

## About Rahul Joshi:

22 Years exp, 15<sup>th</sup> 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:

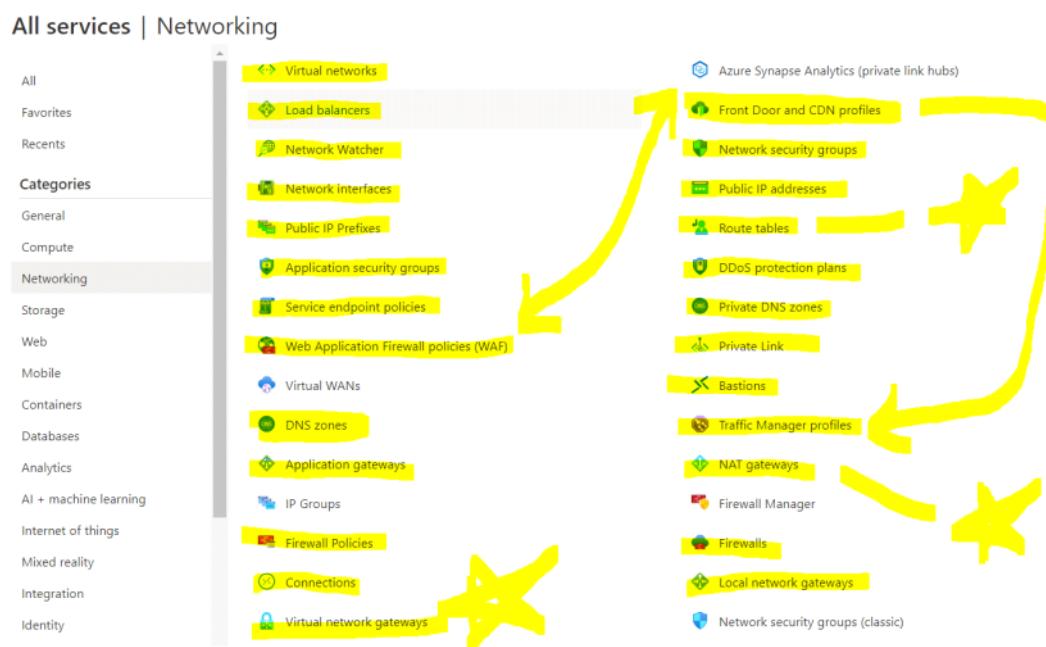
[https://drive.google.com/drive/folders/181ebdbVLk5xpLu5ArR\\_BFWeM9b3N2x3?usp=sharing](https://drive.google.com/drive/folders/181ebdbVLk5xpLu5ArR_BFWeM9b3N2x3?usp=sharing)

**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.

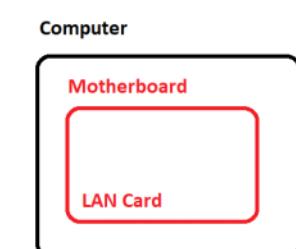
One Note Documentation:

One Note Documentation: <https://1drv.ms/u/s!Aht-oGEG3XwWgagv2dn7HuXOmk0wg>

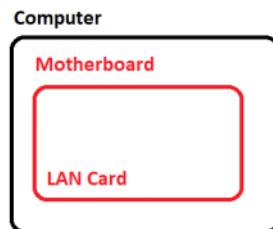
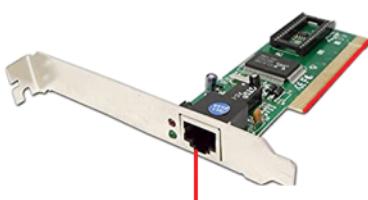
Networking - Day 1



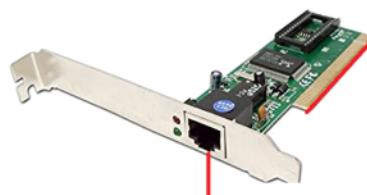
How can two or more computers or "devices" can talk to each other?



LAN - Local Area Network



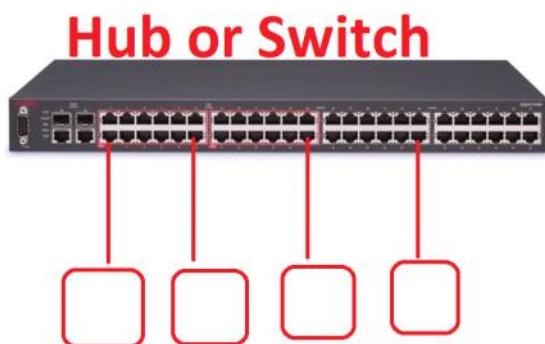
LAN - Local Area Network



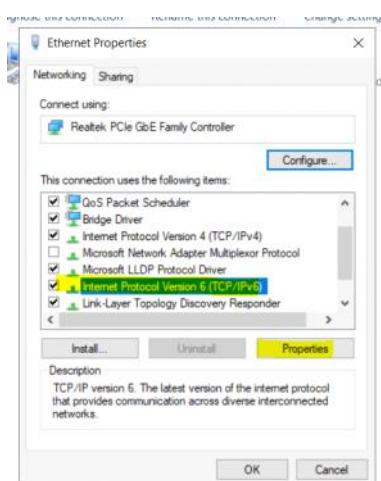
LAN Cables  
Bluetooth  
Wifi  
NFC

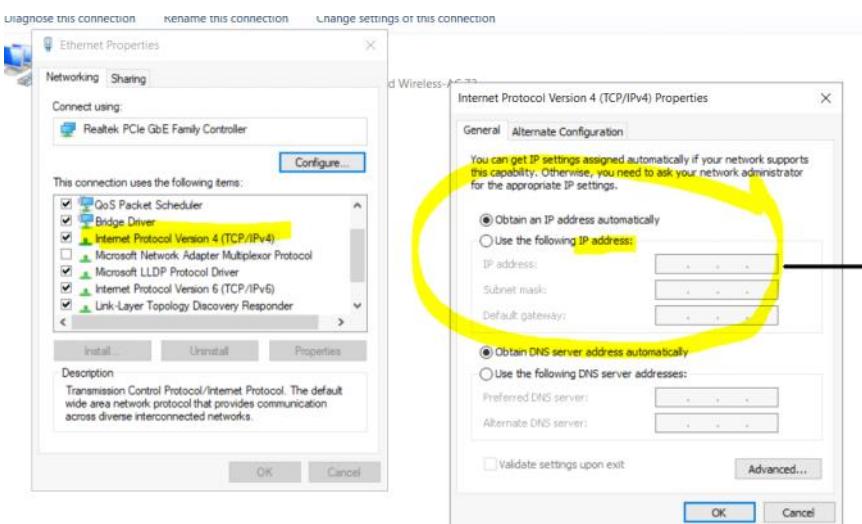
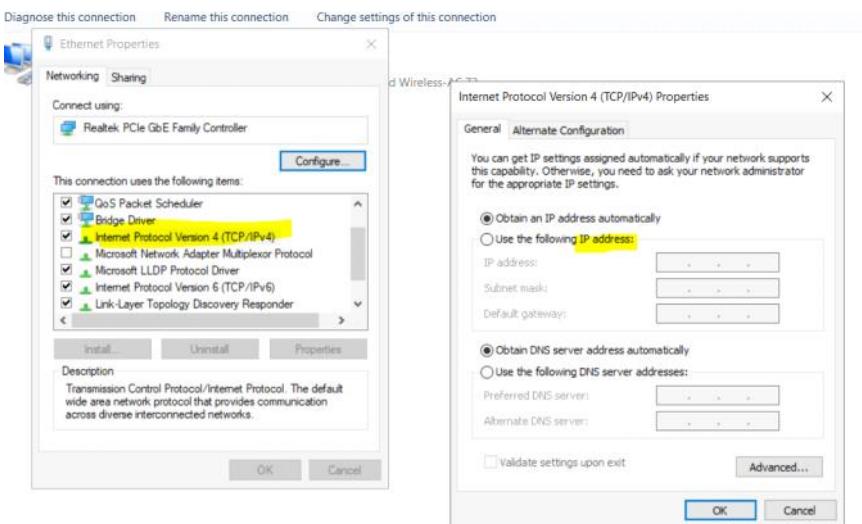
Wired To Wireless

CAPEX | OPEX



capex | opeX





## IP ADDRESS

[https://en.wikipedia.org/wiki/IP\\_address](https://en.wikipedia.org/wiki/IP_address)

An Internet Protocol address (IP address) is a numerical label such as 192.0.2.1 that is connected to a computer network that uses the Internet Protocol for communication.

