

About Rahul Joshi:

22 Years exp, 15th year as Microsoft certified trainer & AWS Authorized instructor

- Helping customers add Application Modernization capabilities by Replatforming ASP.NET sites to Azure App Services, Rearchitecting of monolithic applications to microservices or containers.
- Reengineering of legacy applications to cloud-native apps with improved user experience.
- Designing cloud strategy, solution design, cloud adoption frameworks, app modernization and cloud migration.
- Develop Proof of Concept by working closely with Microsoft and Amazon Web Services and design frameworks for cloud adoption and Enterprise Architecture, Cloud Infrastructure/ Migrations.
- Responsible for Migration to Microsoft Azure (Brownfield and Greenfield Projects). In-Premise To Cloud Migration and Storage Migration.
- Perform Application Readiness Assessment, an investigation at application level in preparation for cloud deployment, to look at issues that will either block or detract from the application's abilities to fully utilize the cloud, then act on this report to ensure cloud readiness.
- Designing applications for scalability
- Migrating to PaaS & Container Architecture, Migrating from Traditional .NET Application Web Apps

"Executed more than 580+ Trainings engagements on Microsoft Azure for more than 220+ clients"

Google Drive Link:

https://drive.google.com/drive/folders/181ebdbVLk5xpLu5ArR_BFWeM9b3N2x3?usp=sharing

Recording:

Please Note, Post Session Completes Zoom Recording Link will be shared on WhatsApp, Download it from Zoom Directly. It will not be uploaded on Google Drive

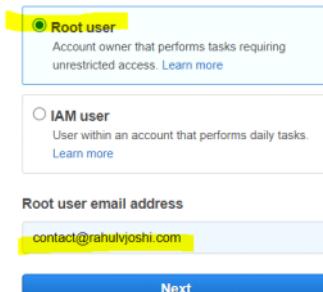
One Note Documentation:

<https://1drv.ms/u/s!Aht-oGFG3XwWgagy2dnZHuXQmk0wkg>

How is Vnet and Subnet designed in AWS - Amazon Web Services

<https://aws.amazon.com/console/>

Sign in



The screenshot shows the AWS sign-in interface for a root user. It features two radio button options: "Root user" (selected) and "IAM user". Below each option is a brief description. A "Next" button is at the bottom.

<input checked="" type="radio"/> Root user Account owner that performs tasks requiring unrestricted access. Learn more
<input type="radio"/> IAM user User within an account that performs daily tasks. Learn more

Root user email address

Next



Root user sign in

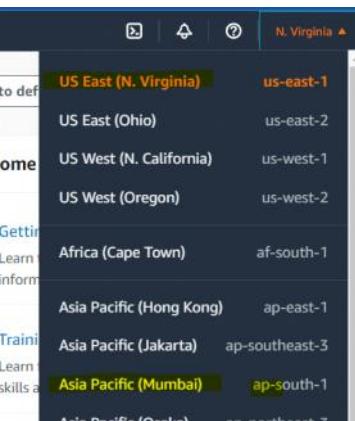
Email: contact@rahulvjoshi.com



The screenshot shows the AWS sign-in page for a root user. It includes fields for "Password" and "Forgot password?", a "Sign in" button, and links for "Sign in to a different account" and "Create a new AWS account".

Sign in to a different account

Create a new AWS account



Networking & Content Delivery

- API Gateway
- AWS App Mesh
- AWS Cloud Map
- CloudFront
- Direct Connect
- Global Accelerator
- AWS Private 5G
- Route 53

The Main Option is VPC



In AWS, Every Region will have by Default 1 VPC already created, this is called "Default VPC" either you can use this, or you can create your own VPC also - VPC means Virtual Network (Azure)

Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR
-	vpc-017f9e0cec55c22ab	Available	172.31.0.0/16	-

Private IPv4 addresses [edit]

The Internet Engineering Task Force (IETF) has directed

RFC 1918 name	IP address range
24-bit block	10.0.0.0 – 10.255.255.255
20-bit block	172.16.0.0 – 172.31.255.255
16-bit block	192.168.0.0 – 192.168.255.255

But in Azure, there is no Virtual Network Created by Default!!

The screenshot shows the 'Virtual networks' section of the Azure portal. At the top, there are buttons for 'Create', 'Manage view', 'Refresh', 'Export to CSV', and 'Open query'. Below these are filters for 'Subscription equals all' and 'Resource group equals all'. A large yellow 'X' is drawn over the entire list area, indicating that no virtual networks have been created.

Regarding Subnet: In AWS, For Every Datacenter (Availability Zone) in that Region, one Subnet is automatically created by AWS. Example In Northern Virginia, there are 6 Availability Zone means 6 Datacenters, for every datacenter there is 1 Dedicated Subnet created by AWS. See the picture below

The screenshot shows the 'Regions' section of the AWS Management Console. It lists several regions with their launch years and local zones:

- US West (Oregon) Region: Launched 2011, Local Zones: 7, Launched 2019.
- US East (Northern Virginia) Region: Availability Zones: 6, Launched 2006, Local Zones: 10, Launched 2020.
- US West (Northern California) Region: Availability Zones: 3*, Launched 2009.
- US East (Ohio) Region: Availability Zones: 3, Launched 2016.
- Canada (Central) Region**: Availability Zones: 3, Launched 2016. Learn more at AWS Canada.
- GovCloud (US-West) Region: Availability Zones: 3, Launched 2011.
- GovCloud (US-East) Region: Availability Zones: 3, Launched 2018.

A yellow bracket highlights the 'Availability Zones: 6' for the US East (Northern Virginia) Region, and another yellow bracket highlights the 'Local Zones: 10' for the same region.

The screenshot shows the 'Subnets' section of the AWS Management Console. It displays a table of subnets with the following data:

Name	Subnet ID	VPC	IPv4 CIDR
-	subnet-0d79cd2f294d95446	vpc-017f9e0cec55c22ab	172.31.64.0/20
-	subnet-081987d4d2965404a	vpc-017f9e0cec55c22ab	172.31.16.0/20
-	subnet-0d35b7c8e723bca87	vpc-017f9e0cec55c22ab	172.31.80.0/20
-	subnet-07d11ce3e17f5f50b	vpc-017f9e0cec55c22ab	172.31.32.0/20
-	subnet-0b22c8c7593427302	vpc-017f9e0cec55c22ab	172.31.48.0/20
-	subnet-0163cb61afdb2312b	vpc-017f9e0cec55c22ab	172.31.0.0/20

A yellow bracket highlights the '6' in the 'Local Zones' column for the US East (Northern Virginia) region, and another yellow bracket highlights the '6' in the 'Availability Zones' column for the same region.

In Azure, as there is no Default Virtual Network, the question of Subnet does not arise.

So, the big difference in virtual Network in Azure and VPC in AWS is, in Azure there is not Default Network and Subnet, but in AWS there is a concept of Default VPC and every VPC will have subnets = availability zone, for each zone, one dedicated Subnet.

The screenshot shows the 'New VPC' creation page. It has a 'Create VPC' button highlighted with a yellow circle. A large yellow arrow points from the 'Actions' dropdown menu to the 'Create VPC' button.

A VPC is an isolated portion of the AWS Cloud populated by AWS objects, such as Amazon EC2.

VPC settings

Resources to create [Info](#)
Create only the VPC resource or the VPC and other networking resources.

VPC only VPC and more

Name tag - optional
Creates a tag with a key of 'Name' and a value that you specify.

IPv4 CIDR block [Info](#)
 IPv4 CIDR manual input IPAM-allocated IPv4 CIDR block

IPv4 CIDR

IPv6 CIDR block [Info](#)
 No IPv6 CIDR block IPAM-allocated IPv6 CIDR block Amazon-provided IPv6 CIDR block IPv6 CIDR owned by me

Tenancy [Info](#)

 You successfully created vpc-060ad1556b8715694 / vpcclientalfa

VPC > Your VPCs > vpc-060ad1556b8715694

vpc-060ad1556b8715694 / vpcclientalfa

[Actions](#)

Details Info			
VPC ID  vpc-060ad1556b8715694	State  Available	DNS hostnames Disabled	DNS resolution Enabled
Tenancy Default	DHCP option set dopt-0334d70381e18c20d	Main route table rtb-030c9edc5b14439ce	Main network ACL acl-076c251797d2e160c
Default VPC No	IPv4 CIDR 192.168.0.0/16	IPv6 pool -	IPv6 CIDR (Network border group) -
Route 53 Resolver DNS Firewall rule groups -	Owner ID  790608953368		

[CIDRs](#) [Flow logs](#) [Tags](#)



 Subnets (6) [Info](#)

<input type="checkbox"/>	Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR
<input type="checkbox"/>	-	subnet-0d79cd2f294d95446	 Available	vpc-017f9e0cec55c22ab	172.31.64.0/20	-
<input type="checkbox"/>	-	subnet-081987d4d2965404a	 Available	vpc-017f9e0cec55c22ab	172.31.16.0/20	-
<input type="checkbox"/>	-	subnet-0d35b7c8e723bca87	 Available	vpc-017f9e0cec55c22ab	172.31.80.0/20	-
<input type="checkbox"/>	-	subnet-07d11ce3e17f5f50b	 Available	vpc-017f9e0cec55c22ab	172.31.32.0/20	-
<input type="checkbox"/>	-	subnet-0b22c8c7593427302	 Available	vpc-017f9e0cec55c22ab	172.31.48.0/20	-
<input type="checkbox"/>	-	subnet-0163cb61afdb2312b	 Available	vpc-017f9e0cec55c22ab	172.31.0.0/20	-

VPC

VPC ID
Create subnets in this VPC.

Select a VPC

vpc-017f9e0cec55c22ab (default)
172.31.0.0/16

vpc-060ad1556b8715694 (vpcclientalfa)
192.168.0.0/16

vpc-060ad1556b8715694 (vpcclientalfa)

Subnet 1 of 1

Subnet name

Create a tag with a key of 'Name' and a value that you specify.

webserversubnet

The name can be up to 256 characters long.

Availability Zone

Choose the zone in which your subnet will reside, or let Amazon choose one for you.

US East (N. Virginia) / us-east-1a

IPv4 CIDR block

192.168.0.0/24

Tags - optional

Key

Name

Value - optional

webserversubnet

Remove

Add new tag

New VPC Experience X

You have successfully created 1 subnet: subnet-0984c04fe6ce1c9a1

Subnets (1) Info

Filter subnets

Subnet ID: subnet-0984c04fe6ce1c9a1	Clear filters		
subnet-0984c04fe6ce1c9a1	Available	vpc-060ad1556b8715694 vpcclientalfa	192.168.0.0/24

Actions ▼ Create subnet

Virtual private cloud

Your VPCs

Subnets

Route tables

Internet gateways

Egress-only internet gateways

In Azure, the configuration is **all in one**

Virtual networks ...

Default Directory (talktorahuljoshioutlook.onmicrosoft)

+ Create Manage view Refresh

Filter for any field... Subscription eq

Name ↑

Create virtual network ...

Basics IP Addresses Security 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 about virtual network](#)

Project details

Subscription * Resource group * [Create new](#)

Instance details

Name * Region *

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

Create virtual network ...

Basics IP Addresses Security Tags Review + create

The virtual network's address space, specified as one or more address prefixes in CIDR notation (e.g. 192.168.1.0/24).

IPv4 address space [Add](#)

Add IPv6 address space

The subnet's address range in CIDR notation (e.g. 192.168.1.0/24). It must be contained by the address space of the virtual network.

[+ Add subnet](#) [Remove subnet](#)

Subnet name	Subnet address range	NAT gateway
<input type="text" value="dbsubnet"/>	<input type="text" value="192.168.0.0/24"/>	-

[A NAT gateway is recommended for outbound internet access from subnets. Edit the subnet to add a NAT gateway. \[Learn more\]\(#\)](#)

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

Create virtual network ...

Basics IP Addresses Security Tags Review + create

BastionHost Disable Enable

DDoS Protection Standard Disable Enable

Firewall Disable Enable

Case Study

The customer was very happy with the way we demonstrated VNET TO VNET Communication between 2 Virtual Networks and that too in 2 Different Regions. The customer was later informed that this Vnet To Vnet using Public Internet for communication and throughput is assigned using SKUs, also the throughputs are aggregated. This is frustrating for the customer, and also very expensive in terms of cost. Also, the business does not run 365*24*7, so the cost of having Virtual Network Gateway is going to be a burden on the finances and budget. Also, the VNG takes time to provision and this can be a challenge when you require connectivity very fast and delay cannot be accepted.

Gateway SKUs by tunnel, connection, and throughput

VPN Gateway Generation	SKU	S2S/VNet-to-VNet Tunnels	P2S SSTP Connections	P2S IKEv2/OpenVPN Connections	Aggregate Throughput Benchmark	BGP	Zone-redundancy
Generation1	Basic	Max. 10	Max. 128	Not Supported	100 Mbps	Not Supported	No
Generation1	VpnGw1	Max. 30	Max. 128	Max. 250	650 Mbps	Supported	No
Generation1	VpnGw2	Max. 30	Max. 128	Max. 500	1 Gbps	Supported	No
Generation1	VpnGw3	Max. 30	Max. 128	Max. 1000	1.25 Gbps	Supported	No
Generation1	VpnGw1AZ	Max. 30	Max. 128	Max. 250	650 Mbps	Supported	Yes
Generation1	VpnGw2AZ	Max. 30	Max. 128	Max. 500	1 Gbps	Supported	Yes
Generation1	VpnGw3AZ	Max. 30	Max. 128	Max. 1000	1.25 Gbps	Supported	Yes
Generation2	VpnGw2	Max. 30	Max. 128	Max. 500	1.25 Gbps	Supported	No
Generation2	VpnGw3	Max. 30	Max. 128	Max. 1000	2.5 Gbps	Supported	No
Generation2	VpnGw4	Max. 100*	Max. 128	Max. 5000	5 Gbps	Supported	No
Generation2	VpnGw5	Max. 100*	Max. 128	Max. 10000	10 Gbps	Supported	No
Generation2	VpnGw2AZ	Max. 30	Max. 128	Max. 500	1.25 Gbps	Supported	Yes

Looking at the above situation the customer is looking for a Plan B, The customer has laid down some critical requirements. See below

1. Cost has to be reduced, As the operations are not 365*24*7, it should be true pay as you go
2. Web Server Connects to DB Server, DB server contains sensitive data, giving Public IP to DB Server VM is against company policies, so DB Server VM will not be given Public IP, so this also has to be considered in the plan B
3. No 100MBPS, No 1.25GBPS, No 5GBPS, bandwidth should be as demand increases, even 1000 GBPS required, should be given and when 100 MBPS is required, we should have that.
4. Configuration should be simple and within 1-2 minutes the configuration has to be completed and connectivity should happen in 1 minute or less than that.

