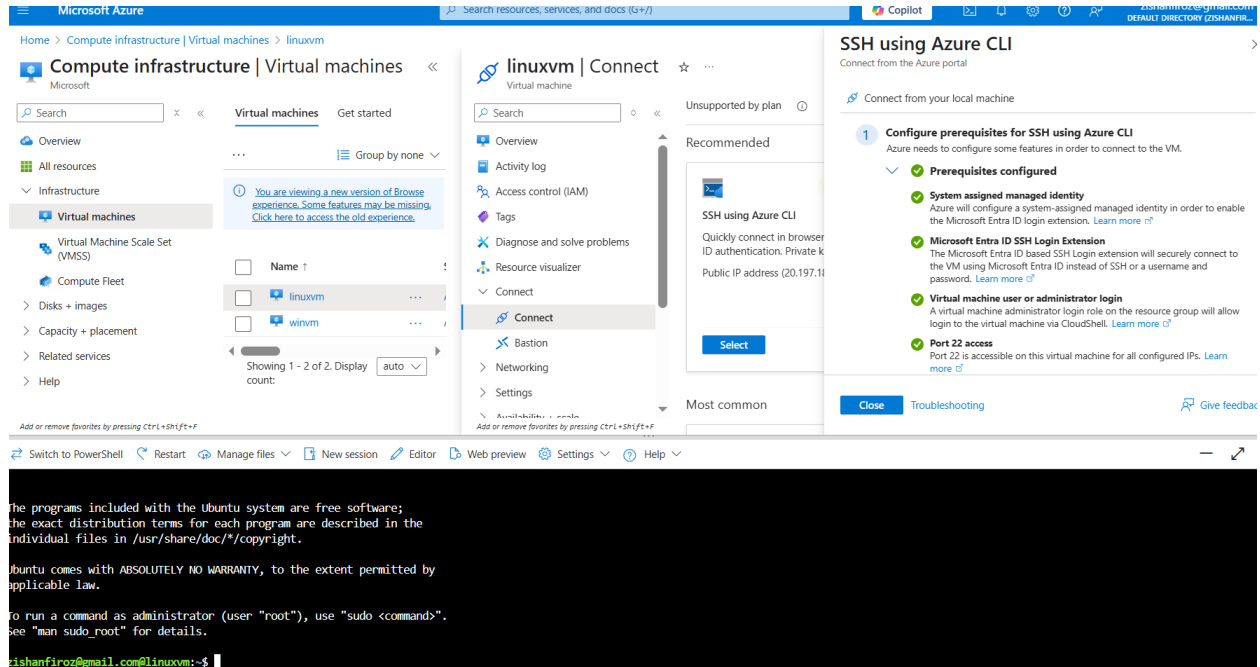
Microsoft Windows [Version 10.0.17763.7434]

(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\azureuser>netsh advfirewall firewall add rule name="Allow ICMPv4" protocol=icmpv4:8,any dir
Ok.

C:\Users\azureuser>

For Linux VM:



Command to Allow ICMP (ping) in UFW:

Run these one by one in your **Linux VM**:

Use iptables (Advanced way)

If you want to **allow only ICMP** without disabling UFW:

```
sudo iptables -A INPUT -p icmp --icmp-type echo-request -s 10.0.0.0/16 -j ACCEPT
```

```
sudo iptables -A INPUT -p icmp --icmp-type echo-reply -s 10.0.0.0/16 -j ACCEPT
```

Then save it (so it persists):

```
sudo apt install iptables-persistent -y
```

```
sudo netfilter-persistent save
```

Switch to PowerShell Restart Manage files New session Editor Web preview Settings Help

```

zishanfiroz@gmail.com@linuxvm:~$ sudo ufw allow from 10.0.0.0/16 to any proto icmp
ERROR: Unsupported protocol 'icmp'
zishanfiroz@gmail.com@linuxvm:~$ sudo ufw disable
Firewall stopped and disabled on system startup
zishanfiroz@gmail.com@linuxvm:~$ sudo iptables -A INPUT -p icmp --icmp-type echo-request -s 10.0.0.0/16 -j ACCEPT
zishanfiroz@gmail.com@linuxvm:~$ sudo iptables -A INPUT -p icmp --icmp-type echo-reply -s 10.0.0.0/16 -j ACCEPT
zishanfiroz@gmail.com@linuxvm:~$ sudo apt install iptables-persistent -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  netfilter-persistent
The following NEW packages will be installed:
  iptables-persistent netfilter-persistent
0 upgraded, 2 newly installed, 0 to remove and 26 not upgraded.
Need to get 13.8 kB of archives.
After this operation, 89.1 kB of additional disk space will be used.
Get:1 http://azure.archive.ubuntu.com/ubuntu focal-updates/universe amd64 netfilter-persistent all 1.0.14ubuntu1 [7268 B]
Get:2 http://azure.archive.ubuntu.com/ubuntu focal-updates/universe amd64 iptables-persistent all 1.0.14ubuntu1 [6552 B]
Fetched 13.8 kB in 1s (17.9 kB/s)
Preconfiguring packages ...
Selecting previously unselected package netfilter-persistent.