In IP address serves two main functions: network interface identification and location addressing.

Internet Protocol version 4 (IPv4) defines an IP address as a 32-bit number.<sup>[2]</sup> However, because of the growth of the Internet and the depletion of available IPv4 addresses, a new version of IP (IPv6), using 128 bits for the IP address, was standardized in 1998.

## CIDR

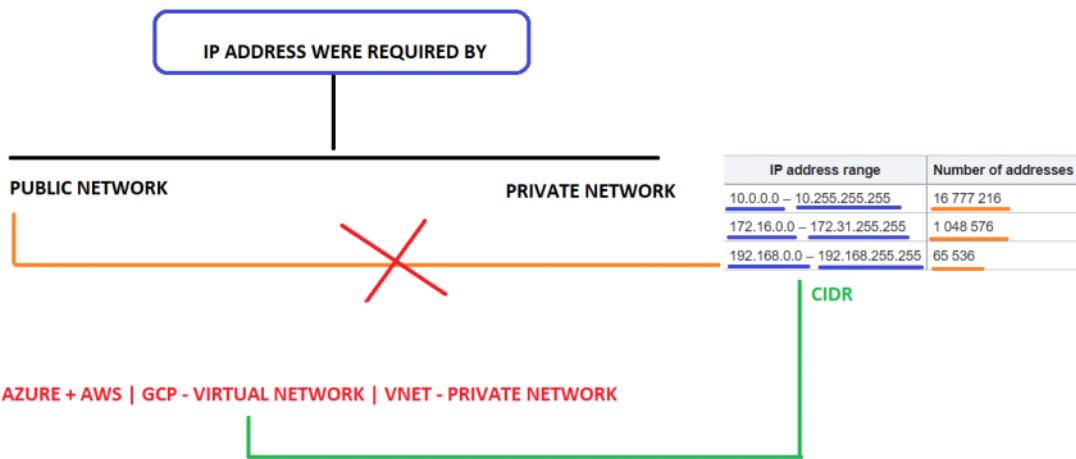
[https://en.wikipedia.org/wiki/Classless\\_Inter-Domain\\_Routing](https://en.wikipedia.org/wiki/Classless_Inter-Domain_Routing)

The Internet Engineering Task Force introduced CIDR in 1993 to replace the previous classful network addressing architecture on the Internet.

IP addresses are described as consisting of two groups of bits in the address: the most significant bits are the network prefix, which identifies a whole network or subnet, and the least significant set forms the host identifier, which specifies a particular interface of a host on that network.

Network can be classified into 2 categories

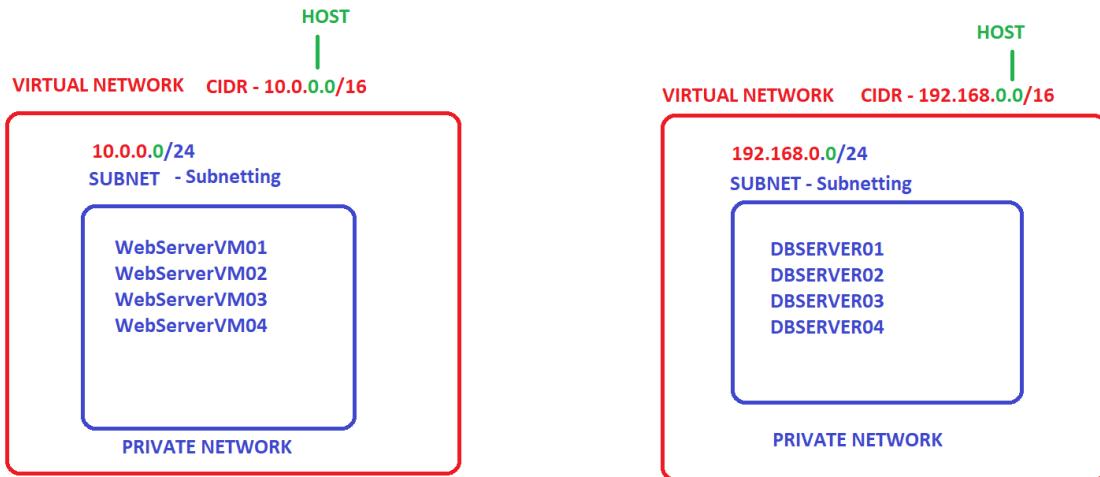
1. Public Network
2. Private Network



IP ADDRESS - 4 Web Server - 4 Database Server

## IP ADDRESS - 4 Web Server - 4 Database Server

IP ADDRESS - 4 Web Server + Database Server										
PRIVATE NETWORK - DB SERVER					IP ADDRESS					
Network	8 Bit		8 Bit		8 Bit		8 Bit		OCTATE	
	192	168	0	0	/16	8BIT	8BIT	8BIT	8BIT	
	0-255	0-255	0-255	0-255	HOST	0-255	0-255	0-255	0-255	
			256	256	65536	CIDR - Classless Inter Domain Routing				
						Number	Number	Number	Number	/BIT
WebServerSubnet										
Network	8 Bit		8 Bit		8 Bit		8 Bit		/24	
	192	168	0	0	/24	HOST	256	251	(5 IPs are reserved by Microsoft)	
	0-255	0-255	0-255	0-255						
VNET - 10.0.0.0/16										
DBServer01	192.168.0.0									
DBServer02	192.168.0.1									
DBServer03	192.168.0.2									
DBServer04	192.168.0.3									
CLASS OF IP ADDRESS										
Class A					0-127					
Class B					128-191					
Class C					192-254					
Class D					255					



## Networking limits - Azure Resource Manager

The following limits apply only for networking resources managed through Azure Resource Manager per region per subscription. Learn how to [view your current resource usage against your subscription limits](#).

### Note

We recently increased all default limits to their maximum limits. If there's no maximum limit column, the resource doesn't have adjustable limits. If you had these limits increased by support in the past and don't see updated limits in the following tables, open an online customer support request at no charge

Resource	Limit
Virtual networks	1,000
Subnets per virtual network	3,000

<https://www.ipaddressguide.com/cidr>

EXAM & Interviews

<https://docs.microsoft.com/en-us/azure/virtual-network/virtual-networks-faq>

## Are there any restrictions on using IP addresses within these subnets?

Yes. Azure reserves the first four and last IP address for a total of 5 IP addresses within each subnet.

For example, the IP address range of 192.168.1.0/24 has the following reserved addresses:

- 192.168.1.0 : Network address
- 192.168.1.1 : Reserved by Azure for the default gateway
- 192.168.1.2, 192.168.1.3 : Reserved by Azure to map the Azure DNS IPs to the VNet space
- 192.168.1.255 : Network broadcast address.

## How small and how large can VNets and subnets be?

The smallest supported IPv4 subnet is /29, and the largest is /2 (using CIDR subnet definitions). IPv6 subnets must be exactly /64 in size.

## CIDR to IP Range

### Result

CIDR Range	10.0.0.0/29
Netmask	255.255.255.248
Wildcard Bits	0.0.0.7
First IP	10.0.0.1
First IP (Decimal)	167772160
Last IP	10.0.0.7
Last IP (Decimal)	167772167
Total Host	8



## CIDR to IP Range

### Result

CIDR Range	10.0.0.0/2
Netmask	192.0.0.0
Wildcard Bits	63.255.255.255
First IP	0.0.0.0
First IP (Decimal)	0
Last IP	63.255.255.255
Last IP (Decimal)	1073741823
Total Host	1,073,741,824

## What is an Azure Virtual Network (VNet)?

An Azure Virtual Network (VNet) is a representation of your own network in the cloud. It is a logical isolation of the Azure cloud dedicated to your subscription. You can use VNs to provision and manage virtual private networks (VPNs) in Azure and, optionally, link the VNs with other VNs in Azure, or with your on-premises IT infrastructure to create hybrid or cross-premises solutions. Each VNet you create has its own CIDR block and can be linked to other VNs and on-premises networks as long as the CIDR blocks do not overlap. You also have control of DNS server settings for VNs, and segmentation of the VNet into subnets.