Solutions:

VIRTUAL NETWORK PEERING - VNET PEERING

Peering = Peer = Friend

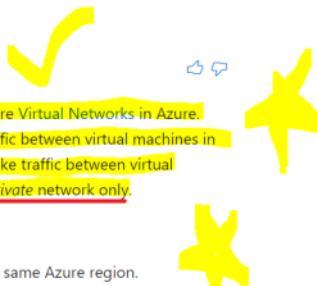
Vnet Peering = Vnet Becoming Friends

Master Website

<https://docs.microsoft.com/en-us/azure/virtual-network/virtual-network-peering-overview>

Virtual network peering

Article • 08/25/2022 • 7 minutes to read • 25 contributors



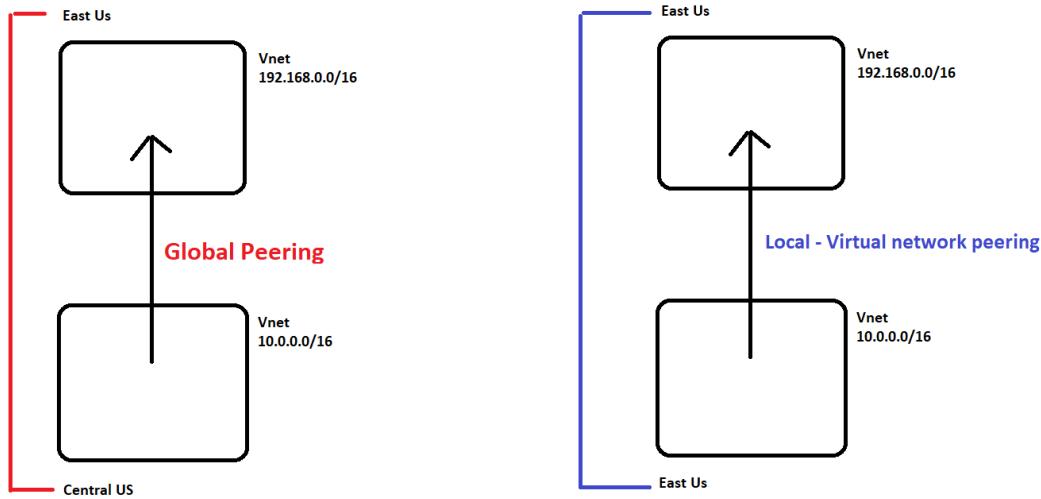
Virtual network peering enables you to seamlessly connect two or more Virtual Networks in Azure. The virtual networks appear as one for connectivity purposes. The traffic between virtual machines in peered virtual networks uses the Microsoft backbone infrastructure. Like traffic between virtual machines in the same network, traffic is routed through Microsoft's private network only.

Azure supports the following types of peering:

- **Virtual network peering**: Connecting virtual networks within the same Azure region.
- **Global virtual network peering**: Connecting virtual networks across Azure regions.

Azure supports the following types of peering:

- **Virtual network peering**: Connecting virtual networks within the same Azure region.
- **Global virtual network peering**: Connecting virtual networks across Azure regions.



Benefit:

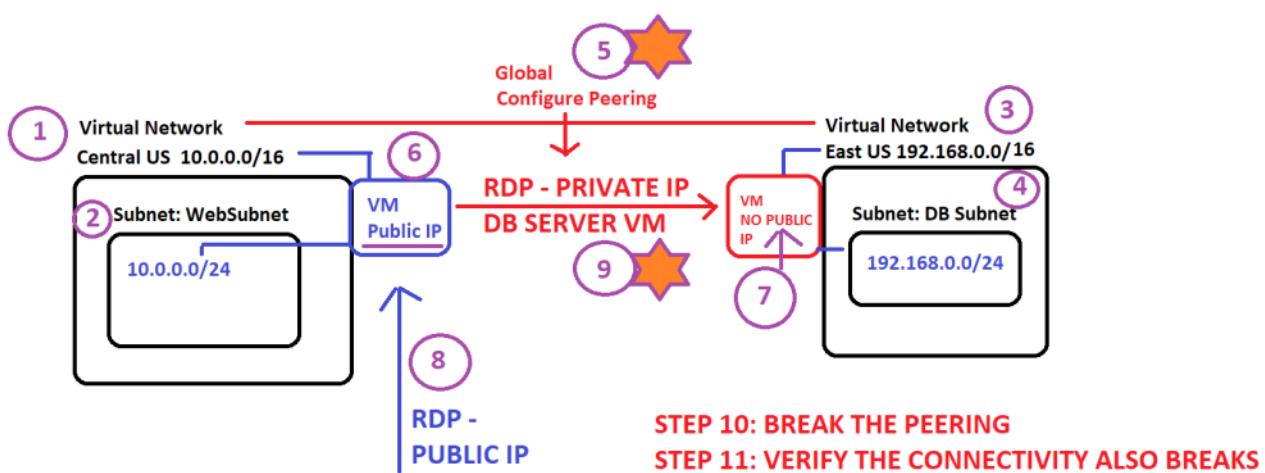
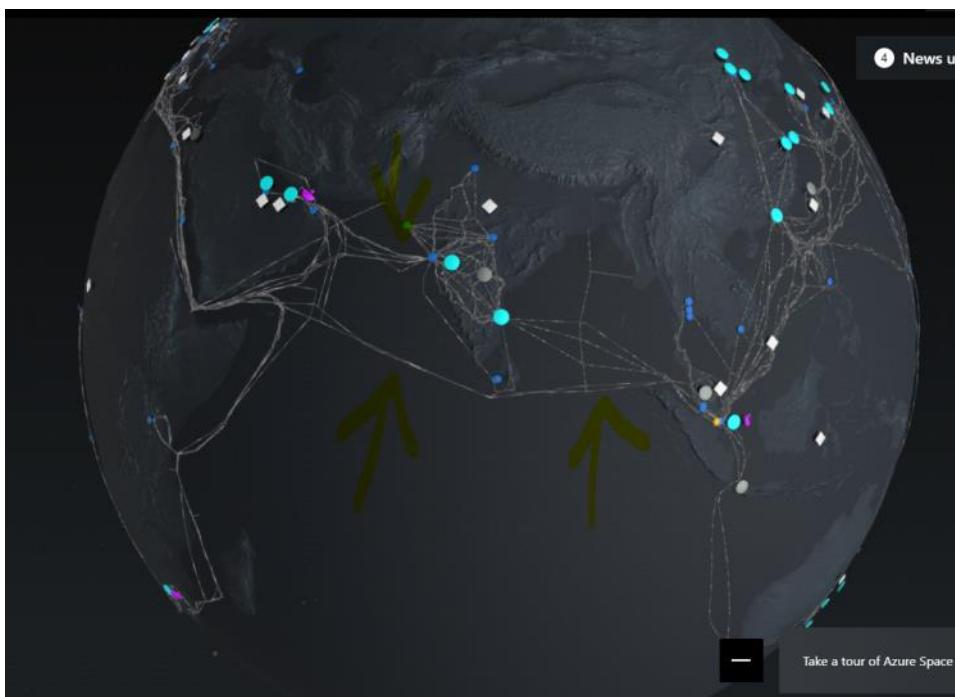
A low-latency, high-bandwidth connection between resources in different virtual networks

FREEDOM FROM GATEWAY, FREEDOM FROM PUBLIC IP, FREEDOM FROM ENCRYPTION

Network traffic between peered virtual networks is private. Traffic between the virtual networks is kept on the Microsoft backbone network. No public Internet, gateways, or encryption is required in the communication between the virtual networks.

Microsoft Backbone?

<https://infrastructuremap.microsoft.com/>



The screenshot shows the Microsoft Azure portal's home page. The left sidebar contains navigation links for creating a resource, home, dashboard, all services, favorites, and various Azure service categories like Resource groups, App Services, Function App, SQL databases, Azure Cosmos DB, Virtual machines, Load balancers, Storage accounts, Virtual networks, and Azure Active Directory. The main content area is titled "Virtual networks" and includes a search bar, a "Default Directory" dropdown set to "talktorahuljoshioutlook.onmicrosoft.com", and a toolbar with "Create", "Manage view", "Refresh", "Export to CSV", and "Open query". Below the toolbar is a filter bar with "Filter for any field...", "Subscription equals all", and "Resource group equals a". A table header row is visible with "Name" and an upward arrow. At the bottom right, there is a call-to-action button labeled "Create a virtual network to securely connect on-premises" with a plus sign icon.

Create virtual network

Basics IP Addresses Security 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 about virtual network](#)

Project details

Subscription * ⓘ MSDN Platforms ▼

Resource group * ⓘ (New) rg-webserver-centralus ▼
[Create new](#)

Instance details

Name * vnetwebservercentralus ✓

Region * Central US ▼

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Create virtual network

Basics IP Addresses Security Tags Review + create

The virtual network's address space, specified as one or more address prefixes in CIDR notation (e.g. 192.168.1.0/24).

IPv4 address space

10.0.0.0/16 10.0.0.0 - 10.0.255.255 (65536 addresses)

Add IPv6 address space ⓘ

Add subnet Remove subnet

Subnet name	Subnet address range	NAT gateway
default	10.0.0.0/24	-

1 A NAT gateway is recommended for outbound internet access from subnets. Edit the subnet to add a NAT gateway. [Learn more](#)

Edit subnet

Subnet name *

Subnet address range *
10.0.0.0 - 10.0.0.255 (251 + 5 Azure reserved addresses)

NAT GATEWAY

Simplify connectivity to the internet using a network address translation gateway. Outbound connectivity is possible without a load balancer or public IP addresses attached to your virtual machines. [Learn more](#)

NAT gateway

SERVICE ENDPOINTS

Create service endpoint policies to allow traffic to specific Azure resources from your virtual network over service endpoints. [Learn more](#)

Services

Actions

Create virtual network

Basics IP Addresses Security Tags Review + create

The virtual network's address space, specified as one or more address prefixes in CIDR notation (e.g. 192.168.1.0/24).

IPv4 address space

10.0.0.0/16 10.0.0.0 - 10.0.255.255 (65536 addresses)

Add IPv6 address space

The subnet's address range in CIDR notation (e.g. 192.168.1.0/24). It must be contained by the address space of the virtual network.

Subnet name Subnet address range NAT gateway

webserversubnet -

A NAT gateway is recommended for outbound internet access from subnets. Edit the subnet to add a NAT gateway. [Learn more](#)

Actions

Download a template for automation

Create virtual network

Basics IP Addresses Security Tags Review + create

BastionHost Disable Enable

DDoS Protection Standard Disable Enable

Firewall Disable Enable

Create virtual network ...

Validation passed

Basics IP Addresses Security Tags **Review + create**

Basics

Subscription	MSDN Platforms
Resource group	(new) rg-webserver-centralus
Name	vnetwebservercentralus
Region	Central US

IP addresses

Address space	10.0.0.0/16
Subnet	webserversubnet (10.0.0.0/24)

Tags

None

Security

BastionHost	Disabled
DDoS protection plan	Basic

Create < Previous Next > Download a template for automation

Now, 2nd Vnet for DB Server - East Us

Virtual networks ...

Default Directory (talktorahuljoshioutlook.onmicrosoft.com)

+ Create Manage view Refresh Export to CSV

Filter for any field... Subscription equals all Resou

Name ↑

Create virtual network ...

Basics IP Addresses Security 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 about virtual network](#)

Project details

Subscription *	MSDN Platforms
Resource group *	(New) rg-dbserver-eastus

Instance details

Name *	vnetdbservereastus
Region *	East US

Review + create < Previous Next : IP Addresses > Download a template for automation

Add subnet

Subnet name *****
dberversubnet

Subnet address range ***** ⓘ
192.168.0.0/24
192.168.0.0 - 192.168.0.255 (251 + 5 Azure reserved addresses)

NAT GATEWAY

Simplify connectivity to the internet using a network address translation gateway. Outbound connectivity is possible without a load balancer or public IP addresses attached to your virtual machines. [Learn more](#)

NAT gateway
None

SERVICE ENDPOINTS

Create service endpoint policies to allow traffic to specific Azure resources from your virtual network over service endpoints. [Learn more](#)

Services ⓘ
0 selected

Add **Cancel**

Create virtual network

Basics **IP Addresses** Security Tags Review + create

The virtual network's address space, specified as one or more address prefixes in CIDR notation (e.g. 192.168.1.0/24).

IPv4 address space

192.168.0.0/16

Add IPv6 address space ⓘ

The subnet's address range in CIDR notation (e.g. 192.168.1.0/24). It must be contained by the address space of the virtual network.

+ Add subnet

Subnet name

Subnet address range

NAT gateway

dberversubnet

192.168.0.0/24

-

A NAT gateway is recommended for outbound internet access from subnets. Edit the subnet to add a NAT gateway. [Learn more](#) ⓘ

Review + create

< Previous

Next : Security >

Download a template for automation

Create virtual network

Basics IP Addresses **Security** Tags Review + create

BastionHost ⓘ

Disable
 Enable

DDoS Protection Standard ⓘ

Disable
 Enable

Firewall ⓘ

Disable
 Enable

Create virtual network ...

