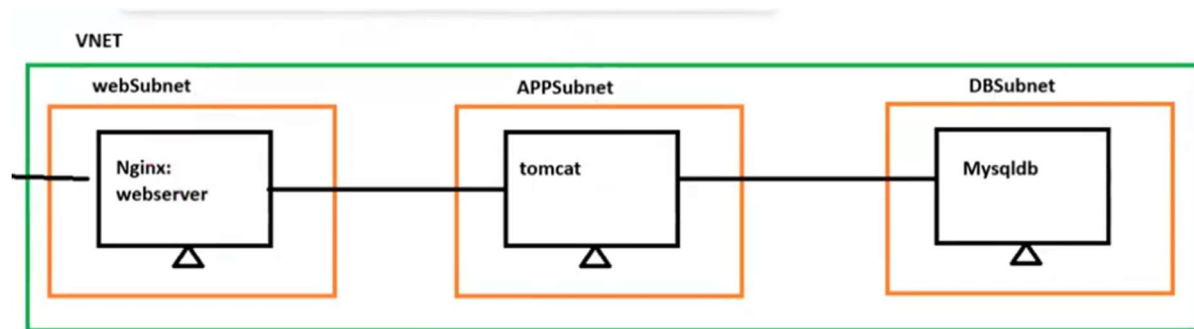


Three Tier Architecture

→ In the three architecture here we can connect web server to app server and app server to db server.

→ It is mainly used for connecting the real world application.

→ Here we can connect three machines.



→ First we want to create a Resource Group.

→ Then create a vnet in the vnet we can create two virtual machines.

→ Creating a Virtual network.

The screenshot shows the 'Create a virtual machine' page in the Microsoft Azure portal. The page is titled 'Create a virtual machine' and includes several sections for configuration:

- Subscription:** Azure subscription 1
- Resource group:** Sai-rg
- Instance details:**
 - Virtual machine name:** WebVm
 - Region:** (Canada) Canada Central
 - Availability options:** No infrastructure redundancy required
 - Security type:** Standard
 - Image:** Ubuntu Server 24.04 LTS - x64 Gen2 (free services eligible)
- VM architecture:** x64

At the bottom, there are navigation buttons: '< Previous', 'Next : Disks >', and 'Review > create'. A 'Give feedback' link is also present in the bottom right corner.

Microsoft Azure Upgrade Search resources, services, and docs (G+7) Copilot

Home > Compute infrastructure | Virtual machines

Create a virtual machine

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

Network interface

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

Virtual network (New) vnet-1 (Sai-rg) Edit virtual network

Subnet (New) Web-subnet Edit subnet 172.16.0.0 - 172.16.0.255 (256 addresses)

Public IP (new) WebVm-ip Create new

Public IP addresses have a nominal charge. [Estimate price](#)

NIC network security group (None) Basic Advanced

Public inbound ports (None) Allow selected ports

Select inbound ports SSH (22)

This will allow all IP addresses to access your virtual machine. This is only recommended for testing. Use the Advanced controls in the Networking tab to

< Previous Next: Management > Review + create Give feedback

→ Adding Virtual network name and ip address.

→ Creating two Subnets

→ One is Web Subnet

→ And is another Subnet is App Subnet

Microsoft Azure Upgrade Search resources, services, and docs (G+7) Copilot

Home > Compute infrastructure | Virtual machines > Create a virtual machine

vnet-canadacentral

Name vnet-1

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

172.16.0.0/16 Delete address space

172.16.0.0 /16 172.16.0.0 - 172.16.0.255 65,536 addresses

Subnets	IP address range	Size	NAT gateway
Web-subnet	172.16.0.0 - 172.16.0.255	/24 (256 addresses)	-
App-Subnet	172.16.1.0 - 172.16.1.255	/24 (256 addresses)	-