## Can I peer two VNs with matching or overlapping address ranges?

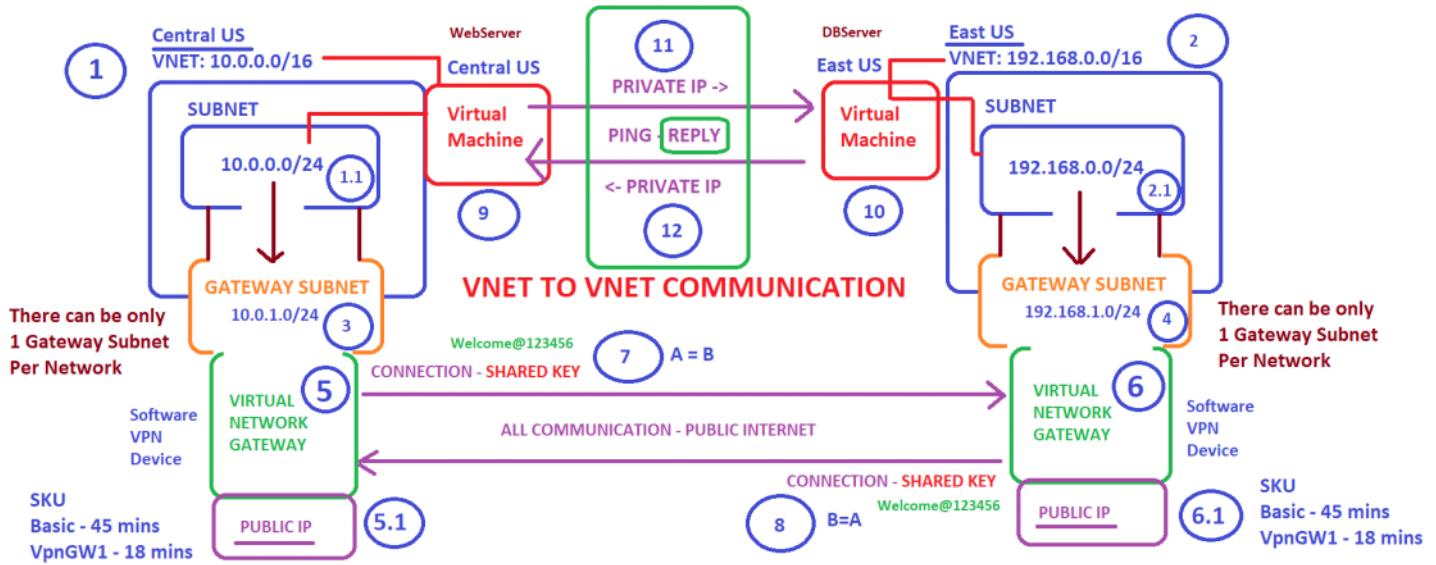
No. Address spaces must not overlap to enable VNet Peering.

### Case Study:

The Customer has been working with Azure for the last few weeks and understood the concepts of VM, VMSS, Storage and WebApp at a top level. The customer is now planning to design an architecture where 2 different set of services are been planned, Web Servers and Database Servers, These are going to be Virtual Machines. The customer wanted to put all the VMs in the same network, but later decided to use different networks for Web Server and different Network for Database Server (From Security point of view). The target audience who would access these server are different and Web Server Administration is also outsourced to 3rd party vendors, so they wanted to protect the server from external attacks, so database VMs are in different network. The customer wants a complete walkthrough or how these networks can be created and also wants to take 1 step ahead and wants these two networks to communicate with each other, so that Web Server can talk to Database Server also.

Important Website: EXAM & Interviews

<https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-about-vpngateways>



## Create a resource group

Basics Tags Review + create

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

Project details

Subscription \*  (highlighted)

Resource group \*  (highlighted)

Resource details

Region \*

## Resource groups

Default Directory (talktorahuljoshioutlook.onmicrosoft.com)

+ Create Manage view Refresh Export to CSV Open query

Filter for any field...	Subscription equals all	Location equals all	+
<input type="checkbox"/> Unsecure resources	<input type="checkbox"/> Recommendations		
<input type="checkbox"/> Name ↑			
<input type="checkbox"/> rg-webserver-centralus			

## Create a resource group

Basics Tags Review + create

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

Project details

Subscription \*

Resource group \*  (highlighted)

Resource details

Region \*

**Resource groups** ...

Default Directory (talktorahuljoshioutlook.onmicrosoft.com)

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

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

Unsecure resources	Recommendations	Subscription	Location
<input type="checkbox"/> rg-dserver-eastus	<input type="checkbox"/> rg-webserver-centralus	MSDN Platforms	East US
<input type="checkbox"/> rg-webserver-centralus		MSDN Platforms	Central US

### Action: Create Virtual Network - Web Server

**Microsoft Azure** Search resources, services, and docs (G+/-)

All services >

**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

Name	Region
No results	

Create a virtual network to securely connect your Azure resources to on-premises networks.

**Virtual networks**

MSDN Platforms

rg-webserver-centralus

Create new

### 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 \* 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 ⌂ Remove subnet

Subnet name

Subnet address range

NAT gateway

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](#) ⓘ

## 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



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

This virtual network doesn't have any subnets.

ⓘ This virtual network doesn't have any subnets.

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

## Add subnet



Subnet name \*

webserversubnet



Subnet address range \* ⓘ

10.0.0.0/24



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

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

 ✓ X

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 X Remove subnet

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

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

[Review + create](#)

< Previous

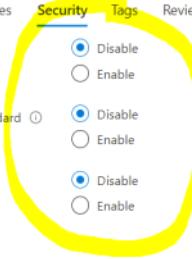
Next : Security >

Download a template for automation

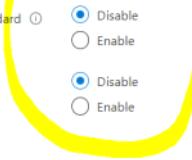
## Create virtual network ...

Basics IP Addresses Security Tags Review + create

BastionHost ⓘ



DDoS Protection Standard ⓘ



Firewall ⓘ



[Review + create](#)

< Previous

Next : Tags >

D

## Create virtual network

Validation passed

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

**Basics**

Subscription	MSDN Platforms
Resource group	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](#) [Next >](#) Download a template for auto

### Microsoft.VirtualNetwork-20220903140507 | Overview

Deployment

Search (Ctrl+ /) < Delete Cancel Redeploy Download Refresh

We'd love your feedback! →

**Your deployment is complete**

Deployment name: Microsoft.VirtualNetwork-20220... Start time: 9/3/2022, 2:12:15 PM  
Subscription: MSDN Platforms Correlation ID: 0ed446a6-5d55-4457-814c

Deployment details Next steps

Go to resource

## Create Virtual Network - DB Server

Microsoft Azure

All services >

**Virtual networks** Default Directory (alktorahuljoshioutlook.onmicrosoft.com)

+ Create Manage view Refresh Export to CSV Opt

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

Name ↑  vnetwebservercentralus

Virtual networks

Azure Active Directory

## 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 *	rg-dbserver-eastus
	<a href="#">Create new</a>

### Instance details

Name *	vnetdbservereastus
Region *	East US



[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

10.1.0.0/16 10.1.0.0 - 10.1.255.255 (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](#) [Remove subnet](#)

Subnet name	Subnet address range	NAT gateway
default	10.1.0.0/24	-

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

## 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
This virtual network doesn't have any subnets.	-	-

[x](#) This virtual network doesn't have any subnets.

[i](#) 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 >

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## Add subnet

X

Subnet name \*

dbsubnet

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 Remove subnet

Subnet name

Subnet address range

NAT gateway

dbsubnet

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 >](#)

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## Create virtual network ...

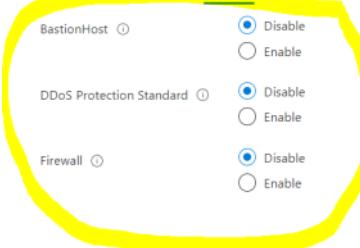
Basics IP Addresses Security Tags Review + create

BastionHost  Disable  Enable

DDoS Protection Standard  Disable  Enable

Firewall  Disable  Enable

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## Create virtual network ...