Validation passed

Basics IP Addresses Security Tags **Review + create**

Basics

Subscription	MSDN Platforms
Resource group	(new) rg-dbserver-eastus
Name	vnetdbservereastus
Region	East US

IP addresses

Address space	192.168.0.0/16
Subnet	dbserversubnet (192.168.0.0/24)

Tags

None

Security

BastionHost	Disabled
DDoS protection plan	Basic

Create < Previous Next > Download a template for automation

Virtual networks ... Default Directory (talktorahuljoshioutlook.onmicrosoft.com)

+ Create Manage view Refresh Export to CSV Open query Assign tags

Filter for any field... Subscription equals all Resource group equals all Location equals all Add filter

No grouping List view

Name ↑	Resource group ↑	Location ↑	Subscription ↑
vnetdbservereastus	rg-dbserver-eastus	East US	MSDN Platforms
vnetwebservercentralus	rg-webserver-centralus	Central US	MSDN Platforms

Now, is the configuration of Actual Vnet Peering

Home > Virtual networks > vnetwebservercentralus

vnetwebservercentralus | Peerings Virtual network

Search (Ctrl+ /) + Add Refresh Sync

Tags Diagnose and solve problems

Settings

- Address space
- Connected devices
- Subnets
- Bastion
- DDoS protection
- Firewall
- Microsoft Defender for Cloud
- Network manager
- DNS servers
- Peerings**
- Service endpoints
- Private endpoints
- Properties

Filter by name... Peering status

Name ↑ Peering status ↑

Add a peering to get started

Add peering ...

vnetwebservercentralus

This virtual network

Peering link name *

Traffic to remote virtual network ⓘ

Allow (default)

Block all traffic to the remote virtual network

Traffic forwarded from remote virtual network ⓘ

Allow (default)

Block traffic that originates from outside this virtual network

Virtual network gateway or Route Server ⓘ

Use this virtual network's gateway or Route Server

Use the remote virtual network's gateway or Route Server

None (default)

Remote virtual network

Home > Virtual networks > vnetwebservercentralus | Peerings >

Add peering ...

vnetwebservercentralus

Use this virtual network's gateway or Route Server

Use the remote virtual network's gateway or Route Server

None (default)

Remote virtual network

Peering link name *

Virtual network deployment model ⓘ

Resource manager

Classic

I know my resource ID ⓘ

Subscription * ⓘ

Virtual network *

Traffic to remote virtual network ⓘ

Allow (default)

Block all traffic to the remote virtual network

Traffic forwarded from remote virtual network ⓘ

In Virtual Network Gateway, We did connection from both sides, 1st we went to 1st VNG and Created connection from Central Us To East Us, then we went to East Us VNG and created connection from East Us To Central US, so it was a 2 step process in Virtual Network Gateway

But, in Peering, both connections are done on the same screen itself, that is the names are AFriendsB and BFriendsA

A Friends B

This virtual network

Peering link name *

Traffic to remote virtual network ⓘ

Allow (default)

Block all traffic to the remote virtual network

Traffic forwarded from remote virtual network ⓘ

Allow (default)

Block traffic that originates from outside this virtual network

Virtual network gateway or Route Server ⓘ

Use this virtual network's gateway or Route Server

Use the remote virtual network's gateway or Route Server

None (default)

B Friends A

Remote virtual network

Peering link name *

Virtual network deployment model ⓘ

Resource manager

Classic

I know my resource ID ⓘ

Subscription * ⓘ

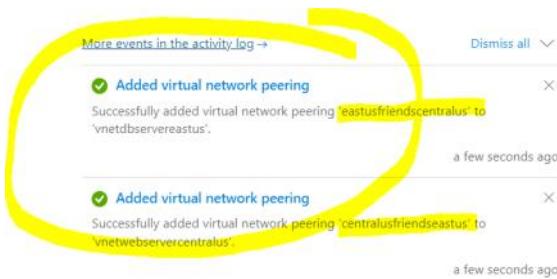
Virtual network *

Traffic to remote virtual network ⓘ

Allow (default)

Block all traffic to the remote virtual network

2- 4 Seconds



Creating 2 VMs, 1 In Central US and 2nd in East Us - **For EAST Us VM we will not give Public IP**

Virtual machines ⚙ ...

Default Directory (talktorahuljoshioutlook.onmicrosoft.com)

+ Create Switch to classic

Filter for any field... Subscript

Create a virtual machine ...

Subscription * ⓘ MSDN Platforms

Resource group * ⓘ rg-webserver-centralus

Instance details

Virtual machine name * ⓘ VMWebServer

Region * ⓘ (US) Central US

Availability options ⓘ No infrastructure redundancy required

Security type ⓘ Standard

Image * ⓘ Windows Server 2016 Datacenter - Gen2

VM architecture ⓘ

Run with Azure Spot discount ⓘ

Size * ⓘ Standard_B2ms - 2 vcpus, 8 GiB memory (₹5,248.79/month)

Create a virtual machine ...

Basics Disks Networking Management 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 * ⓘ vnetwebservercentralus

Subnet * ⓘ webserversubnet (10.0.0.0/24)

Public IP ⓘ (new) VMWebServer-ip

NIC network security group ⓘ

Public inbound ports * ⓘ

Select inbound port * ⓘ RDP (2290)

Review + create < Previous Next : Management >

Please Make Sure, Public IP is given to this VM, as we will 1st connect to this VM and then from there will jump to East Us DB Server VM.

Create a virtual machine

Validation passed

Basics Disks Networking Management Advanced Tags Review + create

ⓘ Cost given below is an estimate and not the final price. Please use [Pricing calculator](#) for all your Azure costs.

PRODUCT DETAILS

1 X Standard_B2ms

by Microsoft

[Terms of use](#) | [Privacy policy](#)

Subscription credits apply ⓘ

7.1901 INR/hr

[Pricing for other VM sizes](#)

TERMS

By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the above; (b) authorize Microsoft to bill my current payment method for the fees associated with billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact information with the provider(s) of the offering(s) for support, billing and other transactional a provide rights for third-party offerings. See the [Azure Marketplace Terms](#) for additional details

⚠ You have set RDP port(s) open to the internet. This is only recommended for testing. If you want to make your VM publicly accessible, you must enable a public IP address.

Create

< Previous

Next >

Download a template for Azure DevTest Labs

Now, 2nd VM

Create a virtual machine

Subscription * ⓘ

Resource group * ⓘ Create new

Instance details

Virtual machine name * ⓘ ✓

Region * ⓘ ⓘ

Availability options ⓘ ⓘ

Security type ⓘ ⓘ

Image * ⓘ ⓘ

See all images | Configure VM generation

VM architecture ⓘ Arm64 x64

ⓘ Arm64 is not supported with the selected image.

Run with Azure Spot discount ⓘ

Size * ⓘ ⓘ

Create a virtual machine ...

Basics Disks Networking Management 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 * [\(new\) vnetdbserverastus](#) [Create new](#)

Subnet * [dbserversubnet \(192.168.0.0/24\)](#) [Manage subnet configuration](#)

Public IP [\(new\) VMDBServer-ip](#) [\(new\) VMDBServer-ip](#)

NIC network security group [None](#) [Basic](#) [Advanced](#)

Public inbound ports * [None](#) [Allow selected ports](#)

Select inbound ports * [RDP \(3389\)](#)

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

No Public IP



Create a virtual machine ...

Basics Disks Networking Management 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 * [vnetdbserverastus](#) [Create new](#)

Subnet * [dbserversubnet \(192.168.0.0/24\)](#) [Manage subnet configuration](#)

Public IP [None](#) [Create new](#)

NIC network security group [None](#) [Basic](#) [Advanced](#)

Public inbound ports * [None](#) [Allow selected ports](#)

Select inbound ports * [RDP \(3389\)](#)

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

Create a virtual machine ...

Validation passed

Basics Disks Networking Management Advanced Tags Review + create

Cost given below is an estimate and not the final price. Please use [Pricing calculator](#) for all your pricing needs.

PRODUCT DETAILS

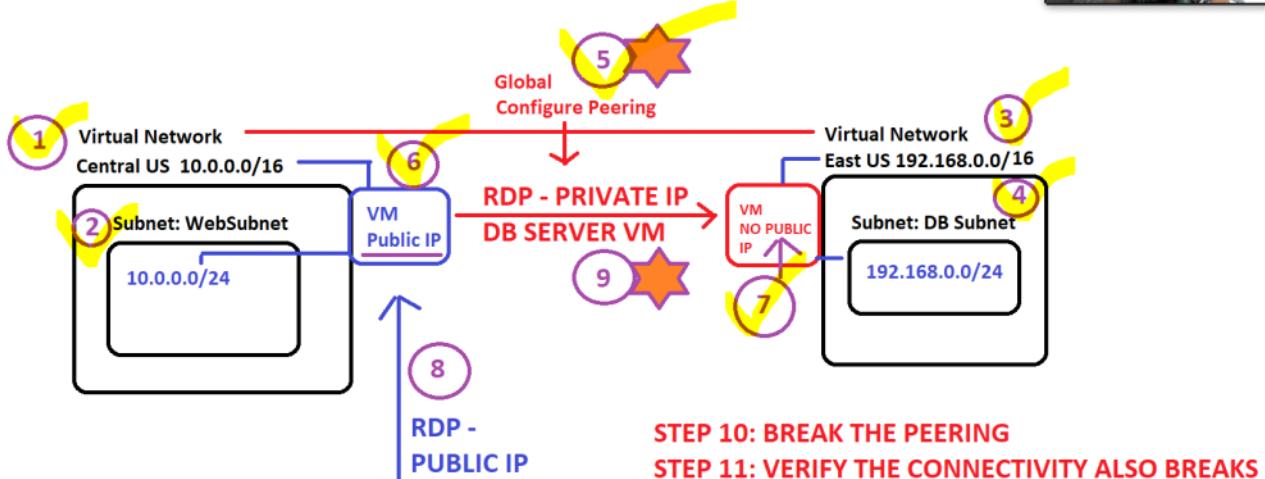
1 X Standard B2ms by Microsoft **5.9942 INR/hr** [Pricing for other VM sizes](#)

TERMS

By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not provide rights for third-party offerings. See the [Azure Marketplace Terms](#) for additional details.

⚠ You have set RDP port(s) open to the internet. This is only recommended for testing. If you want to change this setting

[Create](#) < Previous Next > Download a template for automation



Virtual machines ⚡ ...

Default Directory (talktorahuljoshioutlook.onmicrosoft.com)

+ Create Switch to classic Reservations Manage view Refresh Export to CSV Open query Assign tags Start Restart

Filter for any field... Subscription equals all Type equals all Resource group equals all Location equals all Add filter

No grouping

Name ↑↓	Type ↑↓	Subscription ↑↓	Resource group ↑↓	Location ↑↓	Status ↑↓	Operating system ↑
<input type="checkbox"/> VMDBServer	Virtual machine	MSDN Platforms	RG-DBSERVER-EASTUS	East US	Running	Windows
<input type="checkbox"/> VMWebServer	Virtual machine	MSDN Platforms	rg-webserver-centralus	Central US	Running	Windows

VMWebServer

Virtual machine

Search (Ctrl+ /)

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

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

MSDN Platforms Subscription ID ee7bab70-0709-4f4f-9829-790225dc5be4

Tags (edit) Click here to add tags

Properties Monitoring Capabilities (8) Recommendations Tutorials

Virtual machine

Computer name	VMWebServer
Health state	-
Operating system	Windows (Windows Server 2016 Datacenter)
Publisher	MicrosoftWindowsServer
Offer	WindowsServer
Plan	2016-datacenter-aensecond

Networking

Public IP address	20.29.122.41
Public IP address (IPv6)	-
Private IP address	10.0.0.4
Private IP address (IPv6)	-
Virtual network/subnet	vnetwebservercentralus/webserversubnet
DNS name	Configure

VMDBServer

Virtual machine

Search (Ctrl+ /)

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

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

MSDN Platforms Subscription ID ee7bab70-0709-4f4f-9829-790225dc5be4

Tags (edit) Click here to add tags

Properties Monitoring Capabilities (8) Recommendations Tutorials

Virtual machine

Computer name	VMDBServer
Health state	-
Operating system	Windows (Windows Server 2016 Datacenter)
Publisher	MicrosoftWindowsServer
Offer	WindowsServer
Plan	2016-datacenter-gensecond
VM generation	V2
VM architecture	x64

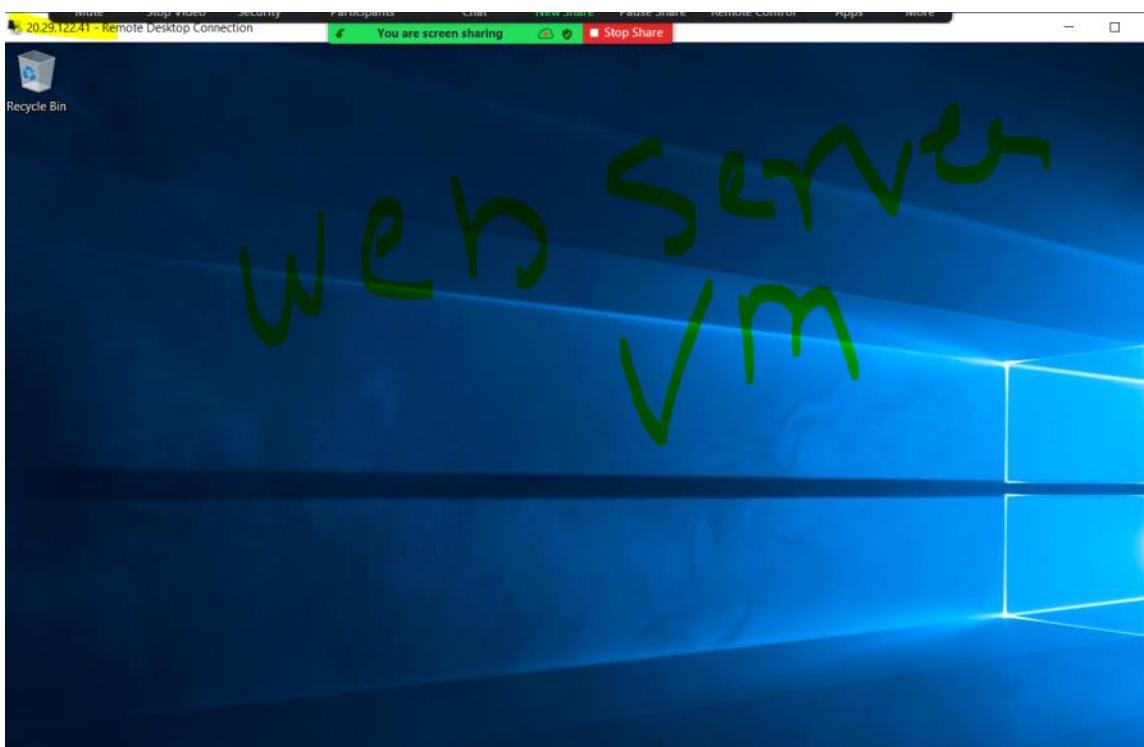
Networking

Public IP address	-
Public IP address (IPv6)	-
Private IP address	192.168.0.4
Private IP address (IPv6)	-
Virtual network/subnet	vnetdbservereastus/dbserversubnet
DNS name	Configure