```

Now Testing Ping:

Ping <private linux ip>

```

Administrator: Command Prompt

Microsoft Windows [Version 10.0.17763.7434]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\azureuser>ping 20.197.18.73

Pinging 20.197.18.73 with 32 bytes of data:
Request timed out.

Ping statistics for 20.197.18.73:
    Packets: Sent = 1, Received = 0, Lost = 1 (100% loss),
Control-C
^C
C:\Users\azureuser>ping 10.0.2.4

Pinging 10.0.2.4 with 32 bytes of data:
Reply from 10.0.2.4: bytes=32 time=2ms TTL=64
Reply from 10.0.2.4: bytes=32 time=1ms TTL=64
Reply from 10.0.2.4: bytes=32 time=1ms TTL=64
Reply from 10.0.2.4: bytes=32 time=1ms TTL=64

Ping statistics for 10.0.2.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms

C:\Users\azureuser>

```

Now same test from linux to windows

```
Switch to PowerShell Restart Manage files New session Editor Web preview Settings Help
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 244 bytes 29834 (29.8 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 244 bytes 29834 (29.8 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

zishanfiroz@gmail.com@linuxvm:~$ ping 10.0.1.4
PING 10.0.1.4 (10.0.1.4) 56(84) bytes of data.
64 bytes from 10.0.1.4: icmp_seq=1 ttl=128 time=1.17 ms
64 bytes from 10.0.1.4: icmp_seq=2 ttl=128 time=1.66 ms
64 bytes from 10.0.1.4: icmp_seq=3 ttl=128 time=2.63 ms
64 bytes from 10.0.1.4: icmp_seq=4 ttl=128 time=2.54 ms
64 bytes from 10.0.1.4: icmp_seq=5 ttl=128 time=2.12 ms
64 bytes from 10.0.1.4: icmp_seq=6 ttl=128 time=1.62 ms
64 bytes from 10.0.1.4: icmp_seq=7 ttl=128 time=1.87 ms
64 bytes from 10.0.1.4: icmp_seq=8 ttl=128 time=1.84 ms
64 bytes from 10.0.1.4: icmp_seq=9 ttl=128 time=1.28 ms
64 bytes from 10.0.1.4: icmp_seq=10 ttl=128 time=1.60 ms
```

Step 5: Create VNet2 in Central India (or same region as VNet1)

◆ 1. Create VNet2

1. Go to **Azure Portal** → Search **Virtual Networks** → Click + **Create**
2. In **Basics**:
 - Resource Group: rg-demo (or same as VNet1)
 - Name: VNet2
 - Region: **Central India** (same as VNet1)
3. In **IP Addresses** tab:
 - IP space: 10.1.0.0/16
 - Subnet name: vnet2-subnet
 - Subnet range: 10.1.1.0/24
4. Click **Review + Create** → **Create**

Create virtual network ...

[Basics](#) [Security](#) [IP addresses](#) [Tags](#) [Review + create](#)

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[Learn more.](#) 

Project details

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Subscription *	<input type="text" value="Azure for Students"/>
Resource group *	<input type="text" value="rg-demo"/>

[Create new](#)

Instance details

Virtual network name *	<input type="text" value="VNet2"/>
Region * ⓘ	<input type="text" value="(Asia Pacific) Central India"/>

[Deploy to an Azure Extended Zone](#)

2. Set Up VNet Peering Between VNet1 and VNet2

You'll create **two peering connections** — one from VNet1 → VNet2, and one from VNet2 → VNet1.