Validation passed

Basics IP Addresses Security Tags Review + create

**Basics**

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

**IP addresses**

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

**Tags**

None

**Security**

BastionHost	Disabled
DDoS protection plan	Basic

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

## Microsoft.VirtualNetwork-20220903141346 | Overview

Deployment

Search (Ctrl+ /) [Delete](#) [Cancel](#) [Redeploy](#) [Download](#) [Refresh](#)

We'd love your feedback! →

Your deployment is complete

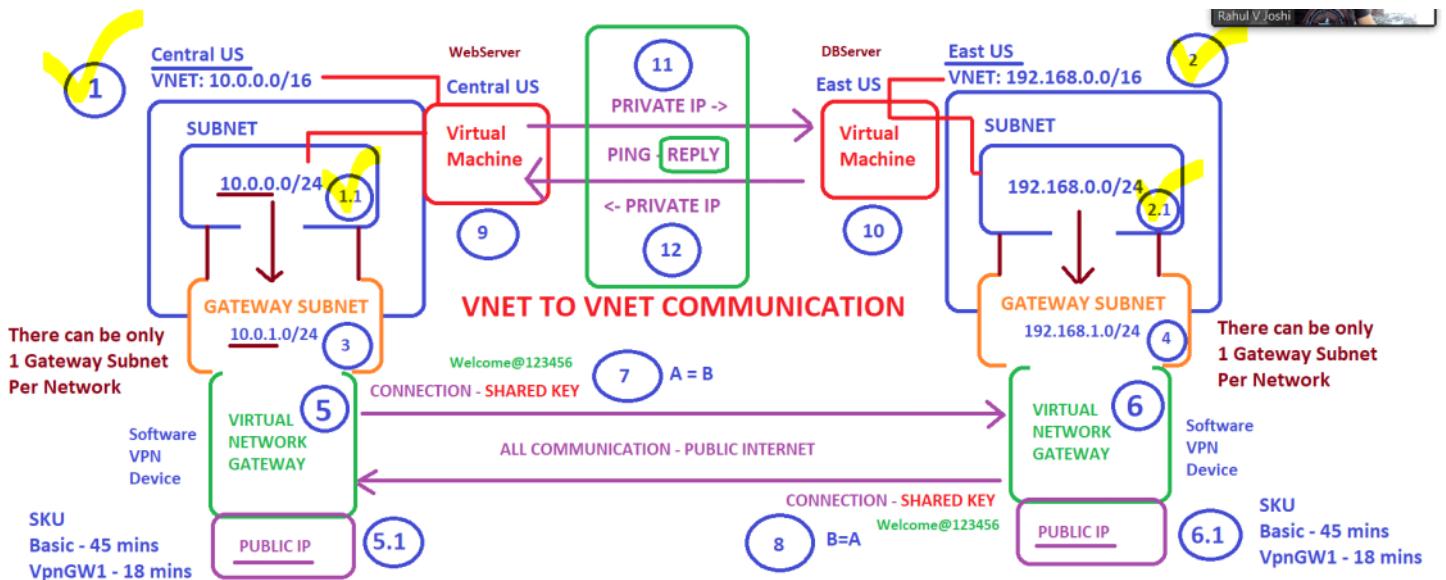
Deployment name: Microsoft.VirtualNetwork-20220903141346  
Subscription: MSDN Platforms  
Resource group: rg-dbserver-eastus

Start time: 9/3/2022, 2:19:29 PM  
Correlation ID: 5bb3ad71-c0d3-4

Deployment details  
Next steps

[Go to resource](#)





#### Create Gateway Subnet for WebServer VNET

All services > 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

Name	Resource group	Location
vnetdbservereastus	rg-dbserver-eastus	East US
vnetwebservercentralus	rg-webserver-centralus	Central US

All services > Virtual networks > vnetwebservercentralus

vnetwebservercentralus | Subnets

Subnet Gateway subnet Refresh Manage users Delete

Subnets

Name	IPv4	IPv6	Available IPs
webserversubnet	10.0.0.0/24	-	251

**Add subnet**

Name	<input type="text" value="GatewaySubnet"/> <span style="float: right;">Copy to clipboard</span>
Subnet address range *	<input type="text" value="10.0.1.0/24"/> <span style="float: right;">10.0.1.0 - 10.0.1.255 (251 + 5 Azure reserved addresses)</span>
<input type="checkbox"/> Add IPv6 address space	
NAT gateway	<input type="text" value="None"/>
Network security group	<input type="text" value="None"/>
Route table	<input type="text" value="None"/>
<b>SERVICE ENDPOINTS</b>	
Create service endpoint policies to allow traffic to specific Azure resources from your virtual network over service endpoints. <a href="#">Learn more</a>	
Services	<input type="text" value="0 selected"/>
<b>SUBNET DELEGATION</b>	
<input type="button" value="Save"/> <input type="button" value="Cancel"/>	

The Name of the Gateway Subnet cannot be changed, it is a read-only textbox. **The name always has to be Gateway Subnet** and automatically the Gateway Subnet takes the next CIDR, as you can see the VNET Subnet uses **10.0.0.0/24** so Gateway Subnet took **10.0.1.0/24**

**vnetwebservercentralalus | Subnets** ★ disabled

**Internal Communication**

**To Talk with VPN**  
**Gateway to talk outside world**

**1 Gateway Subnet per network, Button got disabled**

Name	IPv4	IPv6	Available IPs	Delegated to	Security group
webserversubnet	10.0.0.0/24	-	251	-	-
GatewaySubnet	10.0.1.0/24	-	availability dependent	-	-

#### Create Gateway Subnet for DB Server VNET

**Virtual networks** ...

Default Directory (talktorahuljoshioutlook.onmicrosoft.com)

<input type="checkbox"/> Name ↑	Resource group ↑↓	Location ↑↓
<input type="checkbox"/> vnetdbservereastus	rg-dbserver-eastus	East US
<input type="checkbox"/> vnetwebservercentralalus	rg-webserver-centralalus	Central US

vnetdbservereastus | Subnets

Virtual network

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Settings Address space Connected devices Subnets Bastion

Search subnets

Name ↑↓	IPv4 ↑↓	IPv6 ↑↓	Available IPs ↑↓	Delegated to ↑↓	Security group ↑↓
dbsubnet	192.168.0.0/24	-	251	-	-

## Add subnet

Name

GatewaySubnet

Subnet address range \* ①

192.168.1.0/24

192.168.1.0 - 192.168.1.255 (251 + 5 Azure reserved addresses)

Add IPv6 address space ①

NAT gateway ①

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 ①

0 selected

SUBNET DELEGATION

availability dependent ...

VPN gateway

Save Cancel

All services > Virtual networks > vnetdbservereastus

vnetdbservereastus | Subnets

Virtual network

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

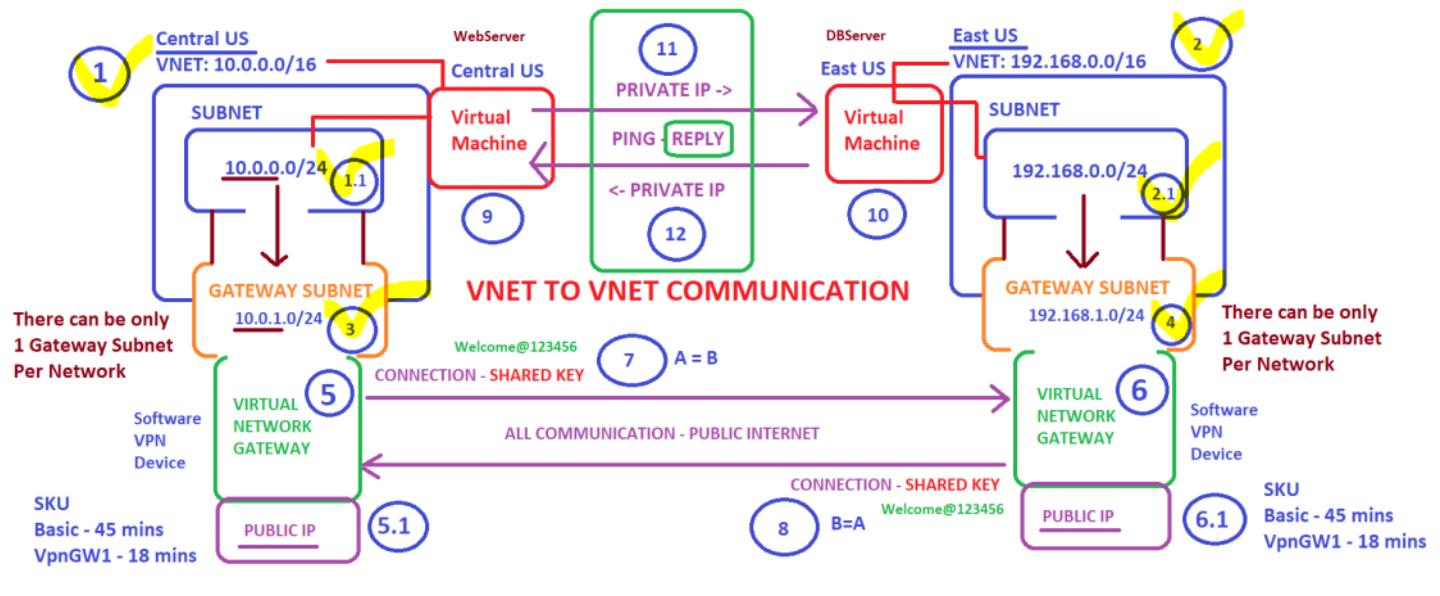
Search subnets

Name ↑↓	IPv4 ↑↓	IPv6 ↑↓	Available IPs ↑↓	Delegated to ↑↓	Security group ↑↓
dbsubnet	192.168.0.0/24	-	251	-	-
GatewaySubnet	192.168.1.0/24	-	availability dependent ...	-	-

Disabled

in transit

VPN gateway



#### EXAM & Interviews

<https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-about-vpngateways>

VPN Gateway **sends encrypted traffic** between an Azure virtual network and an on-premises location **over the public Internet**.