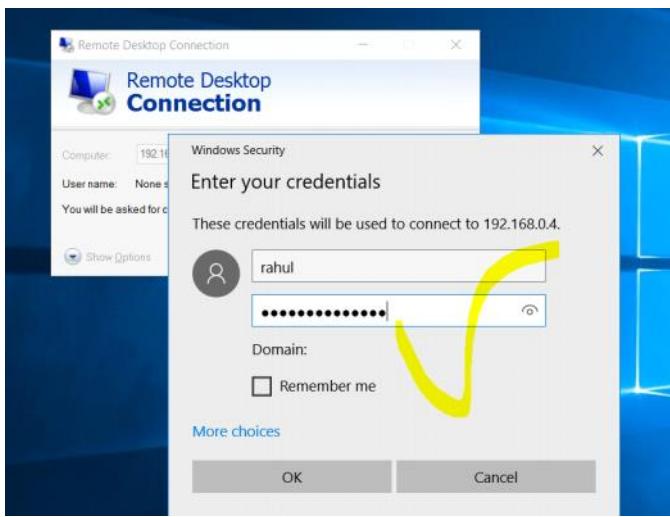
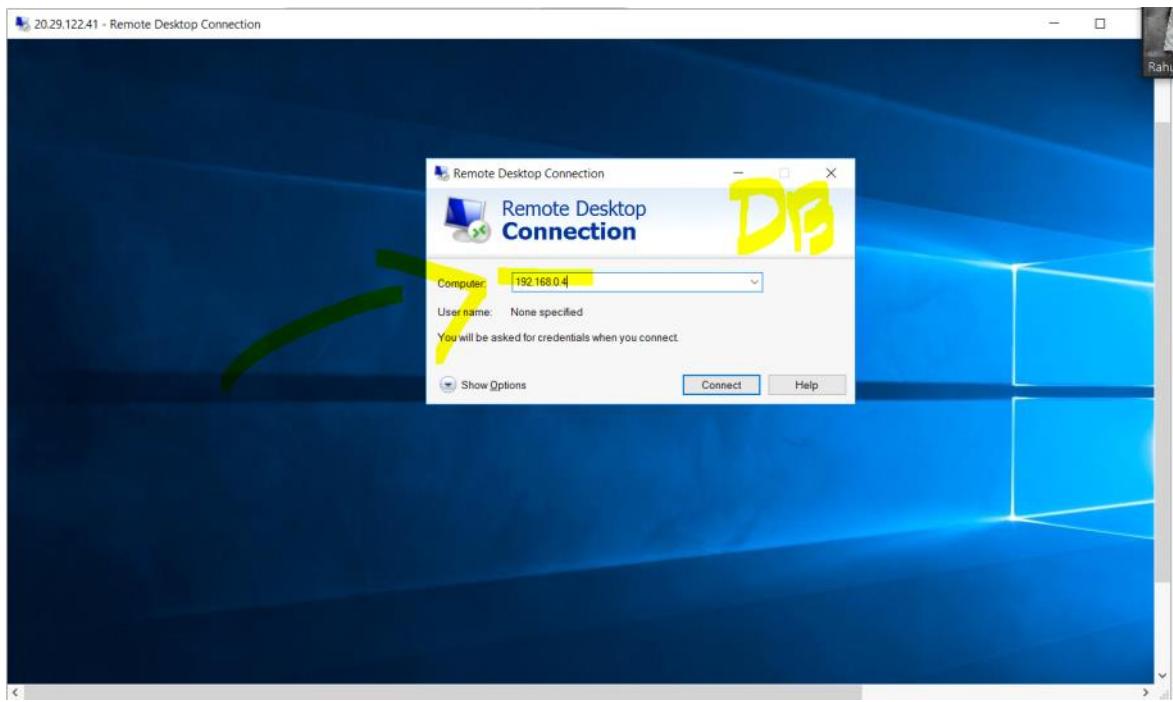
Size

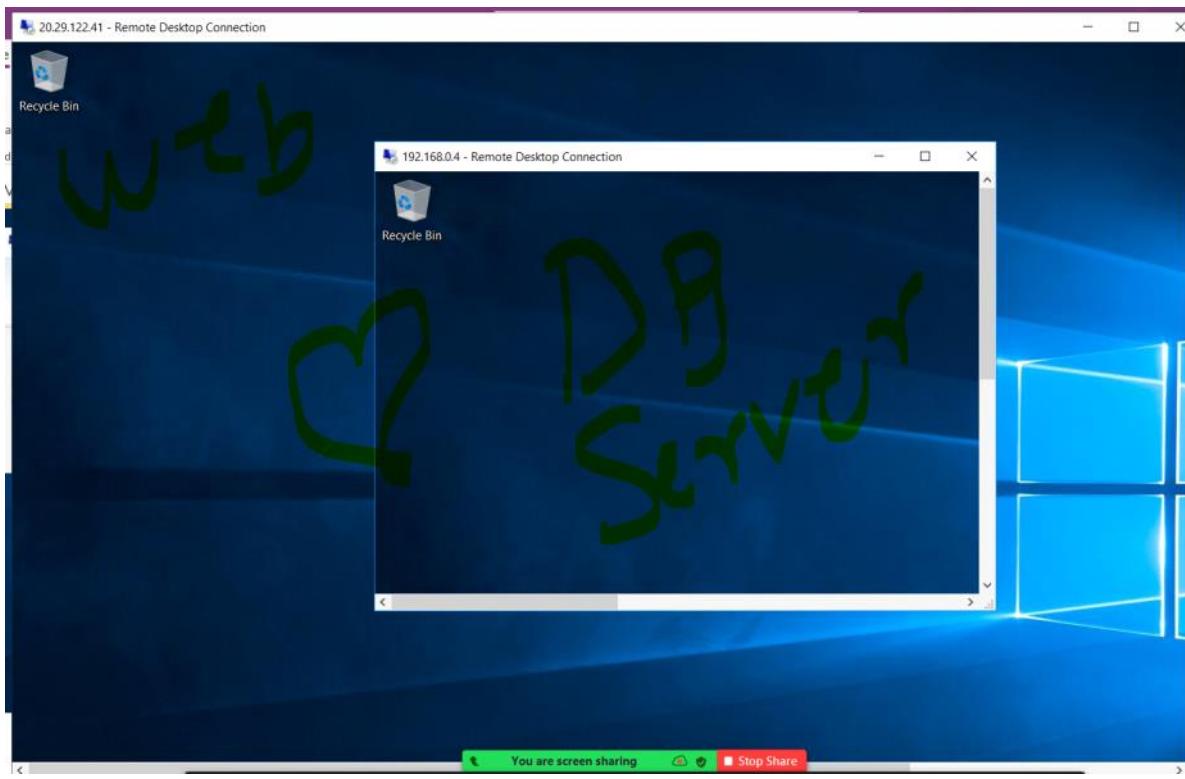
Size	Standard RS3mc
------	----------------

Now, let's RDP to the Web Server VM



Now, from the VM, try to RDP to the DB Server's Private IP





Break the Peering and see what happens inside the VM?

Home >

Virtual networks

Default Directory (talktorahuljoshioutlook.onmicrosoft.com)

+ Create Manage view Refresh Export to CSV Open query Assign tags

Filter for any field... Subscription equals all Resource group equals all Location equals all

Name	Resource group
vnetdbservereastus	rg-dbserver-eastus
vnetwebservicecentralus	rg-webserver-centralus

vnetwebservicecentralus | Peering

Virtual network

Address space

Connected devices

Subnets

Bastion

DDoS protection

Firewall

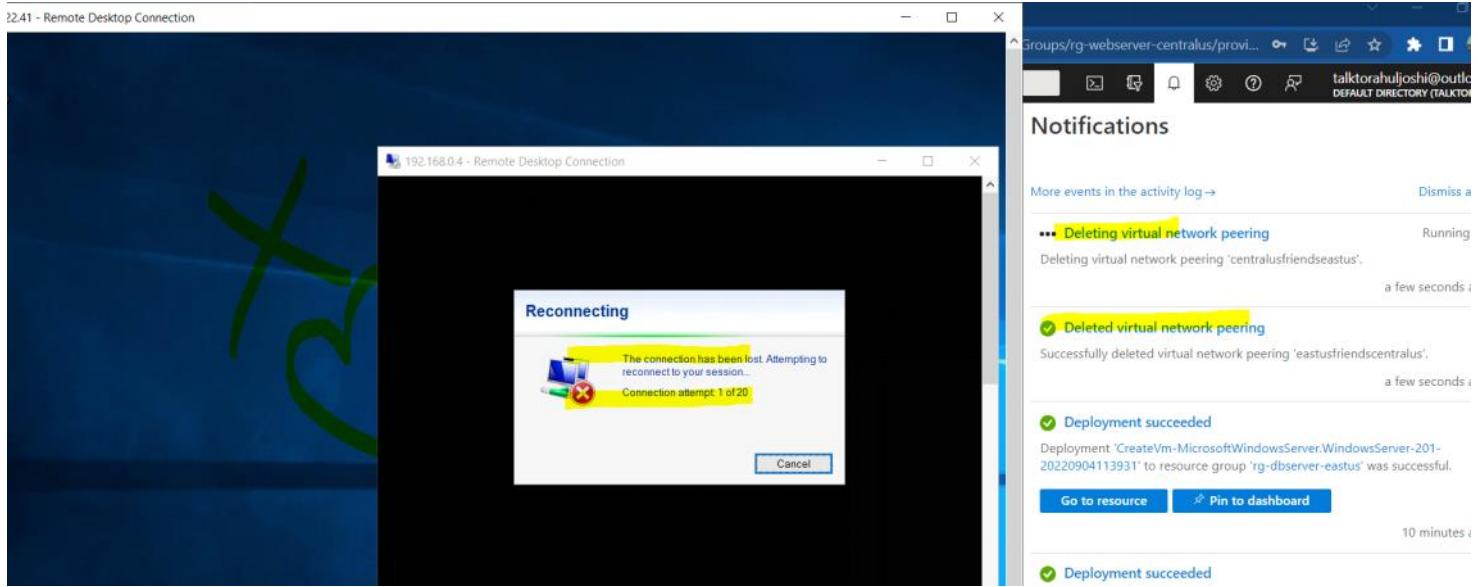
Microsoft Defender for Cloud

Network manager

Search (Ctrl+ /) Add Refresh Sync

Filter by name... Peering status == all

Name	Peering status	Peer	Gateway transit
centralusfriendseastus	Connected	vnetdbservereastus	Disable Delete



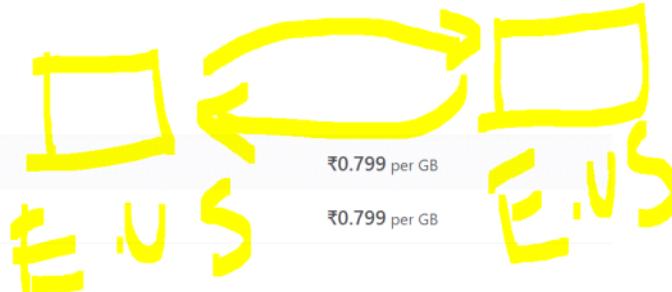
Most Important - Vnet Peering Pricing

<https://azure.microsoft.com/en-in/pricing/details/virtual-network/>

Virtual network peering links virtual networks, enabling you to route traffic between them using private IP addresses. Ingress and egress traffic is charged at both ends of the peered networks.

VNET Peering within the same region:

Inbound data transfer
Outbound data transfer



VNET Peering

	Zone 1	Zone 2	Zone 3	US Gov'
Inbound data transfer	₹2.796 per GB	₹7.190 per GB	₹12.782 per GB	₹3.515 per GB
Outbound data transfer	₹2.796 per GB	₹7.190 per GB	₹12.782 per GB	₹3.515 per GB

Which regions correspond to Zone 1, Zone 2, Zone 3 and US Gov?

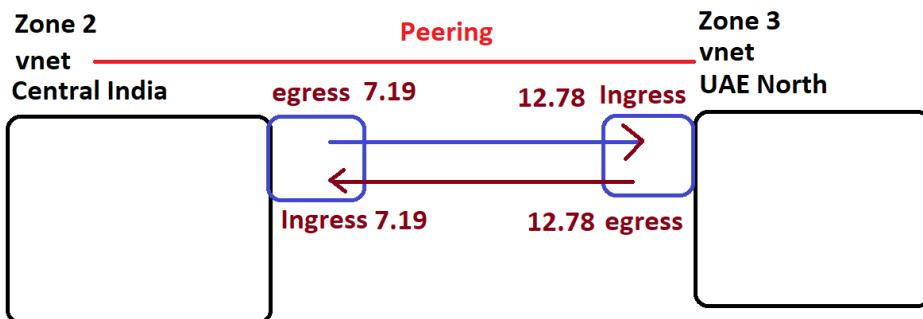
A sub-region is the lowest level geo-location which you may select to deploy your applications and associated data. For data transfers (except CDN), the following regions correspond to Zone 1, Zone 2 and Zone 3:

Zone 1—Australia Central, Australia Central 2, Canada Central, Canada East, Central US, East US, East US 2, France Central, France South, Germany North, Germany West Central, North Central US, North Europe, Norway East, Norway West, South Central US, Switzerland North, Switzerland West, UK South, UK West, West Central US, West Europe, West US, West US 2.

Zone 2—Australia East, Australia Southeast, Central India, East Asia, Japan East, Japan West, Korea Central, Korea South, Southeast Asia, South India, West India

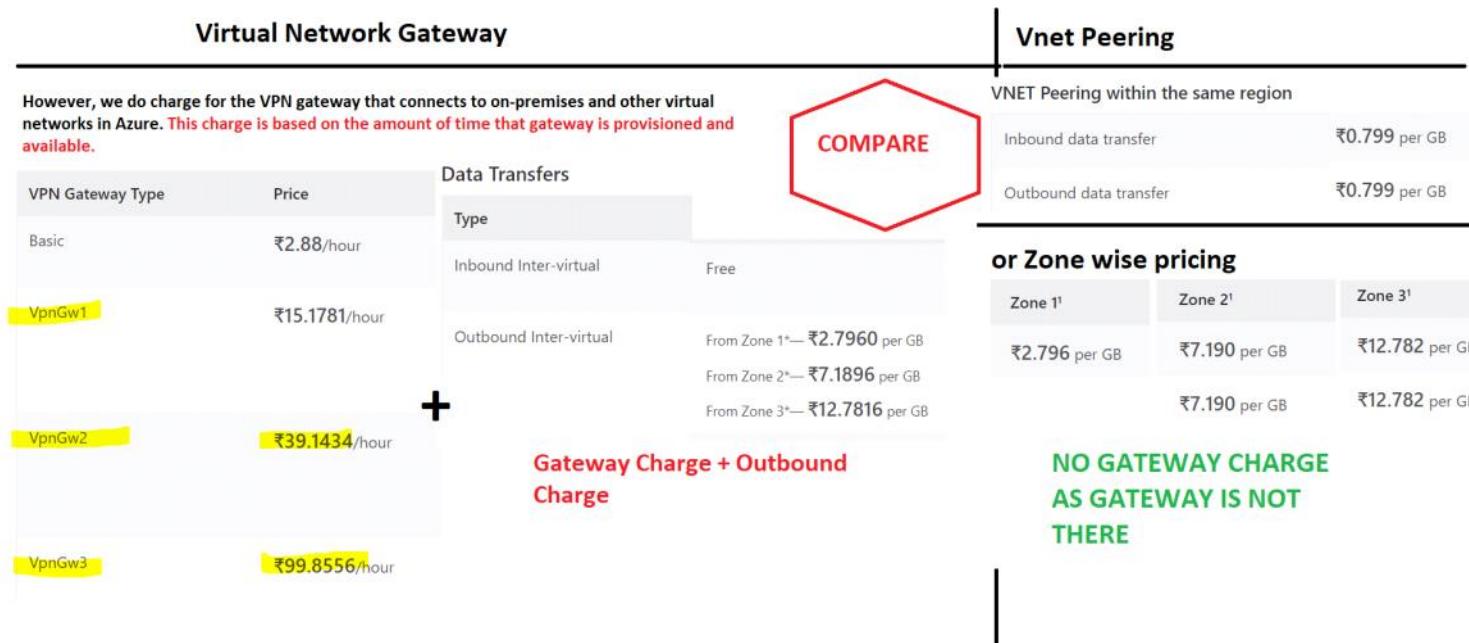
Zone 3—Brazil South, South Africa North, South Africa West, UAE Central, UAE North

US Gov—US Gov Arizona, US Gov Texas, US Gov Virginia



**YOU ARE BILLED NOT ONLY FOR
INCOMMING AND OUTGOING BUT
ALSO ZONE'S MAKE IT MORE
PROBLEM AS PRICES ARE DIFFERENT**

Price Compare between Virtual Network Gateway and Vnet Peering



There is no SLA for Vnet Peering as this uses Microsoft Backbone Internet
<https://azure.microsoft.com/en-in/support/legal/sla/>

But SLA is there for Virtual Network Gateway

SLA for VPN Gateway

Last updated: April 2019

We guarantee 99.9% availability for each Basic Gateway for VPN or Basic Gateway for ExpressRoute.