Add IPv4 address space

Save Cancel

Microsoft Azure Upgrade Search resources, services, and docs (G+7) Copilot

Home > CreateVm-canonicalubuntu-24_04-Its-server-20260131234413 | Overview

WebVm

Virtual machine

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

Overview

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

Connect Start Restart Stop Hibernate Capture Delete Refresh Open in mobile Feedback CLI / PS

Virtual machine

Computer name	WebVm
Operating system	Linux (ubuntu 24.04)
VM generation	V2
VM architecture	x64
Agent status	Ready
Agent version	2.15.0.1
Hibernation	Disabled
Host group	-
Host	-
Proximity placement group	-
Colocation status	N/A
Capacity reservation group	-
Disk controller type	SCSI

Azure Spot

Azure Spot	-
Azure Spot eviction policy	-

Networking

Public IP address	52.139.32.241 (Network interface webvm665)
Public IP address (IPv6)	-
Private IP address	172.16.1.4
Private IP address (IPv6)	-
Virtual network/subnet	vnet-1/Web-Subnet
DNS name	Configure

Size

Size	Standard D2ls v5
vCPUs	2
RAM	4 GiB

Source image details

Source image publisher	canonical
Source image offer	ubuntu-24_04-Its
Source image plan	server

→Network Security Group for WebVm

Microsoft Azure | Upgrade | Search resources, services, and docs (G+/I)

Home > Compute infrastructure | Virtual machines > WebVm

WebVm | Network settings

Rules

Network security group WebVm-nsg (attached to networkinterface: webvm665)
Impacts 0 subnets, 1 network interfaces

Search rules

Source == all Destination == all Protocol == all Action == all Port == all

Priority	Name	Port	Protocol	Source	Destination	Action
Inbound port rules (5)						
300	SSH	22	TCP	Any	Any	Allow
320	HTTP	80	TCP	Any	Any	Allow
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalancerInBound	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInBound	Any	Any	Any	Any	Deny
Outbound port rules (3)						

→Installed nginx and browsing nginx on the browser

Not secure http://52.139.32.241

Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

→Creating an App Virtual machine.

Microsoft Azure | Upgrade | Search resources, services, and docs (G+/I)

Home > Compute infrastructure | Virtual machines

Create a virtual machine

Subscription * Azure subscription 1

Resource group * Sai-rg

Instance details

Virtual machine name * AppVm

Region * (Canada) Canada Central

Availability options No infrastructure redundancy required

Security type Standard

Image * Ubuntu Server 24.04 LTS - x64 Gen2 (free services eligible)

VM architecture x64

< Previous Next : Disks > Review + create

→Selecting the virtual network and subnet already we have created for App VM

Microsoft Azure Upgrade Search resources, services, and docs (G+/) Copilot

Home > Compute infrastructure | Virtual machines

Create a virtual machine

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

Basics Disks **Networking** Management Monitoring Advanced Tags Review + create

Define network connectivity for your virtual machine by configuring network interface card (NIC) settings. You can control ports, inbound and outbound connectivity with security group rules, or place behind an existing load balancing solution. [Learn more](#)

Network interface

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

Virtual network [Edit virtual network](#)

Subnet [Edit subnet](#) 172.16.0.0 - 172.16.0.255 (256 addresses)

Public IP [Create new](#)

☒ Public IP addresses have a nominal charge. [Estimate price](#)

NIC network security group ☐ None ☒ Basic ☐ Advanced

Public inbound ports ☐ None ☒ Allow selected ports

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

→ Created APP Virtual Machine.

Microsoft Azure Upgrade Search resources, services, and docs (G+/) Copilot

Home > Compute infrastructure | Virtual machines

AppVm Virtual machine

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

Search

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

Connect Networking Settings Availability + scale Security Backup + disaster recovery Operations Monitoring Automation Help

Resource group (move): Sai-rg

Status: Running

Location: Canada Central

Subscription (move): Azure subscription 1

Subscription ID: a3107e0d-376f-4650-b383-aa7b2b3c0c9a

Operating system: Linux (ubuntu 24.04)

Size: Standard D2ls v5 (2 vcpus, 4 GiB memory)