You can also use VPN Gateway to **send encrypted traffic between Azure virtual networks over the Microsoft network**.

A VPN gateway is a specific type of virtual network gateway. **Each virtual network can have only one VPN gateway**.

Each Vnet can have only 1 Gateway Subnet  
Each Vnet can have only 1 VPN Gateway

However, you can create multiple connections to the same VPN gateway

- Site-to-Site VPN connections
- Point-to-Site VPN connections
- VNet-to-VNet VPN connections



#### Planning table

The following table can help you decide the best connectivity option for your solution. Note that ExpressRoute isn't a part of VPN Gateway, but is included in the table.

	Point-to-Site	Site-to-Site	ExpressRoute
<b>Azure Supported Services</b>	Cloud Services and Virtual Machines	Cloud Services and Virtual Machines	Services list
<b>Typical Bandwidths</b>	Based on the gateway SKU	Typically < 10 Gbps aggregate	50 Mbps, 100 Mbps, 200 Mbps, 500 Mbps, 1 Gbps, 2 Gbps, 5 Gbps, 10 Gbps, 100 Gbps
<b>Protocols Supported</b>	Secure Sockets Tunneling Protocol (SSTP), OpenVPN and IPsec	IPsec	Direct connection over VLANs, NSP's VPN technologies (MPLS, VPLS,...)
<b>Routing</b>	RouteBased (dynamic)	We support PolicyBased (static routing) and RouteBased (dynamic routing VPN)	BGP

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
Generation2	VpnGw3AZ	Max. 30	Max. 128	Max. 1000	2.5 Gbps	Supported	Yes
Generation2	VpnGw4AZ	Max. 100*	Max. 128	Max. 5000	5 Gbps	Supported	Yes
Generation2	VpnGw5AZ	Max. 100*	Max. 128	Max. 10000	10 Gbps	Supported	Yes



## Pricing

<https://azure.microsoft.com/en-us/pricing/details/vpn-gateway/>

45 mnins to provision					
Basic	₹2.88/hour	100 Mbps	Max 10 1-10: Included	Max 128 1-128: Included	
VpnGw1	₹15.1781/hour	650 Mbps	Max 30 1-10: Included 11-30: ₹1.199/hour per tunnel	Max 250 1-128: Included 129-250: ₹0.799/hour per connection	
VpnGw2	₹39.1434/hour	1 Gbps	Max 30 1-10: Included 11-30: ₹1.199/hour per tunnel	Max 500 1-128: Included 129-500: ₹0.799/hour per connection	
<b>IN TRAINING, AFTER DEMO, DELETE THE GATEWAY, AS PAUSE BUTTON IS NOT THERE, IT WILL KEEP ON CHARGING PER HOUR, EVEN IF NO USAGE</b>					
VpnGw3	₹99.8556/hour	1.25 Gbps	Max 30 1-10: Included 11-30: ₹1.199/hour per tunnel	Max 1,000 1-128: Included 129-1,000: ₹0.799/hour per connection	
VpnGw4	₹167.7573/hour	5 Gbps	Max 100 1-10: Included 11-100: ₹1.199/hour per tunnel	Max 5,000 1-128: Included 129-5,000: ₹0.799/hour per connection	

Create Virtual Network Gateway (This is Software VPN Device) - Web Server VNET - Central US

Microsoft Azure

All services | Networking

Categories

- All
- Favorites
- Recents
- Categories
- General
- Compute
- Networking**
- Storage
- Web
- Mobile
- Containers
- Databases
- Analytics
- AI + machine learning
- Internet of things

Service endpoint policies  
Web Application Firewall policies (WAF)  
Virtual WANs  
DNS zones  
Application gateways  
IP Groups  
Firewall Policies  
Connections  
**Virtual network gateways**  
Virtual networks (classic)  
Load balancing - help me choose  
Private DNS zones  
Private Link  
Bastions  
Traffic Manager profiles  
NAT gateways  
Firewall Manager  
Firewalls  
Local network gateways  
Network security groups (classic)  
Reserved IP addresses (classic)

All services >

## Virtual network gateways

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

Name ↑	Virtual ... ↓	Gatew... ↑	Resource group ↑	Location ↑
--------	---------------	------------	------------------	------------



### No virtual network gateways to display

Azure VPN Gateway connects your on-premises networks to Azure through Site-to-Site VPNs in a similar way that you set up and connect to a remote branch office. The connectivity is secure and uses the industry-standard protocols Internet Protocol Security (IPsec) and Internet Key Exchange (IKE).

[Create virtual network gateway](#)

[Learn more about Virtual network gateway](#)

## Create virtual network gateway

[Basics](#) Tags Review + create

Azure has provided a planning and design guide to help you configure the various VPN gateway options. [Learn more](#).

### Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription \*

MSDN Platforms

Resource group ⓘ

Select a virtual network to get resource group

### Instance details

Name \*

vpngatewaywebserver

Region \*

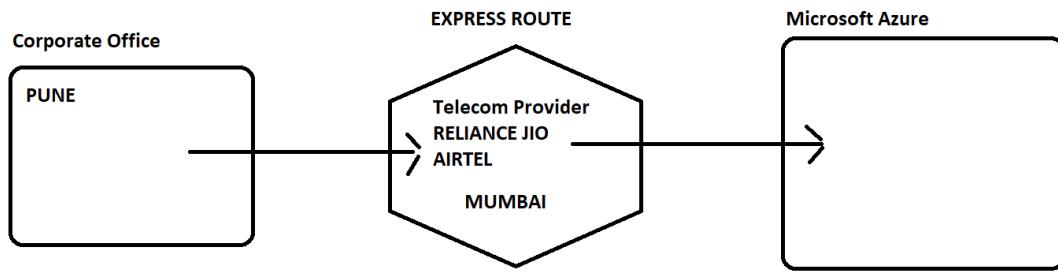
Central US

Gateway type \* ⓘ

VPN  ExpressRoute



VPN - Virtual Private Network - Software VPN device is configured for us. - Basic - 45 minutes and VGw1 - 15-18 minutes to provision  
ExpressRoute - Telecom Provider, between You (Customer) and Microsoft - Telecom provider comes in between



## 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 *	MSDN Platforms
Resource group ⓘ	Select a virtual network to get resource group
<b>Instance details</b>	
Name *	vpngatewaywebserver
Region *	Central US
Gateway type * ⓘ	<input checked="" type="radio"/> VPN <input type="radio"/> ExpressRoute
VPN type * ⓘ	<input checked="" type="radio"/> Route-based <input type="radio"/> Policy-based

SKU * ⓘ	VpnGw1
Generation ⓘ	Generation1
Virtual network * ⓘ	vnetwebservercentralus
Subnet ⓘ	GatewaySubnet (10.0.1.0/24)
<div></div>	
<small>Only virtual networks in the currently selected subscription and region are listed.</small>	



As we can see above the minute we select VNET, automatically Gateway details were shown, which means, Gateway subnet is important for configuring VNG (Gateway)

Public IP Address Type * ⓘ	<input type="radio"/> Basic <input checked="" type="radio"/> Standard
<b>Public IP address</b>	
Public IP address * ⓘ	<input checked="" type="radio"/> Create new <input type="radio"/> Use existing
Public IP address name *	publicipwebservergateway
Public IP address SKU	Standard
Assignment	<input type="radio"/> Dynamic <input checked="" type="radio"/> Static
Enable active-active mode * ⓘ	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Configure BGP * ⓘ	<input type="radio"/> Enabled <input checked="" type="radio"/> 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.