We guarantee 99.95% availability for all Gateway for VPN SKUs excluding Basic.

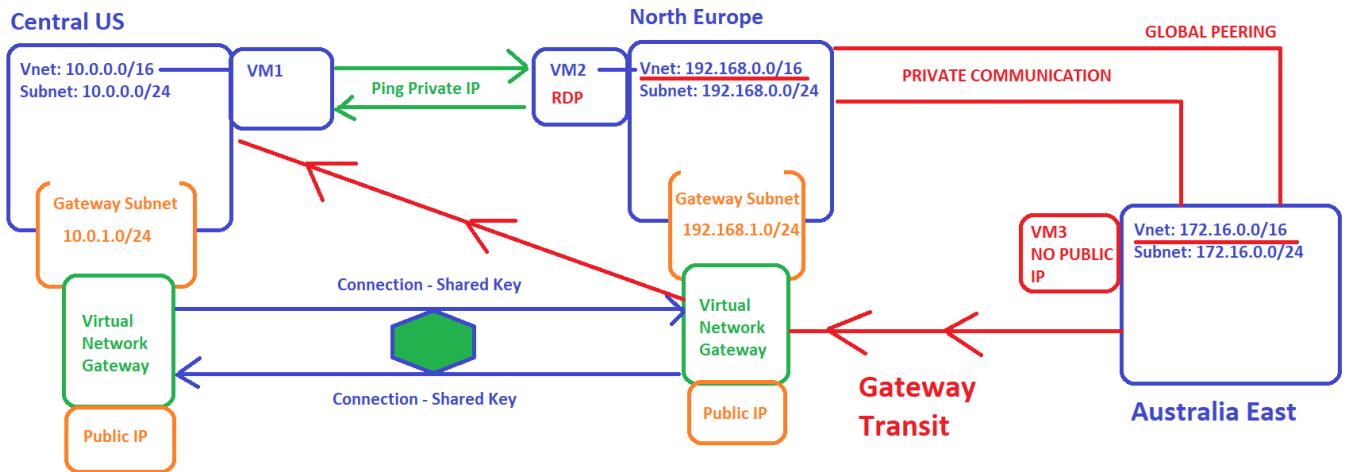
We guarantee 99.95% availability for all Gateway for ExpressRoute SKUs excluding Basic.

Introduction	▼
General Terms	▼
SLA details	▼

Case Study

The customer was very happy to see how Azure Vnet Peering can help and overcome the limitations and challenges associated with Virtual Network Gateway. As both Virtual Network Gateway and Peering are unique in their own ways, the customer wants to see a blended environment where we can use both Virtual Network Gateway and Vnet Peering and also "Cross Communication" in environments should

be possible.



Part 1

1st Vnet: Central US

Create virtual network ...

Basics IP Addresses Security 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 about virtual network](#)

Project details

Subscription *	MSDN Platforms
Resource group *	(New) rg-webserver-centralus
	Create new

Instance details

Name *	vnetwebservercentralus
Region *	Central US

Create virtual network ...

Basics **IP Addresses** Security Tags Review + create

The virtual network's address space, specified as one or more address prefixes in CIDR notation (e.g. 192.168.1.0/24).

IPv4 address space

10.0.0.0/16 10.0.0.0 - 10.0.255.255 (65536 addresses)

Add IPv6 address space

The subnet's address range in CIDR notation (e.g. 192.168.1.0/24). It must be contained by the address space of the virtual network.

+ Add subnet

Subnet name	Subnet address range	NAT gateway
<input type="checkbox"/> default	10.0.0.0/24	-

A NAT gateway is recommended for outbound internet access from subnets. Edit the subnet to add a NAT gateway. [Learn more](#)

Review + create < Previous Next : Security > Download a template for automation

2nd Vnet - North Europe

Create virtual network ...

Basics IP Addresses Security 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 about virtual network](#)

Project details

Subscription * MSDN Platforms

Resource group * (New) rg-dbserver-northeurope
[Create new](#)

Instance details

Name * vnetdbservernortheurope

Region * North Europe



Create virtual network ...

Basics **IP Addresses** Security Tags Review + create

The virtual network's address space, specified as one or more address prefixes in CIDR notation (e.g. 192.168.1.0/24).

IPv4 address space

192.168.0.0/16

Add IPv6 address space

The subnet's address range in CIDR notation (e.g. 192.168.1.0/24). It must be contained by the address space of the virtual network.

Add subnet Remove subnet

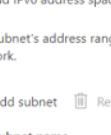
Subnet name Subnet address range NAT gateway

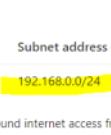
dbsubnet 192.168.0.0/24 -



































<img alt="Yellow checkmark indicating successful configuration of subnet address range

Create virtual network ...

Basics IP Addresses Security Tags Review + create

The virtual network's address space, specified as one or more address prefixes in CIDR notation (e.g. 192.168.1.0/24).

IPv4 address space

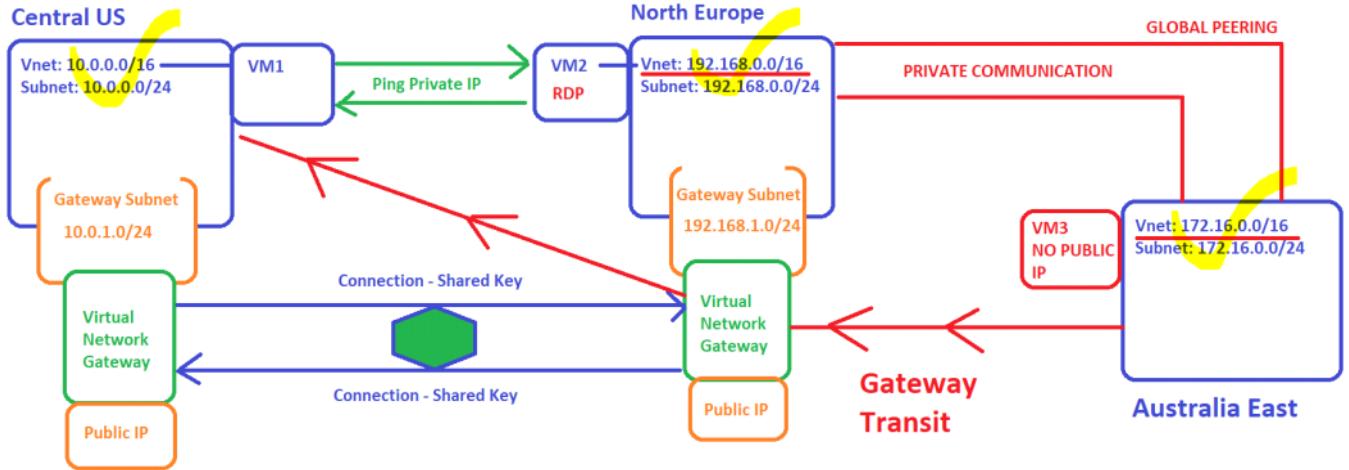
Add IPv6 address space ⓘ

The subnet's address range in CIDR notation (e.g. 192.168.1.0/24). It must be contained by the address space of the virtual network.

Add subnet

Subnet name Subnet address range NAT gateway

analyticsubnet



Virtual networks ⚙ ...

Default Directory (talktorahuljoshioutlook.onmicrosoft.com)



Name ↑

vnetanalyticsaustraliaeast

vnetdbservernortheurope

vnetwebservercentralus

Resource group ↑↓

rg-analytics-australiaeast

rg-dbserver-northeurope

rg-webserver-centralus

Location ↑↓

Australia East

North Europe

Central US

No grouping

Part II - Configure Vnet To Vnet between Central US and North Europe

vnetwebservercentralus | Subnets Subnet Gateway subnet Refresh Manage users

Search (Ctrl+ /)

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

Settings

- Address space
- Connected devices
- Subnets**
- Bastion
- DDoS protection
- Firewall
- Microsoft Defender for Cloud
- Network manager
- DNS servers
- Peerings
- Service endpoints
- Private endpoints

Add subnet

Name Copy to clipboard

Subnet address range * 10.0.1.0 - 10.0.1.255 (251 + 5 Azure reserved addresses)
 Add IPv6 address space

NAT gateway None

Network security group None

Route table None

SERVICE ENDPOINTS
Create service endpoint policies to allow traffic to specific Azure resources from your virtual network over service endpoints. [Learn more](#)

Services 0 selected

SUBNET DELEGATION

Save Cancel

vnetwebservercentralus | Subnets Subnet Gateway subnet Refresh Manage users Delete

Search (Ctrl+ /)

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

Settings

- Address space
- Connected devices
- Subnets**
- Bastion
- DDoS protection
- Firewall

Name	IPv4	IPv6	Available IPs	Delegated
default	10.0.0.0/24	-	251	-
GatewaySubnet	10.0.1.0/24	-	availability dependent ...	-

North Europe Vnet

Now, Virtual Network Gateway for Central US

Create virtual network gateway ...

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

Instance details

Name *

Region *

Gateway type * VPN ExpressRoute

VPN type * Route-based Policy-based

SKU *

Generation

Virtual network *

Subnet

Public IP Address Type * Basic Standard

Public IP address

Public IP address * Create new Use existing

Public IP address name *

Public IP address SKU

Assignment Dynamic Static

Enable active-active mode * Enabled Disabled

Configure BGP * Enabled Disabled

Azure recommends using a validated VPN device with your virtual network gateway. To view a list of validated devices and instructions for configuration, refer to [Azure's documentation](#) regarding validated VPN devices.

Review + create

[Previous](#)

[Next : Tags >](#)

[Download a template for automation](#)

Virtual Network Gateway for North Europe

Create virtual network gateway

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

Instance details

Name *

Region *

Gateway type * VPN ExpressRoute

VPN type * Route-based Policy-based

SKU *

Generation

Virtual network * [Create virtual network](#)

Subnet

Public IP address

Public IP address * Create new Use existing

Public IP address name *

Public IP address SKU Standard

Assignment Dynamic Static

Enable active-active mode * Enabled Disabled

Configure BGP * Enabled Disabled

Azure recommends using a validated VPN device with your virtual network gateway. To view a list of validated devices and instructions for configuration, refer to Azure's documentation regarding validated VPN devices.

[Review + create](#)

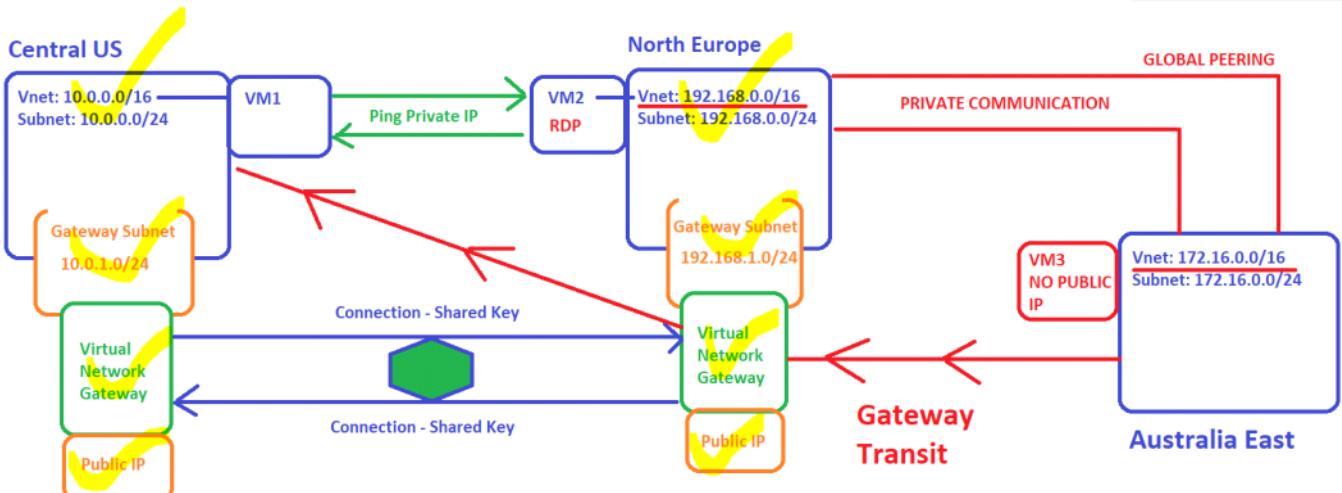
[Previous](#)

[Next >](#)

[Download a template for automation](#)

Notifications

- More events in the activity log →
- Dismiss a
- *** Deployment in progress... Running
Deployment to resource group 'rg-dbservnortheurope' is in progress.
a few seconds ↴
- *** Deployment in progress... Running
Deployment to resource group 'rg-webserver-centralus' is in progress.
2 minutes ↴



Part III

Virtual Machine in Central US - Public IP

Virtual Machine in North Europe - Public IP

Create a virtual machine ...

Subscription * rg-webserver-centralus

Resource group * rg-webserver-centralus

MSDN Platforms

Virtual machine name * vmwebserver

Region * (US) Central US

Availability options

Security type

Image * Windows Server 2016 Datacenter – Gen2

VM architecture Arm64 x64
Arm64 is not supported with the selected image.

Run with Azure Spot discount

Size * Standard_B2ms - 2 vcpus, 8 GiB memory (₹5,248.79/month)

Create a virtual machine ...

Basics Disks Networking Management 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 * vnetwebservercentralus

Create new

Subnet * default (10.0.0.0/24)

Manage subnet configuration

Public IP (new) vmwebserver-ip

Create new

NIC network security group None Basic Advanced

Public inbound ports * None Allow selected ports

Select inbound ports *

RDP (3389)

[Review + create](#)

< Previous

Next : Management >

Create a virtual machine

 Validation passed

Basics Disks Networking Management Advanced Tags Review + create

i Cost given below is an estimate and not the final price. Please use [Pricing calculator](#) for all your pricing needs.

PRODUCT DETAILS

1 X Standard B2ms

by Microsoft

[Terms of use](#) | [Privacy policy](#)

Subscription credits apply ⓘ

7.1901 INR/hr

Pricing for other VM sizes

TERMS

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⚠️ You have set RDP port(s) open to the internet. This is only recommended for testing. If you want to ch

[Create](#) [**< Previous**](#) [**Next >**](#) [Download a template for automation](#)

2nd VM in North Europe

Create a virtual machine

Subscription * 

Resource group * 

Instance details

Virtual machine name *  

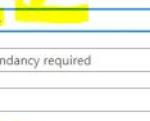
Region *  
 
 (Europe) North Europe

Availability options 

No infrastructure redundancy required

Security type 

Standard

Image *  
 
 Windows Server 2016 Datacenter – Gen2
[See all images](#) | [Configure VM generation](#)

VM architecture 

Arm64
 x64
 Arm64 is not supported with the selected image.