Primary NIC public IP: 20.63.81.139 [1 associated public IPs](#)

Virtual network/subnet: vnet-1/App-subnet

DNS name: Not configured

Health state: -

Time created: 1/31/2026, 6:28 PM UTC

Tags (edit): Add tags

Properties

Property	Value
Computer name	AppVm
Operating system	Linux (ubuntu 24.04)
VM generation	V2
VM architecture	x64
Agent status	Ready
Agent version	2.15f.0.1

Networking

Property	Value
Public IP address	20.63.81.139 (Network interface appvm959)
Public IP address (IPv6)	-
Private IP address	172.16.0.4
Private IP address (IPv6)	-
Virtual network/subnet	vnet-1/App-subnet

→ Installed Tomcat on the APP VM and browsing the public ip of AppVm.

← → Not secure http://20.63.81.139:8080

Home Documentation Configuration Examples Wiki Mailing Lists Find Help

Apache Tomcat/11.0.18

If you're seeing this, you've successfully installed Tomcat. Congratulations!

Recommended Reading:

- [Security Considerations How-To](#)
- [Manager Application How-To](#)
- [Clustering/Session Replication How-To](#)

Server Status Manager App Host Manager

Developer Quick Start

Tomcat Setup	Realms & AAA	Examples	Servlet Specifications
First Web Application	JDBC DataSources		Tomcat Versions

→Creating a Db Virtual machine.

Microsoft Azure | Upgrade | Search resources, services, and docs (G+)

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

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

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 * [Deploy to an Azure Extended Zone](#)

Availability options

Security type

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

< Previous | Next : Disks > | **Review + create**

[Give feedback](#)

→Creating a Vnet for Db.

→For free tier we can only create 4cpu's in single region that's why we create two Vm's in single region. Third Vm created in another region.

Microsoft Azure | Upgrade | Search resources, services, and docs (G+)

Home > Compute infrastructure | Virtual machines > Create a virtual machine

vnet-centralindia

Name *

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

Subnets	IP address range	Size	NAT gateway
	172.17.0.0 /16	65,536 addresses	

This address space overlaps with the default Docker bridge network address. If you are using Docker, or Azure Kubernetes service with Azure container networking interface, select a different address space. [Learn more](#)

You must add at least one subnet to the virtual network.

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

Name *

IPv4

Include an IPv4 address space ☒

IPv4 address range

Starting address *

Size

Subnet address range

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.

[Give feedback](#)

Home > CreateVm-canonical.ubuntu-24.04-lts-server-202601001130 | Overview

DbVm

Virtual machine

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

Search | Help me copy this VM in any region

Connect | Start | Restart | Stop | Hibernate | Capture | Delete | Refresh | Open in mobile | Feedback | CLI / PS

Resource group (move) : Sai-rg

Status : Running

Location : Central India

Subscription (move) : Azure subscription 1

Subscription ID : a3107e0d-376f-4650-b383-aa7b2b3c0c9a

Tags (edit) : Add tags

Properties | Monitoring | Capabilities (7) | Recommendations | Tutorials

Virtual machine

Computer name : DbVm

Operating system : Linux (ubuntu 24.04)

VM generation : V2

VM architecture : x64

Agent status : Ready

Agent version : 2.15.0.1

Networking

Public IP address : 52.140.120.34 (Network interface dbvm247)

1 associated public IPs

Public IP address (IPv6) : -

Private IP address : 172.18.0.4

Private IP address (IPv6) : -

Virtual network/subnet : DbVnet/db-subnet

Operating system : Linux (ubuntu 24.04)

Size : Standard D2ls v5 (2 vcpus, 4 GiB memory)

Primary NIC public IP : 52.140.120.34

1 associated public IPs

Virtual network/subnet : DbVnet/db-subnet

DNS name : Not configured

Health state : -

Time created : 1/31/2026, 6:45 PM UTC

→ Installed mysql on DbVm.