A. Peering from VNet1 to VNet2

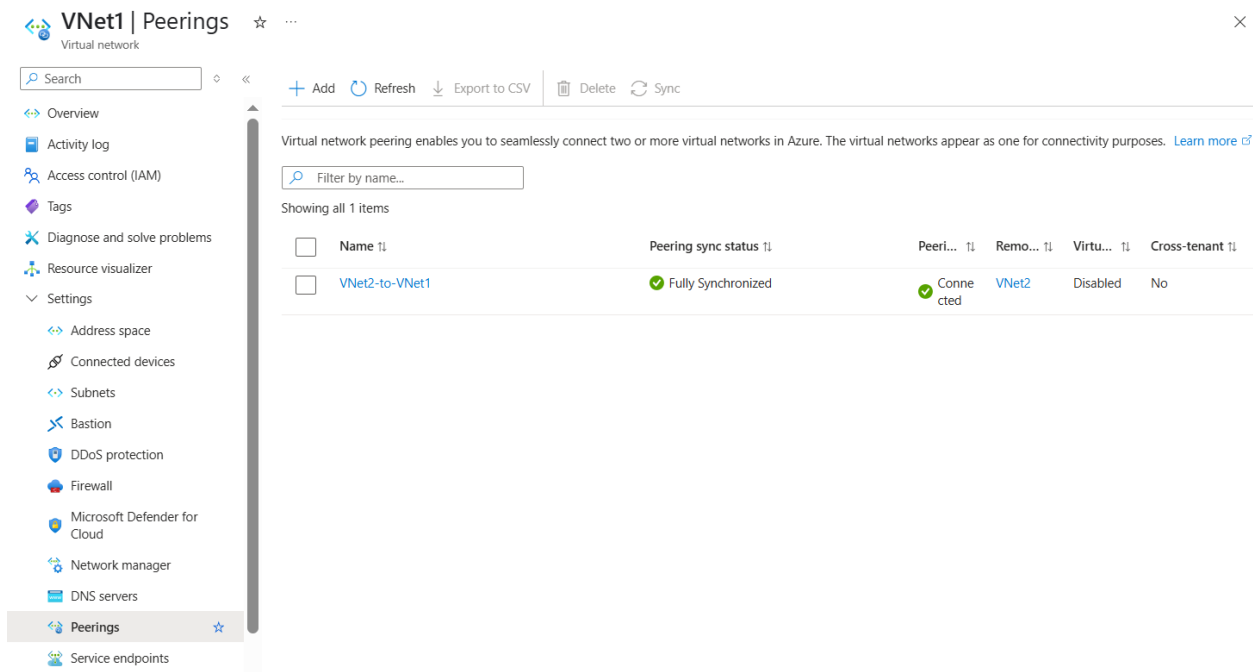
1. Go to **Virtual Networks** → Click on **VNet1**
 2. Go to **Peerings** (left menu) → Click + **Add**
 3. Fill the form:
 - Peering link name: VNet1-to-VNet2
 - Remote virtual network: Select **VNet2**
 - Allow traffic between virtual networks: **Yes**
 - Allow forwarded traffic: **No**
 - Use remote gateway: **No**
 4. Click **Add**
-

B. Peering from VNet2 to VNet1

1. Fill the form:

- Peering link name: VNet2-to-VNet1
- Remote virtual network: Select **VNet1**
- Allow traffic between virtual networks: **Yes**
- Allow forwarded traffic: **No**
- Use remote gateway: **No**

2. Click **Add**



VNet1 | Peerings ☆ ...

Virtual network

Search

+ Add Refresh Export to CSV Delete Sync

Virtual network peering enables you to seamlessly connect two or more virtual networks in Azure. The virtual networks appear as one for connectivity purposes. [Learn more](#)

Filter by name...

Showing all 1 items

<input type="checkbox"/>	Name 11	Peering sync status 11	Peeri... 11	Remo... 11	Virtu... 11	Cross-tenant 11
<input type="checkbox"/>	VNet2-to-VNet1	✓ Fully Synchronized	✓ Connected	VNet2	Disabled	No

Overview
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Resource visualizer
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Subnets
Bastion
DDoS protection
Firewall
Microsoft Defender for Cloud
Network manager
DNS servers
Peerings ☆
Service endpoints

Search

+ Add Refresh Export to CSV Delete Sync

- Overview
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 - Peerings**
 - Service endpoints

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Filter by name...

Showing all 1 items

<input type="checkbox"/>	Name	Peering sync status	Peeri...	Remo...	Virtu...	Cross-tenant
<input type="checkbox"/>	VNet1-to-VNet2	Fully Synchronized	Connected	VNet1	Disabled	No