Run with Azure Spot discount 

Size * 

Standard_B2ms - 2 vcpus, 8 GiB memory (\$4.785,97/month)

Create a virtual machine ...

Basics Disks Networking Management 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 * [vnetdbservernortheurope](#) [Create new](#)

Subnet * [dbsubnet \(192.168.0.0/24\)](#) [Manage subnet configuration](#)

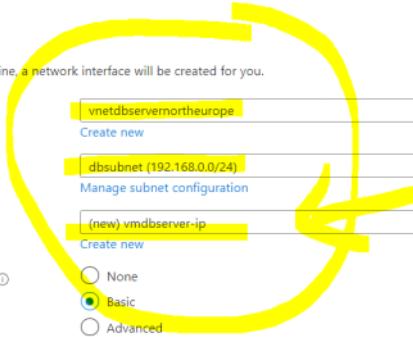
Public IP * [\(new\) vmdserver-ip](#) [Create new](#)

NIC network security group [None](#) [Basic](#) [Advanced](#)

Public inbound ports * [None](#) [Allow selected ports](#)

Select inbound ports * [RDP \(2389\)](#)

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




Create a virtual machine ...

 Validation passed

Basics Disks Networking Management Advanced Tags Review + create

 Cost given below is an estimate and not the final price. Please use [Pricing calculator](#) for all your pricing needs.

PRODUCT DETAILS

1 X Standard B2ms
by Microsoft
[Terms of use](#) | [Privacy policy](#)

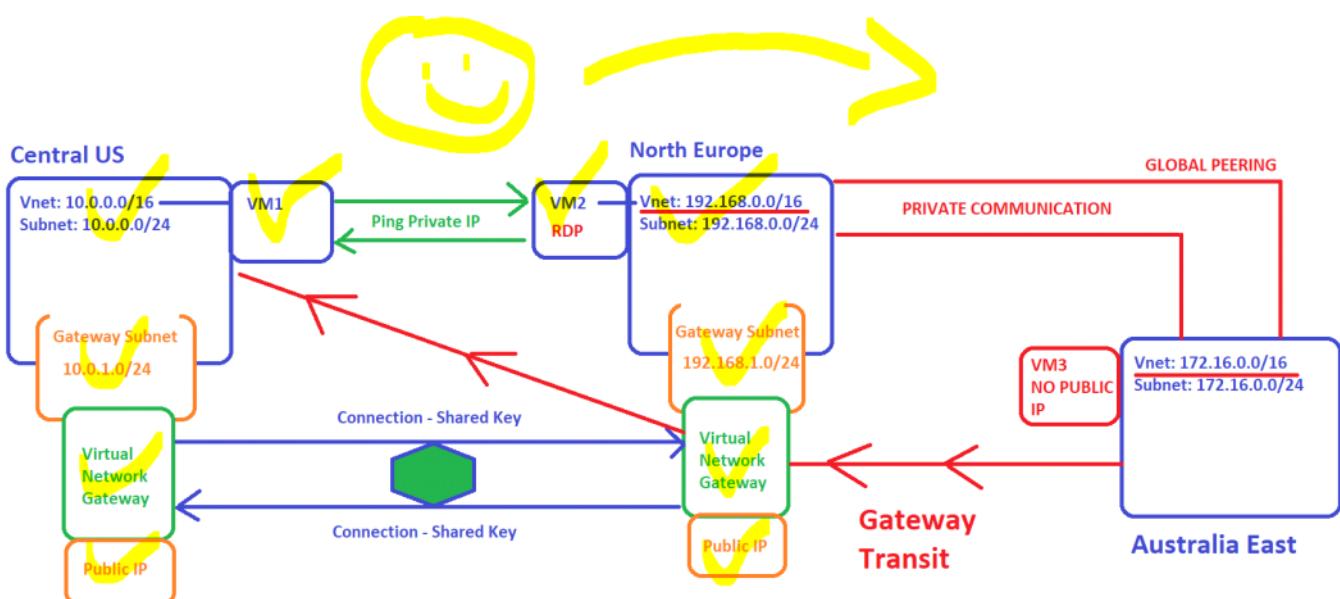
Subscription credits apply [\(i\)](#)
6.5561 INR/hr
[Pricing for other VM sizes](#)

TERMS

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 You have set RDP port(s) open to the internet. This is only recommended for testing. If you want to change this setting

[Create](#) [< Previous](#) [Next >](#) Download a template for automation



Part IV

Friendship (Peering) between North Europe Virtual Network and Australia East Virtual Network

Virtual networks ...

Default Directory (talktorahuljoshioutlook.onmicrosoft.com)

+ Create Manage view Refresh Export to CSV

Filter for any field... Subscription equals all Resource

Name	Peering Status
vnetanalyticaustraliaeast	Established
vnetdbservernortheurope	Established
vnetwebserververcentralus	Established

vnetdbservernortheurope | Peerings

Virtual network

Search (Ctrl+ /) Add Refresh Sync

Address space Connected devices Subnets Bastion DDoS protection Firewall Microsoft Defender for Cloud Network manager DNS servers Peerings Service endpoints Private endpoints

Filter by name... Peering status == all

Name	Peering status
Add a peering to get started	

Add peering ...

vnnetdbservernortheurope

For peering to work, two peering links must be created. By selecting remote virtual network, Azure will create the links.

This virtual network

Peering link name * noreuropfriendsaustralia

Traffic to remote virtual network Allow (default) Block all traffic to the remote virtual network

Traffic forwarded from remote virtual network Allow (default) Block traffic that originates from outside this virtual network

Virtual network gateway or Route Server Use this virtual network's gateway or Route Server Use the remote virtual network's gateway or Route Server None (default)

Add peering ...

vnetdbservernortheurope

Use this virtual network's gateway or Route Server
 Use the remote virtual network's gateway or Route Server
 None (default)

Remote virtual network
 Peering link name * australiafriendsnortheurope

Virtual network deployment model Resource manager
 Classic

I know my resource ID ⓘ

Subscription * ⓘ MSDN Platforms

Virtual network * vnetanalyticsaustraliaeast

Traffic to remote virtual network ⓘ
 Allow (default)
 Block all traffic to the remote virtual network

Traffic forwarded from remote virtual network ⓘ
 Allow (default)

Add

Home > Virtual networks > vnetdbservernortheurope

Rahul V Joshi

vnetdbservernortheurope | Peerings ⚡ ...

Virtual network

+ Add Refresh Sync

Address space		Peering status = all	Peer ↑↓	Gateway transit ↑↓
<input type="checkbox"/> Connected devices	<input type="checkbox"/> norneuropefriendsaustralia	Updating	vnetanalyticsaustraliaeast	Disabled
<input type="checkbox"/> Subnets				
<input type="checkbox"/> Bastion				
<input type="checkbox"/> DDoS protection				
<input type="checkbox"/> Firewall				
<input type="checkbox"/> Microsoft Defender for Cloud				

Part V

3rd Virtual Machine - Australia East - NO PUBLIC IP

Create a virtual machine ...

Subscription * ⓘ MSDN Platforms

Resource group * ⓘ rg-analytics-australiaeast

Virtual machine name * ⓘ vmanalytics

Region * ⓘ (Asia Pacific) Australia East

Availability options ⓘ No infrastructure redundancy required

Security type ⓘ Standard

Image * ⓘ Windows Server 2016 Datacenter - Gen2

VM architecture ⓘ x64
Arm64 is not supported with the selected image.

Run with Azure Spot discount ⓘ

Size * ⓘ Standard_B2ms - 2 vcpus, 8 GiB memory (\$5.574.86/month)

Create a virtual machine

Basics Disks Networking Management 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 *	vnetanalyticaustraliaeast	Create new
Subnet *	analyticssubnet (172.16.0.0/24)	Manage subnet configuration
Public IP	None	Create new
NIC network security group	<input type="radio"/> None	<input type="radio"/> None

Create a virtual machine

Validation passed

Basics Disks Networking Management Advanced Tags Review + create

[Cost given below is an estimate and not the final price. Please use \[Pricing calculator\]\(#\) for all your pricing needs](#)

PRODUCT DETAILS

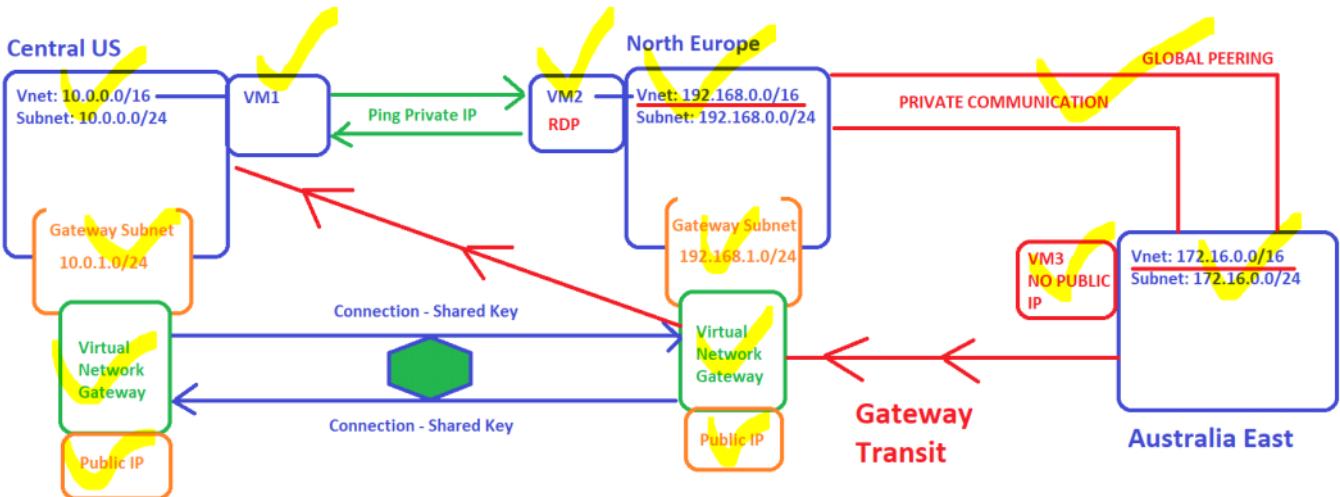
1 X Standard B2ms by Microsoft [Subscription credits apply](#) [7.6368 INR/hr](#) [Pricing for other VM sizes](#)

TERMS

By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s) billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft provides rights for third-party offerings. See the [Azure Marketplace Terms](#) for additional details.

[You have set RDP port\(s\) open to the internet. This is only recommended for testing. If you want to chan](#)

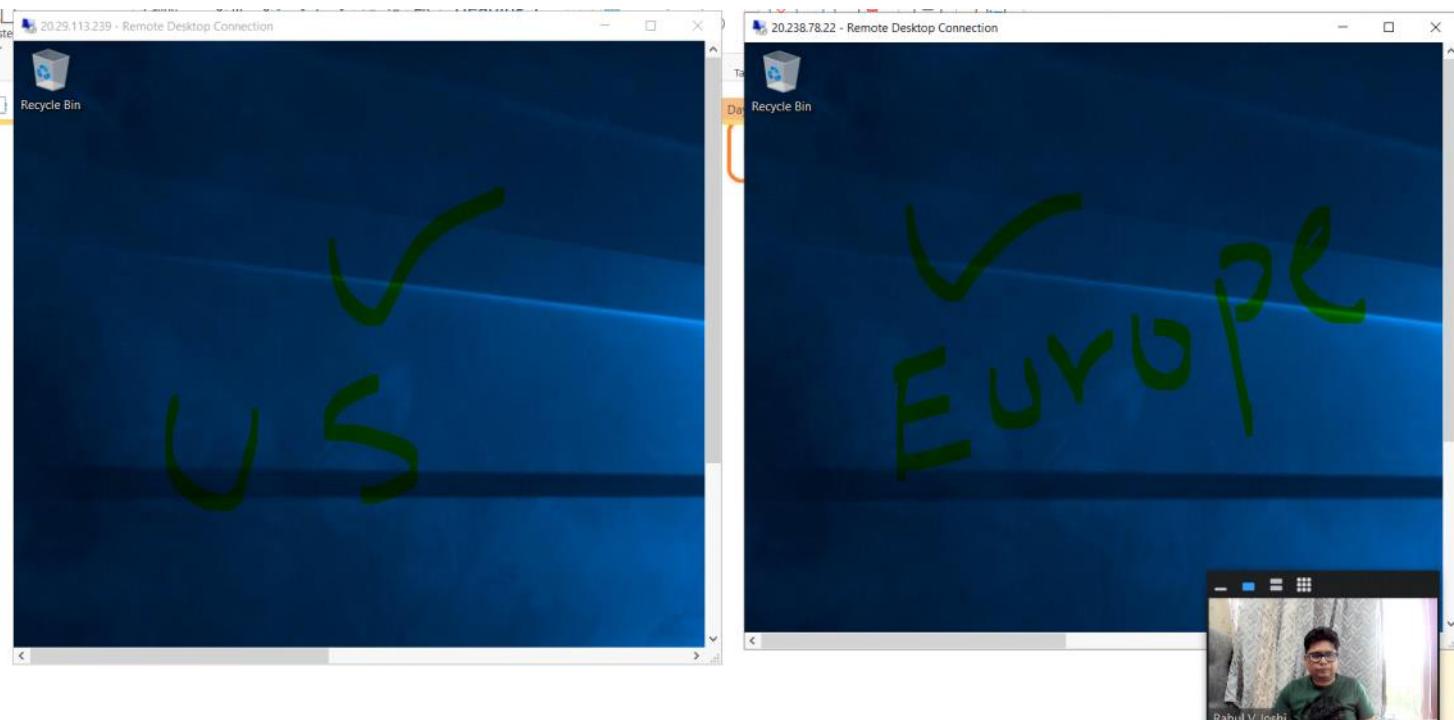
[Create](#) [< Previous](#) [Next >](#) [Download a template for automation](#)