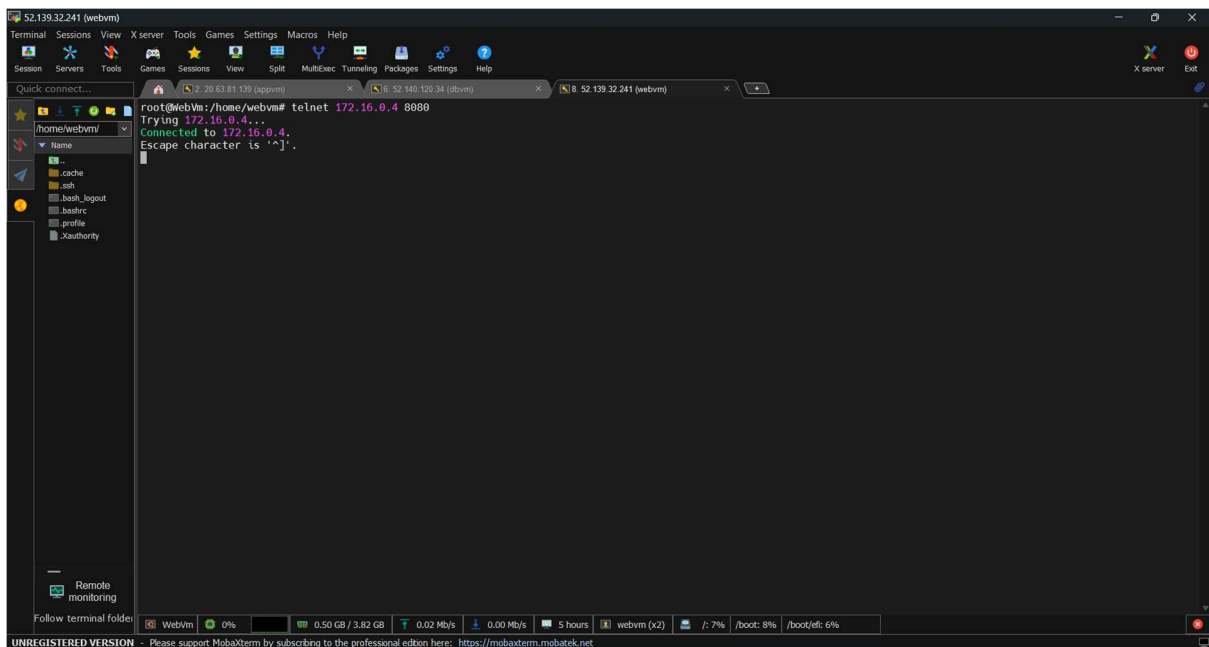
→ Changed the bind address to 0.0.0.0

```
root@DbVm:/home/dbvm# systemctl status mysql
● mysql.service - MySQL Community Server
   Loaded: loaded (/usr/lib/systemd/system/mysql.service; enabled; preset: enabled)
   Active: active (running) since Sat 2026-01-31 18:49:49 UTC; 2min 22s ago
     Process: 3238 ExecStartPre=/usr/share/mysql/mysql-systemd-start pre (code=exited, status=0/SUCCESS)
    Main PID: 3247 (mysqld)
      Status: "Server is operational"
        Tasks: 37 (limit: 4662)
       Memory: 368.2M (peak: 380.9M)
          CPU: 800ms
      CGroup: /system.slice/mysql.service
              └─3247 /usr/sbin/mysqld

Jan 31 18:49:48 DbVm systemd[1]: Starting mysql.service - MySQL Community Server...
Jan 31 18:49:49 DbVm systemd[1]: Started mysql.service - MySQL Community Server.
root@DbVm:/home/dbvm#
```

→ Connection from Web server to App Server.