## Create virtual network gateway ...

Validation passed

Basics Tags Review + create

**Basics**

Subscription	MSDN Platforms
Resource group	rg-webserver-centralus
Name	vpngatewaywebserver
Region	Central US
SKU	VpnGw1
Generation	Generation1
Virtual network	vnetwebservercentralus
Subnet	GatewaySubnet (10.0.1.0/24)
Gateway type	Vpn
VPN type	RouteBased
Enable active-active mode	Disabled
Configure BGP	Disabled
Public IP address	publicipwebservergateway

**Tags**

None

**Create** Previous Next Download a template for automation

Microsoft.VirtualNetworkGateway-20220903144248 | Overview

Deployment

Search (Ctrl+ /) Delete Cancel Redeploy Download Refresh

We'd love your feedback! →

☰ Deployment is in progress

Deployment name: Microsoft.VirtualNetworkGateway-20220903144248 Start time: 9/3/2022, 2:54:02 PM  
Subscription: MSDN Platforms Correlation ID: 8471b036-9a3c-441d-8d36-81  
Resource group: rg-webserver-centralus

▴ Deployment details

Resource	Type	Status	Operation details
No results.			

## Create Virtual Network Gateway for DB Server VNET - Region East US

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

+ Create a resource

- Home
- Dashboard
- All services
- FAVORITES
- All resources
- Resource groups
- App Services
- Function App
- SQL databases
- Azure Cosmos DB
- Virtual machines
- Load balancers
- Storage accounts
- Virtual networks
- Azure Active Directory
- Monitor

All services | Networking

All Favorites Recents Categories

- General
- Compute
- Networking
- Storage
- Web
- Mobile
- Containers
- Databases
- Analytics
- AI + machine learning
- Internet of things

- Service endpoint policies
- Web Application Firewall policies (WAF)
- Virtual WANs
- DNS zones
- Application gateways
- IP Groups
- Firewall Policies
- Connections
- Virtual network gateways
- Virtual networks (classic)
- Load balancing - help me choose
- Private DNS zones
- Private Link
- Bastions
- Traffic Manager profiles
- NAT gateways
- Firewall Manager
- Firewalls
- Local network gateways
- Network security groups (classic)
- Reserved IP addresses (classic)

## Virtual network gateways ...

Default Directory (talktorahuljoshioutlook.onmicrosoft.com)

 Create  Manage view  Refresh  Export to CSV 

Filter for any field... 

Subscription equals all 

Resource group 

Name ↑ V

### 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 \*  MSDN Platforms

Resource group  rg-dbserver-eastus (derived from virtual network's resource group)

#### Instance details

Name \*  vpngatewaydbserver 

Region \*  East US

Gateway type \*   VPN  ExpressRoute

VPN type \*   Route-based  Policy-based

SKU \*  VpnGw1

Generation  Generation1

Virtual network \*  vmetdbservereastus 

Subnet  GatewaySubnet (192.168.1.0/24)

#### Public IP address

Public IP address \*   Create new  Use existing

Public IP address name \*  publicipdbservergateway 

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 : Tags >](#)

[Download a template for automation](#)

## Create virtual network gateway ...

Validation passed

Basics Tags Review + create

### Basics

Subscription	MSDN Platforms
Resource group	rg-dbserver-eastus
Name	vpngatewaydbserver
Region	East US
SKU	VpnGw1
Generation	Generation1
Virtual network	vnetdbservereastus
Subnet	GatewaySubnet (192.168.1.0/24)
Gateway type	Vpn
VPN type	RouteBased
Enable active-active mode	Disabled
Configure BGP	Disabled
Public IP address	publicipdbservergateway

### Tags

None

**Create**

Previous

Next

Download a template for automation

## Microsoft.VirtualNetworkGateway-20220903145458 | Overview

Deployment

Search (Ctrl+ /)

Delete

Cancel

Redeploy

Download

Refresh

### Deployment is in progress

Deployment name: Microsoft.VirtualNetworkGateway-2... Start time: 9/3/2022, 2:57:04  
Subscription: MSDN Platforms Correlation ID: dbb66072-19  
Resource group: rg-dbserver-eastus

#### Deployment details

Resource	Type	Status	Op
No results.			

### Notifications

More events in the activity log →

Dismiss all ▾

#### Deployment in progress...

Running X

Deployment to resource group 'rg-dbserver-eastus' is in progress.

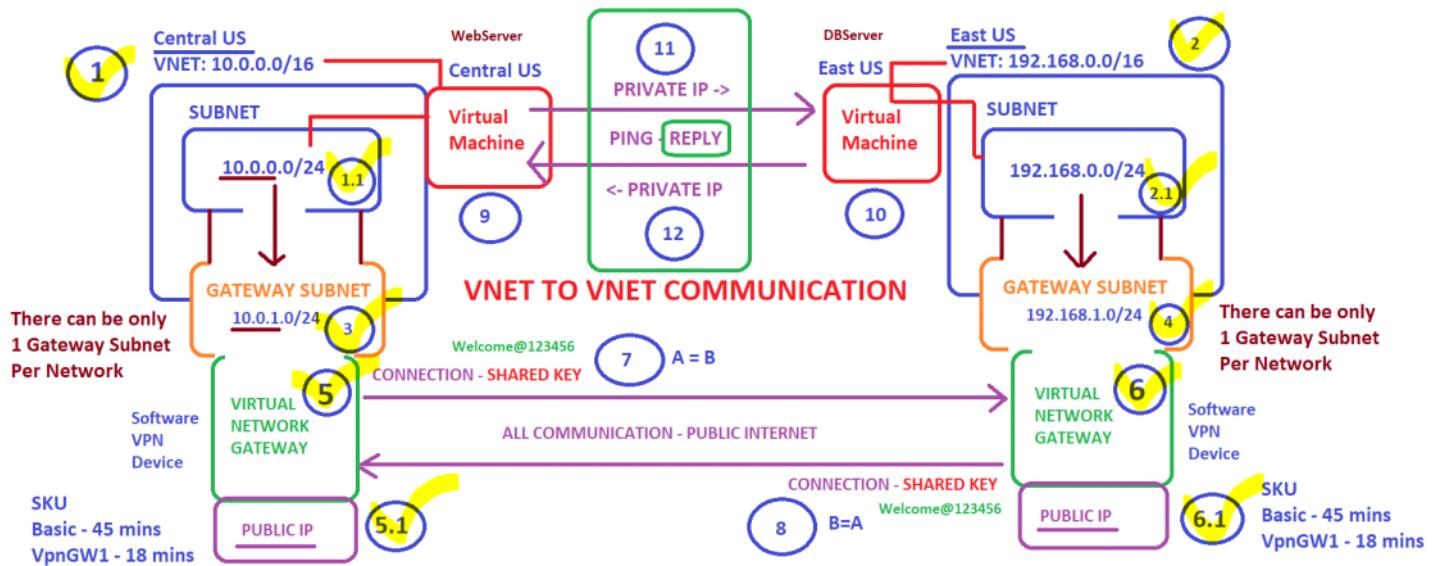
a few seconds ago

#### Deployment in progress...

Running X

Deployment to resource group 'rg-webserver-centralus' is in progress.

3 minutes ago



Rather than Waiting for the Gateway to create, we will now create VMs (WebServer VM and DB Server VM)

1. Choose Right Region (Central US & East US)
2. Windows Server 2016 Datacenter edition
3. B2MS Size
4. RDP Allowed
5. OS Disk - Standard Disk
6. Networking - Choose the right network (If Web Server - 10.0.0.0/16) and if DB Server (192.168.0.0/16)
7. Boot Diagnostics - OFF
8. Review Create - Create

#### 1st VM - Central US - Web Server

Virtual machines ...