Part VI

Login to Central US VM - Public IP

Login to North Europe VM - Public IP



New-NetFirewallRule -DisplayName "Allow ICMPv4-In" -Protocol ICMPv4

Administrator: Windows PowerShell	Administrator: Windows PowerShell
Windows PowerShell	Windows PowerShell
Copyright (C) 2016 Microsoft Corporation. All rights reserved.	Copyright (C) 2016 Microsoft Corporation. All rights reserved.
PS C:\Users\rahul> New-NetFirewallRule -DisplayName "Allow ICMPv4-In" -Protocol ICMPv4	PS C:\Users\rahul> New-NetFirewallRule -DisplayName "Allow ICMPv4-In" -Protocol ICMPv4
Name : {73d47f9a-cc61-4270-a9bb-84a56ffe8ca1}	Name : {9bdc2eba-75d6-49e9-ba24-0cd543ff09a5}
Displayname : Allow ICMPv4-In	Displayname : Allow ICMPv4-In
Description :	Description :
DisplayGroup :	DisplayGroup :
Group :	Group :
Enabled : True	Enabled : True
Profile : Any	Profile : Any
Platform : {}	Platform : {}
Direction : Inbound	Direction : Inbound
Action : Allow	Action : Allow
EdgeTraversalPolicy : Block	EdgeTraversalPolicy : Block
LooseSourceMapping : False	LooseSourceMapping : False
LocalOnlyMapping : False	LocalOnlyMapping : False
Owner :	Owner :
PrimaryStatus : OK	PrimaryStatus : OK
Status : The rule was parsed successfully from the store. (65536)	Status : The rule was parsed successfully from the store. (65536)
EnforcementStatus : NotApplicable	EnforcementStatus : NotApplicable
PolicyStoreSource : PersistentStore	PolicyStoreSource : PersistentStore
PolicyStoreSourceType : Local	PolicyStoreSourceType : Local

Administrator: Windows PowerShell	Administrator: Windows PowerShell
Windows PowerShell	Windows PowerShell
Copyright (C) 2016 Microsoft Corporation. All rights reserved.	Copyright (C) 2016 Microsoft Corporation. All rights reserved.
PS C:\Users\rahul> ipconfig	PS C:\Users\rahul> ipconfig
Windows IP Configuration	Windows IP Configuration
Ethernet adapter Ethernet:	Ethernet adapter Ethernet:
Connection-specific DNS Suffix . : otpkc4aoxzeexh3lfxzy011td.gx.internal.cloudapp.net	Connection-specific DNS Suffix . : kwql2rxzohxerotpgd4b4qj15d.fx.internal.cloudapp.net
Link-Local IPv6 Address : fe80::b400:e573:cc2c:2796%5	Link-Local IPv6 Address : fe80::fc15:9acd:ffb1:9c37%
IPv4 Address : 10.0.0.4	IPv4 Address : 192.168.0.4
Subnet Mask : 255.255.255.0	Subnet Mask : 255.255.255.0
Default Gateway : 10.0.0.1	Default Gateway : 192.168.0.1
Tunnel adapter isatap.otpkc4aoxzeexh3lfxzy011td.gx.internal.cloudapp.net:	Tunnel adapter isatap.kwql2rxzohxerotpgd4b4qj15d.fx.internal.cloudapp.net:
Media State : Media disconnected	Media State : Media disconnected
Connection-specific DNS Suffix . : otpkc4aoxzeexh3lfxzy011td.gx.internal.cloudapp.net	Connection-specific DNS Suffix . : kwql2rxzohxerotpgd4b4qj15d.fx.internal.cloudapp.net
Tunnel adapter Teredo Tunneling Pseudo-Interface:	Tunnel adapter Teredo Tunneling Pseudo-Interface:
Connection-specific DNS Suffix . : 2001:0:34f1:8072:20bc:1ed:f5ff:ffff	Connection-specific DNS Suffix . : 2001:0:2851:782c:1847:3b13:3f57:ffff
IPv6 Address : fe80::20bc:1ed:f5ff:ffff%3	Link-local IPv6 Address : fe80::1847:3b13:3f57:ffff%8
Default Gateway :	Default Gateway :

Notifications

More events in the activity log → Dismiss all

Deployment succeeded Deployment 'Microsoft.VirtualNetworkGateway/20220904141404' to resource group 'rg-dserver-northeurope' was successful.

Go to resource Pin to dashboard a few seconds ago

Deployment succeeded Deployment 'Microsoft.VirtualNetworkGateway/20220904141153' to resource group 'rg-webserver-centralus' was successful.

Go to resource Pin to dashboard 2 minutes ago

Part VII

Create Connection between Central US To North Europe and then North Europe To Central US

vngwebservercentralus | Connections

Virtual network gateway

Search (Ctrl+ /) + Add Refresh

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

Settings Configuration Connections Point-to-site configuration Properties

Add connection vngwebservercentralus

Name * centralustonortheurope

Connection type VNet-to-VNet

*First virtual network gateway vngwebservercentralus

*Second virtual network gateway vngdbservernortheurope

Shared key (PSK) * Welcome@123456

Use Azure Private IP Address

Enable BGP

IKE Protocol IKEv1 IKEv2

Subscription MSDN Platforms

Resource group vngwebservercentralus

OK

Add connection ...

vngdbservernortheurope

Name *

Connection type VNet-to-VNet VNet-to-Subnet

*First virtual network gateway vngdbservernortheurope

*Second virtual network gateway vngwebservercentralus

Shared key (PSK) *

Use Azure Private IP Address

Enable BGP

IKE Protocol IKEv1 IKEv2

Subscription MSDN Platforms

Resource group

OK

```

Administrator: Windows PowerShell
Status : The rule was parsed successfully from the store. (65536)
EnforcementStatus : NotApplicable
PolicyStoreSource : PersistentStore
PolicyStoreSourceType : Local

ps C:\Users\rahul>
ps C:\Users\rahul> ipconfig
Windows IP Configuration

Ethernet adapter Ethernet:
  Connection-specific DNS Suffix . : otpkc4aoxzeexh3lfxzy011td.gx.internal.cloudapp.net
  Link-local IPv6 Address . . . . . : fe80::b400:e573:cc2c:2796%6
  IPv4 Address . . . . . : 10.0.0.4
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : 10.0.0.1

Tunnel adapter isatap.otpkc4aoxzeexh3lfxzy011td.gx.internal.cloudapp.net:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . . . . . : otpkc4aoxzeexh3lfxzy011td.gx.internal.cloudapp.net

Tunnel adapter Teredo Tunneling Pseudo-Interface:
  Connection-specific DNS Suffix . . . . . :
  IPv6 Address . . . . . : 2001:0:34f1:8072:20bc:1ed:f5ff:ffff
  Link-local IPv6 Address . . . . . : fe80::20bc:1ed:f5ff:ffff%3
  Default Gateway . . . . . : ::

ps C:\Users\rahul> ping 192.168.0.4 /t
Pinging 192.168.0.4 with 32 bytes of data:
Reply from 192.168.0.4: bytes=32 time=92ms TTL=128
Reply from 192.168.0.4: bytes=32 time=91ms TTL=128
Reply from 192.168.0.4: bytes=32 time=92ms TTL=128
Reply from 192.168.0.4: bytes=32 time=91ms TTL=128
Reply from 192.168.0.4: bytes=32 time=165ms TTL=128
Reply from 192.168.0.4: bytes=32 time=105ms TTL=128
Reply from 192.168.0.4: bytes=32 time=89ms TTL=128
Reply from 192.168.0.4: bytes=32 time=155ms TTL=128
Reply from 192.168.0.4: bytes=32 time=125ms TTL=128
Reply from 192.168.0.4: bytes=32 time=93ms TTL=128
Reply from 192.168.0.4: bytes=32 time=130ms TTL=128

20.29.113.239 - Remote Desktop Connection
Administrator: Windows PowerShell
Status : The rule was parsed successfully from the store. (65536)
EnforcementStatus : NotApplicable
PolicyStoreSource : PersistentStore
PolicyStoreSourceType : Local

PS C:\Users\rahul>
PS C:\Users\rahul> ipconfig
Windows IP Configuration

Ethernet adapter Ethernet:
  Connection-specific DNS Suffix . . . . . : kwql2rxzohxerotpgd4b4qj15d.fx.internal.cloudapp.net
  Link-local IPv6 Address . . . . . : fe80::f1c5:9acd:ffbb:19c3%2
  IPv4 Address . . . . . : 192.168.0.4
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : 192.168.0.1

Tunnel adapter isatap.kwql2rxzohxerotpgd4b4qj15d.fx.internal.cloudapp.net:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . . . . . : kwql2rxzohxerotpgd4b4qj15d.fx.internal.cloudapp.net

Tunnel adapter Teredo Tunneling Pseudo-Interface:
  Connection-specific DNS Suffix . . . . . :
  IPv6 Address . . . . . : 2001:0:2851:782c:1847:3b13:3f57:fe80::1847:3b13:3f57:ffff%8
  Link-local IPv6 Address . . . . . : fe80::1847:3b13:3f57:ffff%8
  Default Gateway . . . . . : ::

PS C:\Users\rahul> ping 10.0.0.4 /t

```

Part VIII

Now, Connect from Europe VM to the VM of Australia East (PRIVATE IP)

vmanalytics Virtual machine

Search (Ctrl+ /)

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

Properties Monitoring Capabilities (8) Recommendations Tutorials

Virtual machine

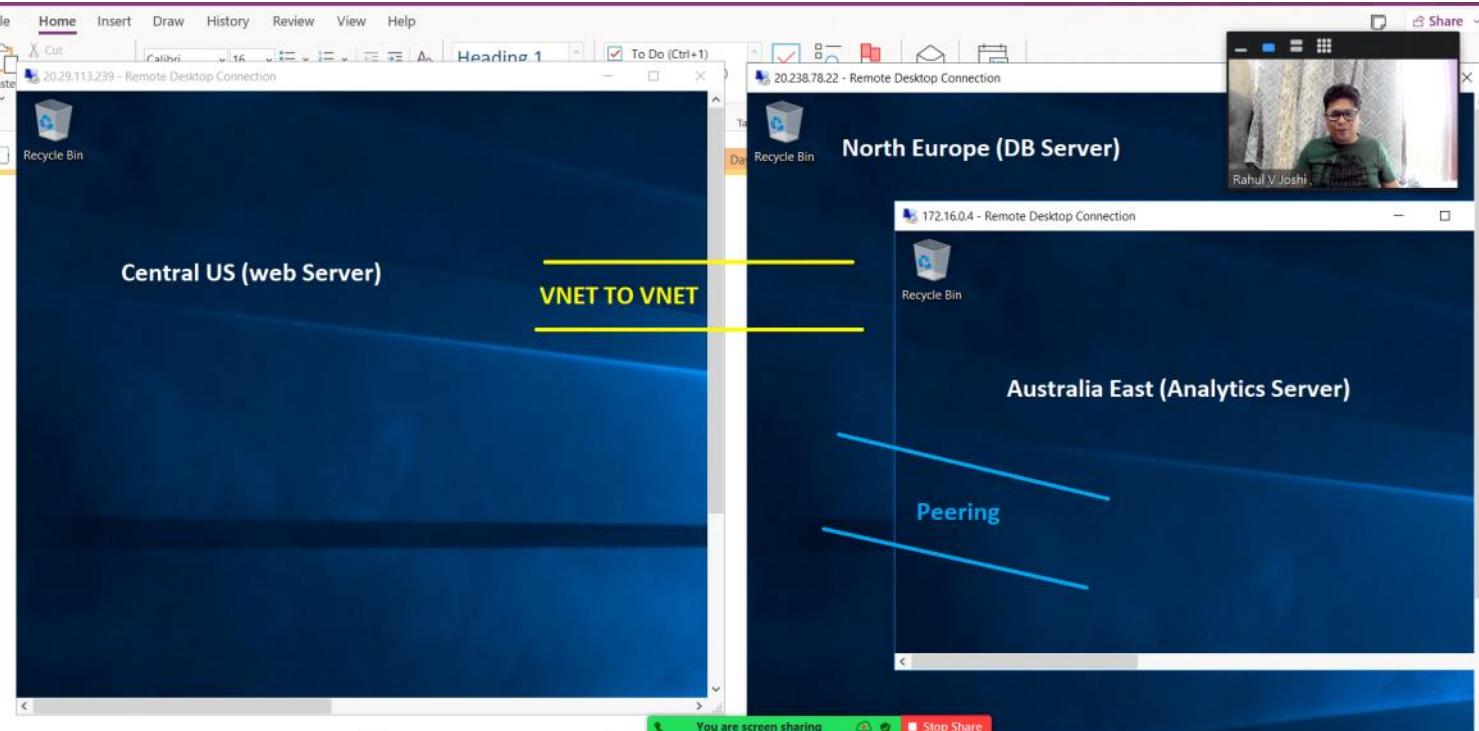
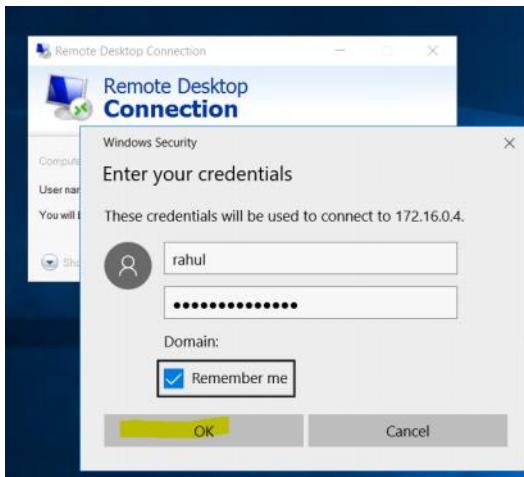
Computer name	vmanalytics
Health state	-
Operating system	Windows (Windows Server 2016 Datacenter)
Publisher	MicrosoftWindowsServer
Offer	WindowsServer
Plan	2016-datacenter-gensecond
VM generation	V2
VM architecture	x64
Agent status	Ready

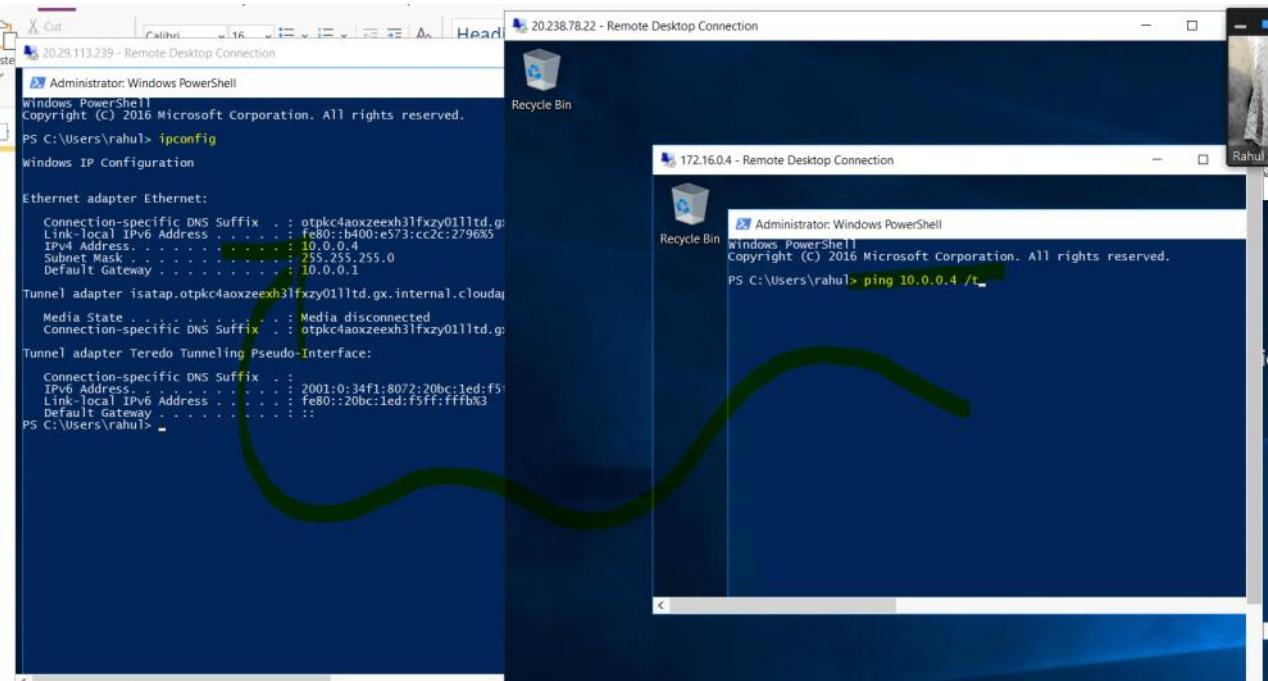
Networking

Public IP address	-
Private IP address (IPv6)	-
Private IP address (IPv4)	172.16.0.4
Virtual network/subnet	vnetanalyticsaustraliaeast/analyticssubnet
DNS name	Configure