→ telnet <appvtip> 8080

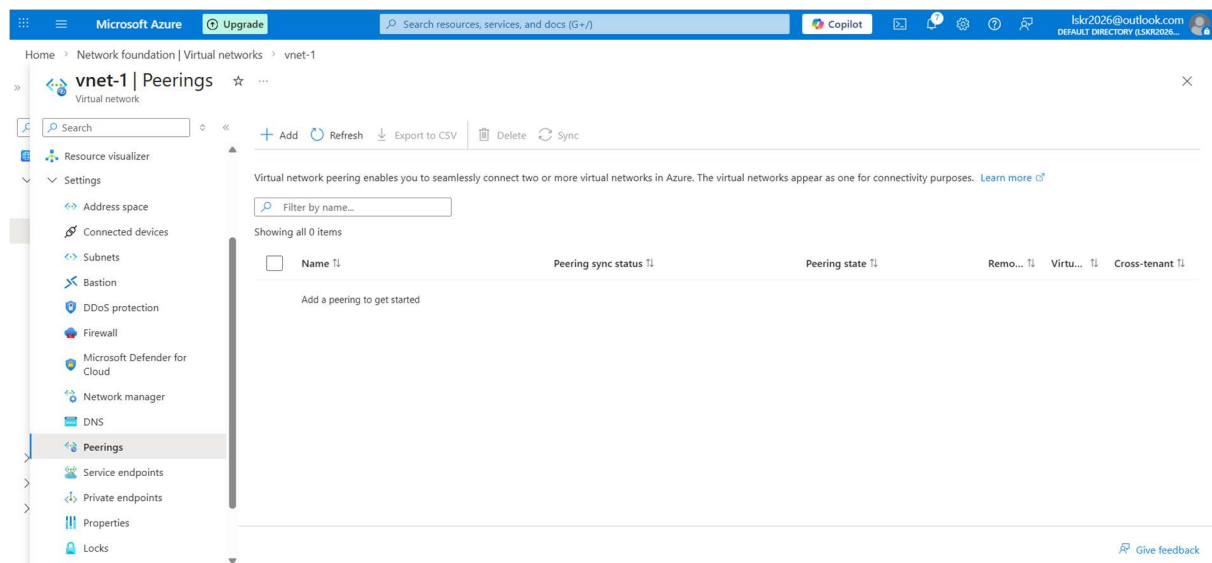


→ Web server and app server both are in the same vnet that's why they can communicate.

→ But making the connection from app server to Db server both are in different regions and in different Virtual networks.

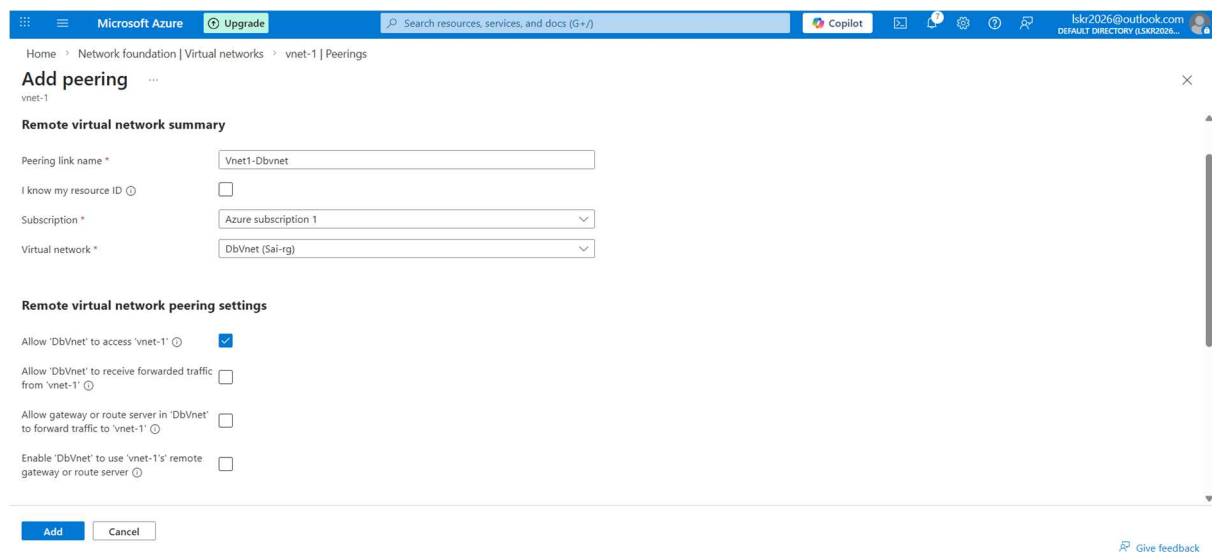
→ We want to make communication between two Vnets. First we did Vnet Peering then only we check the communication between app and Db.