Default Directory (talktorahuljoshioutlook.onmicrosoft.com)

+ Create Switch to classic Reservations Manage via

Filter for any field... Subscription equals all Type equals all

Name ↑	Type ↑↓	Subscripti
--------	---------	------------

#### Create a virtual machine ...

for full customization. [Learn more](#)

##### Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *	<input type="text" value="MSDN Platforms"/>
Resource group *	<input type="text" value="rg-webserver-centralus"/> <span style="color: green;">Create new</span>
Instance details	
Virtual machine name *	<input type="text" value="WebServer01"/>
Region *	<input type="text" value="(US) Central US"/>
Availability options	<input type="text" value="No infrastructure redundancy required"/>
Security type	<input type="text" value="Standard"/>
Image *	<input type="text" value="Windows Server 2016 Datacenter - Gen2"/> <span style="color: green;">See all images   Configure VM generation</span>

## Create a virtual machine ...

Size \* ⓘ Standard\_B2ms v2 vcpus, 8 GiB memory (₹5,248.79/month) ▾  
See all sizes

Administrator account

Username \* ⓘ rahul ✓  
Password \* ⓘ ..... ✓  
Confirm password \* ⓘ ..... ✓

Inbound port rules

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

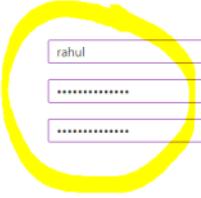
Public inbound ports \* ⓘ  None  Allow selected ports  
Select inbound ports \* RDP (3389)

Licensing

Save up to 49% with a license you already own using Azure Hybrid Benefit. [Learn more ⓘ](#)

Would you like to use an existing Windows Server license? \* ⓘ

[Review Azure hybrid benefit compliance ⓘ](#)


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

## Create a virtual machine ...

Basics Disks Networking Management Advanced Tags Review + create

Azure VMs have one operating system disk and a temporary disk for short-term storage. You can attach additional data disks. The size of the VM determines the type of storage you can use and the number of data disks allowed. [Learn more ⓘ](#)

Disk options

OS disk type \* ⓘ Standard HDD (locally-redundant storage) ▾  
The selected VM size supports premium disks. We recommend Premium SSD for high IOPS workloads. Virtual machines with Premium SSD disks qualify for the 99.9% connectivity SLA.

Delete with VM ⓘ

Enable encryption at host ⓘ


Encryption type \* (Default) Encryption at-rest with a platform-managed key

Enable Ultra Disk compatibility ⓘ   
Ultra disk is supported in Availability Zone(s) 1,2,3 for the selected VM size Standard\_B2ms.

Data disks for WebServer01

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

## 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 \*  [Create new](#)

Subnet \*  [Manage subnet configuration](#)

Public IP  [Create new](#)

NIC network security group  None  Basic  Advanced

Public inbound ports \*  None  Allow selected ports

Select inbound ports \*

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

## Create a virtual machine ...

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

Configure monitoring and management options for your VM.

### Microsoft Defender for Cloud

Microsoft Defender for Cloud provides unified security management and advanced threat protection across hybrid cloud workloads. [Learn more](#)

Your subscription is protected by Microsoft Defender for Cloud basic plan.

### Monitoring

Boot diagnostics  Enable with managed storage account (recommended)  Enable with custom storage account  Disable

Enable OS guest diagnostics

### Identity

Enable system assigned managed identity

### Azure AD

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

## 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   
**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 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, go

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

home > CreateVm-MicrosoftWindowsServer.WindowsServer-201-20220903150155 | Overview

Deployment

Search (Ctrl+ /) Delete Cancel Redeploy Download Refresh

Overview Inputs Outputs Template

We'd love your feedback! →

Deployment is in progress

Deployment name: CreateVm-MicrosoftWindowsServer.Windo... Start time: 9/3/2022, 3:05:18 PM

Subscription: MSDN Platforms Correlation ID: 6f4109fb-abd9-4d91-b373-c

Resource group: rg-webserver-centralus

Deployment details

Resource	Type	Status	Operation details
✓ webserver01495	Microsoft.Network/netw...	Created	Operation details
✓ WebServer01-ip	Microsoft.Network/public...	OK	Operation details
✓ WebServer01-nsg	Microsoft.Network/netw...	OK	Operation details

## 2nd VM - DB Server - East US

Virtual machines ⚡ ...

Default Directory (talktorahuljoshioutlook.onmicrosoft.com)

+ Create Switch to classic Reservations

Filter for any field... Subscription equals all Type

## Create a virtual machine ...

Subscription \* MSDN Platforms

Resource group \* rg-dbserver-eastus

Instance details

Virtual machine name \* DBServer01

Region \* (US) East US

Availability options No infrastructure redundancy required

Security type Standard

Image \* Windows Server 2016 Datacenter - Gen2

VM architecture  x64  Arm64

Arm64 is not supported with the selected image.

Administrator account

Username \* rahul

Password \*

Inbound port rules

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

Public inbound ports \* None

Select inbound ports \* RDP (3389)

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 create rules to limit inbound traffic to known IP addresses.

## Licensing

Save up to 49% with a license you already own using Azure Hybrid Benefit. [Learn more](#)

Would you like to use an existing Windows Server license? \*



[Review Azure hybrid benefit compliance](#)

## Create a virtual machine ...

Basics Disks Networking Management Advanced Tags Review + create

Azure VMs have one operating system disk and a temporary disk for short-term storage. You can attach additional data disks. The size of the VM determines the type of storage you can use and the number of data disks allowed. [Learn more](#)

### Disk options

OS disk type \* ⓘ

Standard HDD (locally-redundant storage)

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

Delete with VM ⓘ



Enable encryption at host ⓘ



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

Encryption type \*

(Default) Encryption at-rest with a platform-managed key

Enable Ultra Disk compatibility ⓘ



Ultra disk is supported in Availability Zone(s) 1,2,3 for the selected VM size Standard\_B2ms.

### Data disks for DBServer01

[Review + create](#)

< Previous

Next : Networking >

## 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 \* ⓘ

vnetdbservereastus

[Create new](#)

Subnet \* ⓘ

dbsubnet (192.168.0.0/24)

[Manage subnet configuration](#)

Public IP ⓘ

(new) DBServer01-ip

[Create new](#)

NIC network security group ⓘ

None

Basic

Advanced

Public inbound ports \* ⓘ

None

Allow selected ports

Select inbound ports \*

RDP (2222)

[Review + create](#)

< Previous

Next : Management >

## Create a virtual machine ...

Basics Disks Networking Management Advanced Tags Review + create

Configure monitoring and management options for your VM.

### Microsoft Defender for Cloud

Microsoft Defender for Cloud provides unified security management and advanced threat protection across hybrid cloud workloads. [Learn more](#)

✓ Your subscription is protected by Microsoft Defender for Cloud basic plan.

### Monitoring

Boot diagnostics ⓘ

Enable with managed storage account (recommended)

Enable with custom storage account

Disable

## Create a virtual machine

Validation passed

**⚠ You have set RDP port(s) open to the internet.** This is only recommended for testing. If you want to go back to Basics tab.

**Basics**

Subscription	MSDN Platforms
Resource group	rg-dserver-eastus
Virtual machine name	DBServer01
Region	East US
Availability options	No infrastructure redundancy required
Security type	Standard
Image	Windows Server 2016 Datacenter - Gen2
VM architecture	x64
Size	Standard B2ms (2 vcpus, 8 GiB memory)
Username	rahul
Public inbound ports	RDP
Already have a Windows license?	No
Azure Spot	No

**Disk**

**Create** < Previous Next > Download a template for automation

**CreateVm-MicrosoftWindowsServer.WindowsServer-201-20220903151308 | Overview**

Deployment

Search (Ctrl+ /) Delete Cancel Redeploy Download Refresh

We'd love your feedback! →

\*\*\* Deployment is in progress

Deployment name: CreateVm-MicrosoftWindowsServer.WindowsServer-201-20220903151308 Subscription: MSDN Platforms Resource group: rg-dserver-eastus Start time: 9/3/2022, 3:14:45 PM Correlation ID: 24f0efab-f720-42c

Deployment details

Resource	Type	Status	Operation detail
No results.			