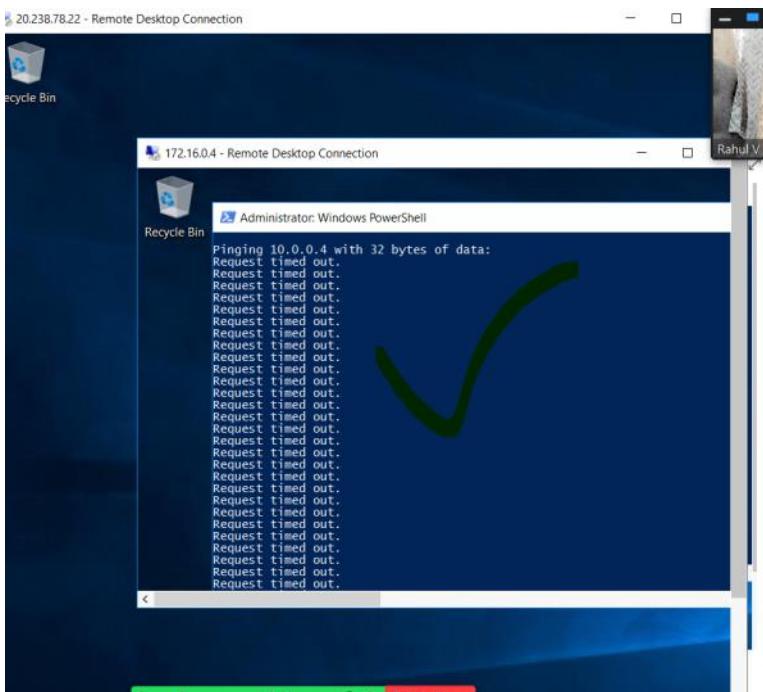
Size

Size	Standard B2ms
------	---------------





We can see very clearly below, ping is not happening from Australia To Central US as they do not each other



So, to solve this problem, we go to Peering Option between North Europe and Australia East

Virtual networks ...

Default Directory (talktorahuljoshioutlook.onmicrosoft.com)

+ Create Manage view Refresh Export to CSV Open query

Filter for any field... Subscription equals all Resource group equals all

<input type="checkbox"/> Name ↑↓	F
<input type="checkbox"/> vnetanalyticsaustraliaeast	r
<input type="checkbox"/> vnetdbservernortheurope	r
<input type="checkbox"/> vnetwebservercentralus	r

vnetdbservernortheurope | Peerings

Virtual network

+ Add Refresh Sync

Address space

Connected devices

Subnets

Bastion

DDoS protection

Firewall

Microsoft Defender for Cloud

Filter by name... Peering status == all

Name ↑↓	Peering status ↑↓	Peer ↑↓	Gateway transit ↑↓
northeastfriendsaustralia	Connected	vnetanalyticsaustraliaeast	Disabled

northeastfriendsaustralia

vnetdbservernortheurope

This virtual network

Peering link name

northeastfriendsaustralia

Peering status

Fully Synchronized

Peering state

Succeeded

Traffic to remote virtual network

Allow (default)

Block all traffic to the remote virtual network

Traffic forwarded from remote virtual network

Allow (default)

Block traffic that originates from outside this virtual network

Virtual network gateway or Route Server

Use this virtual network's gateway or Route Server

Use the remote virtual network's gateway or Route Server

None (default)

Remote virtual network

Remote Vnet Id

Save Cancel



vnetdbservernortheurope | Peerings

Virtual network

+ Add Refresh Sync

Address space

Connected devices

Subnets

Bastion

DDoS protection

Firewall

Microsoft Defender for Cloud

Network manager

DNS servers

Peering

Service endpoints

Private endpoints

...

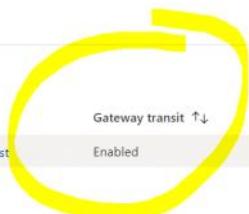
Filter by name... Peering status == all

Name ↑↓ Peering status ↑↓ Peer ↑↓

northeastfriendsaustralia Updating vnetanalyticsaustraliaeast

Gateway transit ↑↓

Enabled



Enable Gateway Transit In other Region also of Australia East

vnetanalyticsaustraliaeast | Peerings

Virtual network

+ Add Refresh Sync

Address space

Connected devices

Subnets

Bastion

DDoS protection

Firewall

Microsoft Defender for Cloud

Network manager

DNS servers

Peering

Service endpoints

Private endpoints

...

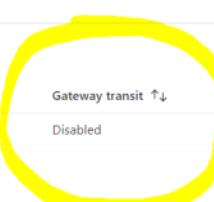
Filter by name... Peering status == all

Name ↑↓ Peering status ↑↓ Peer ↑↓

australiabuddiesnortheurope Connected vnetdbservernortheurope

Gateway transit ↑↓

Disabled



australiafriendsnortheurope

vnetanalyticaustraliaeast

Peering status

Fully Synchronized

Peering state

Succeeded

Traffic to remote virtual network

Allow (default)

Block all traffic to the remote virtual network

Traffic forwarded from remote virtual network

Allow (default)

Block traffic that originates from outside this virtual network

Virtual network gateway or Route Server

Use this virtual network's gateway or Route Server

Use the remote virtual network's gateway or Route Server

None (default)

Remote virtual network

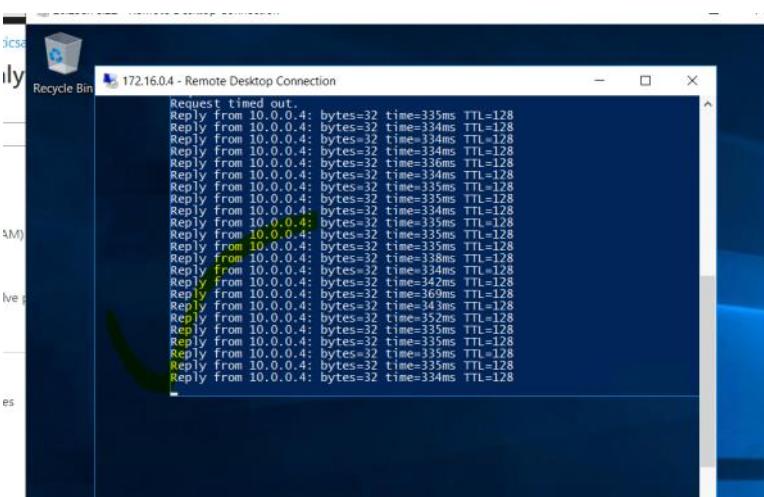
Remote Vnet Id

/subscriptions/ee7bab70-0709-4f4f-9829-790225dc5be4/resourceGroups/rg-dbserver-northeu

Address space

192.168.0.0/16

Save **Cancel**



```
PS C:\Users\rahul> ipconfig
Windows IP Configuration

Ethernet adapter Ethernet:
  Connection-specific DNS Suffix . : otpkc4aoxzeexh3lfxzy011td.gx.internal.cloudapp.net
  Link-local IPv6 Address . . . . . : fe80::d400:e573:cc2c:296%5
  IPv4 Address . . . . . : 10.0.0.1
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : 10.0.0.1

Tunnel adapter isatap.otpkc4aoxzeexh3lfxzy011td.gx.internal.cloudapp.net:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . . . . . : otpkc4aoxzeexh3lfxzy011td.gx.internal.cloudapp.net

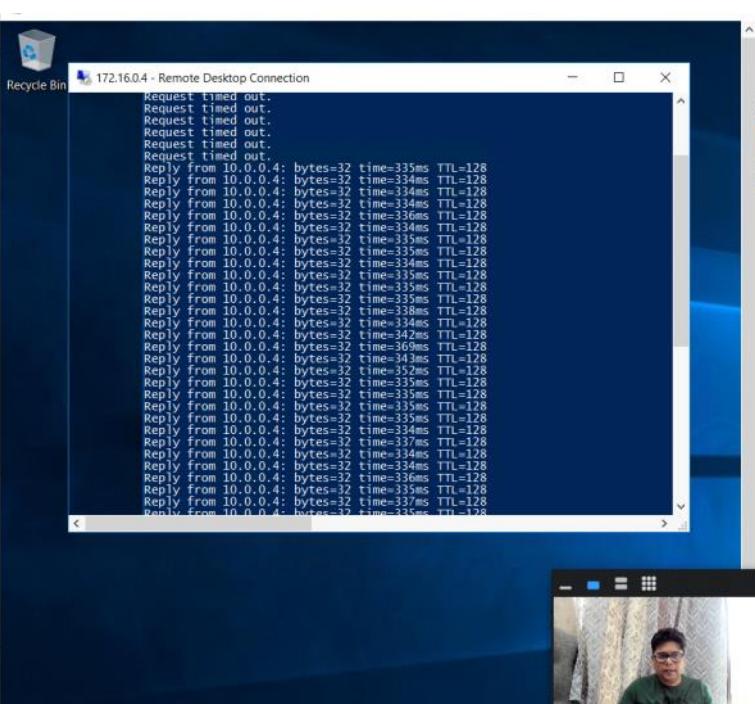
Tunnel adapter Teredo Tunneling Pseudo-Interface:
  Connection-specific DNS Suffix . . . . . : 2001:0:34f1:8072:20bc:led:f5ff:ffff
  IPv6 Address . . . . . : fe80::b400:e573:cc2c:2796%3
  Default Gateway . . . . . : ::

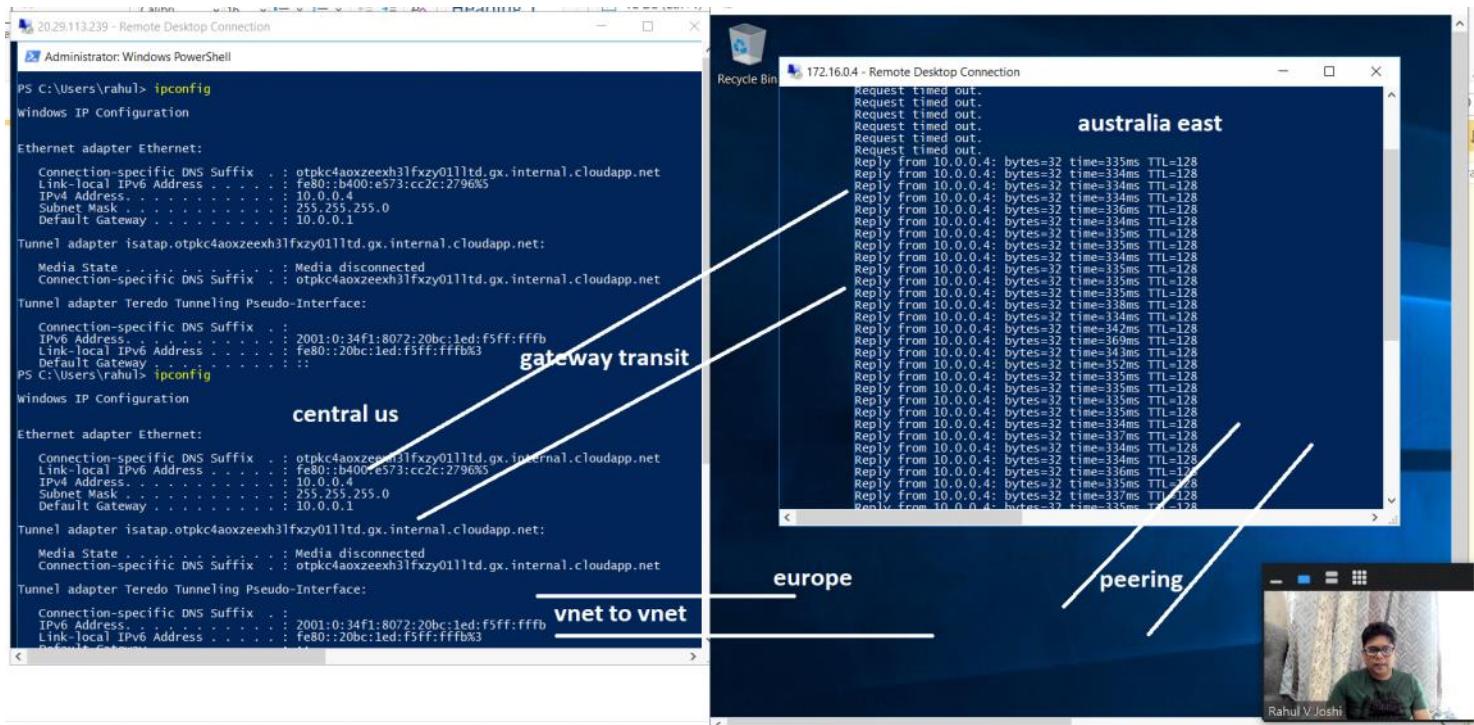
PS C:\Users\rahul> ipconfig
Windows IP Configuration

Ethernet adapter Ethernet:
  Connection-specific DNS Suffix . . . . . : otpkc4aoxzeexh3lfxzy011td.gx.internal.cloudapp.net
  Link-local IPv6 Address . . . . . : fe80::d400:e573:cc2c:2796%5
  IPv4 Address . . . . . : 10.0.0.4
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : 10.0.0.1

Tunnel adapter isatap.otpkc4aoxzeexh3lfxzy011td.gx.internal.cloudapp.net:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . . . . . : otpkc4aoxzeexh3lfxzy011td.gx.internal.cloudapp.net

Tunnel adapter Teredo Tunneling Pseudo-Interface:
  Connection-specific DNS Suffix . . . . . : 2001:0:34f1:8072:20bc:led:f5ff:ffff
  IPv6 Address . . . . . : fe80::b400:e573:cc2c:2796%3
  Default Gateway . . . . . : ::
```





Delete All the Resource Group as it can to cost, it can take 15-20 mins