→Go to the Vnet and select peerings and click on add.

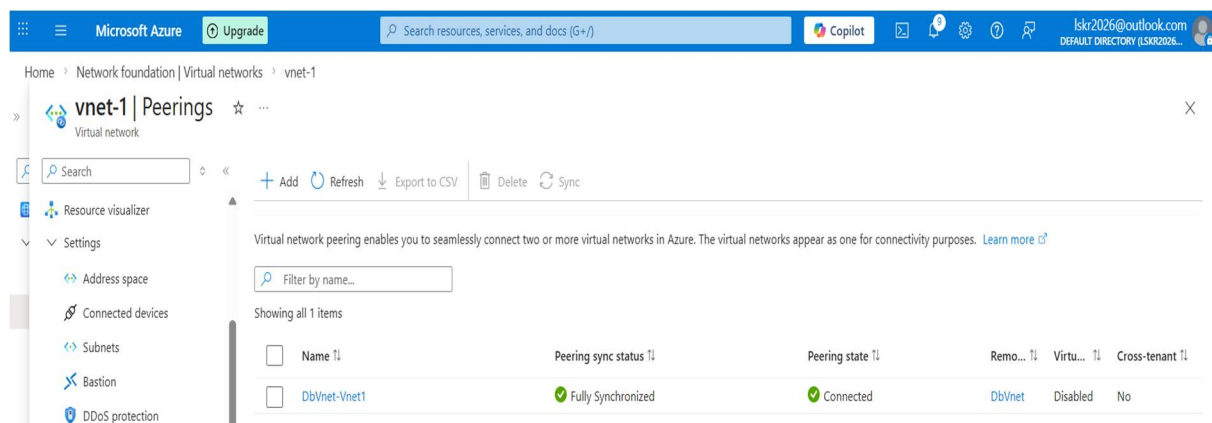


→Here I can open from vnet1 and make communication to DbVnet

→Selecting Virtual network as DbVnet and finally click on add.



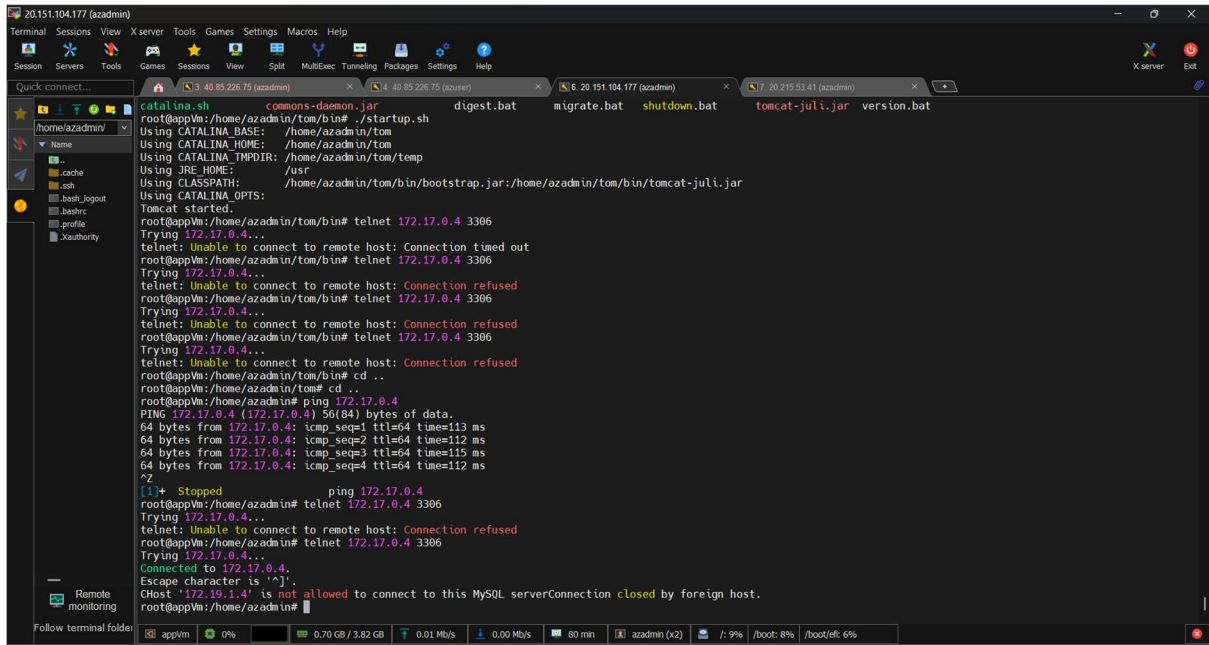
→The peering can be done.



→ Here we check the communication between the AppVnet and DbVnet.

→ Before that we check ping <dbpvt ip>.

→ If the peering has done the communication will work.



```
20.151.104.177 (azadmin)
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
Quick connect...
catalina.sh commons-daemon.jar digest.bat migrate.bat shutdown.bat tomcat-juli.jar version.bat
/home/azadmin/
Name
.cache
.ssh
.ssh_logout
.bashrc
.profile
.xauthority
root@appVm:/home/azadmin/tom/bin# ./startup.sh
Using CATALINA_BASE:   /home/azadmin/tom
Using CATALINA_HOME:   /home/azadmin/tom
Using CATALINA_TMPDIR: /home/azadmin/tom/temp
Using JRE_HOME:        /usr
Using CLASSPATH:       /home/azadmin/tom/bin/bootstrap.jar:/home/azadmin/tom/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
root@appVm:/home/azadmin/tom/bin# telnet 172.17.0.4 3306
Trying 172.17.0.4...
telnet: Unable to connect to remote host: Connection timed out
root@appVm:/home/azadmin/tom/bin# telnet 172.17.0.4 3306
Trying 172.17.0.4...
telnet: Unable to connect to remote host: Connection refused
root@appVm:/home/azadmin/tom/bin# telnet 172.17.0.4 3306
Trying 172.17.0.4...
telnet: Unable to connect to remote host: Connection refused
root@appVm:/home/azadmin/tom/bin# telnet 172.17.0.4 3306
Trying 172.17.0.4...
telnet: Unable to connect to remote host: Connection refused
root@appVm:/home/azadmin/tom/bin# cd ..
root@appVm:/home/azadmin/tom# cd ..
root@appVm:/home/azadmin# ping 172.17.0.4
PING 172.17.0.4 (172.17.0.4) 56(84) bytes of data:
64 bytes from 172.17.0.4: icmp_seq=1 ttl=64 time=113 ms
64 bytes from 172.17.0.4: icmp_seq=2 ttl=64 time=112 ms
64 bytes from 172.17.0.4: icmp_seq=3 ttl=64 time=115 ms
64 bytes from 172.17.0.4: icmp_seq=4 ttl=64 time=112 ms
^C
root@appVm:/home/azadmin# ping 172.17.0.4
[+] Stopped ping 172.17.0.4
root@appVm:/home/azadmin# telnet 172.17.0.4 3306
Trying 172.17.0.4...
telnet: Unable to connect to remote host: Connection refused
root@appVm:/home/azadmin# telnet 172.17.0.4 3306
Trying 172.17.0.4...
Connected to 172.17.0.4.
Escape character is '^['.
Host '172.19.1.4' is not allowed to connect to this MySQL server
Connection closed by foreign host.
root@appVm:/home/azadmin#
```