## Notifications

More events in the activity log → Dismiss all ▾

\*\*\* Deployment in progress... Running X Deployment to resource group 'rg-dserver-eastus' is in progress. a few seconds ago

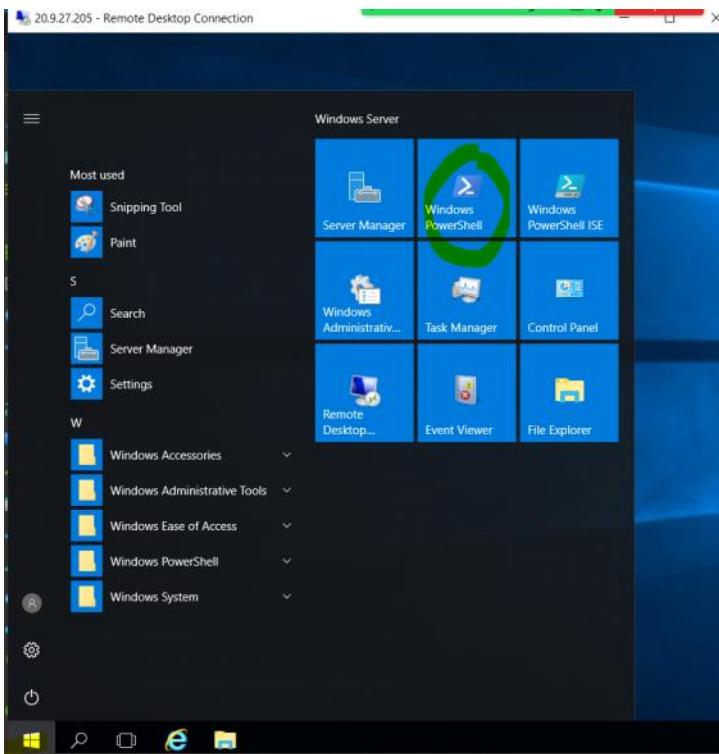
\*\*\* Deployment in progress... Running X Deployment to resource group 'rg-dserver-eastus' is in progress. 18 minutes ago

\*\*\* Deployment in progress... Running X Deployment to resource group 'rg-webserver-centralus' is in progress. 21 minutes ago

**VPN**

As Gateways are still getting created, let us login to both the VM and run the powershell script to enable PING on the VMs, by default PING is disable on the VM.

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



```
Administrator: Windows PowerShell
Copyright (C) 2016 Microsoft Corporation. All rights reserved.

PS C:\Users\rahul> New-NetFirewallRule -DisplayName "Allow ICMPv4-In" -Protocol ICMPv4

Name : {2950a0fd-36f8-409e-ab2d-82ac27ad4907}
DisplayName : Allow ICMPv4-In
Description :
DisplayGroup :
Group :
Enabled : True
Profile : Any
Platform : {}
Direction : Inbound
Action : Allow
Block : False
LooseSourceMapping : False
LocalOnlyMapping : False
Owner :
PrimaryStatus : OK
Status : The rule was parsed successfully from the store. (65536)
EnforcementStatus : NotApplicable
PolicyStoreSource : PersistentStore
PolicyStoreSourceType : Local

PS C:\Users\rahul>
```

```
Administrator: Windows PowerShell
Copyright (C) 2016 Microsoft Corporation. All rights reserved.

PS C:\Users\rahul> New-NetFirewallRule -DisplayName "Allow ICMPv4-In" -Protocol ICMPv4

Name : {13479ac1-clef-40f6-a93d-82dcbe552adc}
DisplayName : Allow ICMPv4-In
Description :
DisplayGroup :
Group :
Enabled : True
Profile : Any
Platform : {}
Direction : Inbound
Action : Allow
Block : False
LooseSourceMapping : False
LocalOnlyMapping : False
Owner :
PrimaryStatus : OK
Status : The rule was parsed successfully from the store. (65536)
EnforcementStatus : NotApplicable
PolicyStoreSource : PersistentStore
PolicyStoreSourceType : Local

PS C:\Users\rahul>
```

```
Administrator: Windows PowerShell
Copyright (C) 2016 Microsoft Corporation. All rights reserved.

PS C:\Users\rahul> ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:
  Connection-specific DNS Suffix . : f2d11b5yih0uzcbvskov0fobgd.gx.internal.cloudapp.net
  Link-local IPv6 Address . . . . . : fe80::87c:285e:cf6f:cfa%2
  IPv4 Address . . . . . : 10.0.0.4
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : 10.0.0.1

Tunnel adapter isatap.f2d11b5yih0uzcbvskov0fobgd.gx.internal.cloudapp.net:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . . . . . : f2d11b5yih0uzcbvskov0fobgd.gx.internal.cloudapp.net

Tunnel adapter Teredo Tunneling Pseudo-Interface:
  Connection-specific DNS Suffix . . . . . : 2001:0:34f1:8072:1819:2d0a:fsff:ffff
  Link-local IPv6 Address . . . . . : fe80::1819:2d0a:fsff:ffff%8
  Default Gateway . . . . . : ::

PS C:\Users\rahul>
PS C:\Users\rahul>
```

```
Rahul V Joshi Administrator: Windows PowerShell
Copyright (C) 2016 Microsoft Corporation. All rights reserved.

PS C:\Users\rahul> ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:
  Connection-specific DNS Suffix . . . . . : m5owcswafjoe1lm1lmlm1fu4zb.bx.internal.cloudapp.net
  Link-local IPv6 Address . . . . . : fe80::ec3f:83a6:704:9752%2
  IPv4 Address . . . . . : 192.168.0.4
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : 192.168.0.1

Tunnel adapter isatap.m5owcswafjoe1lm1lmlm1fu4zb.bx.internal.cloudapp.net:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . . . . . : m5owcswafjoe1lm1lmlm1fu4zb.bx.internal.cloudapp.net

Tunnel adapter Teredo Tunneling Pseudo-Interface:
  Connection-specific DNS Suffix . . . . . : 2001:0:34f1:8072:3821:194:3f57:ffff
  Link-local IPv6 Address . . . . . : fe80::3821:194:3f57:ffff%8
  Default Gateway . . . . . : ::

PS C:\Users\rahul>
```

The screenshot shows the Azure Notifications page with two deployment succeeded events listed:

- Deployment 'Microsoft.VirtualNetworkGateway-20220903145458' to resource group 'rg-dserver-eastus' was successful. (3 minutes ago)
- Deployment 'Microsoft.VirtualNetworkGateway-20220903144248' to resource group 'rg-webserver-centralus' was successful. (4 minutes ago)

Buttons for 'Go to resource' and 'Pin to dashboard' are visible for each event.

Took around 20 To 22 minutes for provisioning

Time has come to do 2 Way Connection

First we will go to Web Server Gateway

The screenshot shows the 'rg-webserver-centralus' Resource Group Overview page. The 'Essentials' section includes:

- Subscription (move): MSDN Platforms
- Subscription ID: ee7bab70-0709-4f4f-9829-790225dc5be4
- Tags (edit): Click here to add tags
- Deployments: 3 Succeeded
- Location: Central US

The 'Resources' section lists the following resources:

Name	Type	Location
publicipwebservergateway	Public IP address	Central I
vnetwebservercentralus	Virtual network	Central I
<b>vpngatewaywebserver</b>	Virtual network gateway	Central I
WebServer01	Virtual machine	Central I
WebServer01-ip	Public IP address	Central I

The screenshot shows the 'vpngatewaywebserver' Virtual Network Gateway Overview page. The 'Essentials' section includes:

- Resource group (move): rg-webserver-centralus
- Location: Central US
- Subscription (move): MSDN Platforms
- Subscription ID: ee7bab70-0709-4f4f-9829-790225dc5be4
- SKU: VpnGw
- Gateway type: VPN
- VPN type: Route-I
- Virtual network: vnetwe
- Public IP address: 40.122.

The 'Connections' section is highlighted in yellow. The 'Health check' section shows a green status with the message: 'Perform a quick health check to detect possible gateway issues'. Buttons for 'Go to Resource health' and 'View documentation' are present.

## vpngatewaywebserver | Connections

Virtual network gateway

<input type="button" value="Search (Ctrl+J)"/>	<input type="button" value="Add"/>	<input type="button" value="Refresh"/>
<a href="#">Overview</a>		
<a href="#">Activity log</a>		
<a href="#">Access control (IAM)</a>		
<a href="#">Tags</a>		
<a href="#">Diagnose and solve problems</a>		
<b>Settings</b>		
<a href="#">Configuration</a>		

### Add connection

vpngatewaywebserver

Name \*  ✓

Connection type  A

\*First virtual network gateway  B

\*Second virtual network gateway  C ✓

Shared key (PSK) \*

Use Azure Private IP Address

Enable BGP

IKE Protocol

Subscription

Resource group

**OK**

### Choose virtual network gateway

To use a virtual network with a connection, it must be associated to a virtual network gateway. [Learn more](#)

<input type="radio"/> vpngatewaywebserver	rg-webserver-eastus
<input type="radio"/> vpngatewaywebserver	rg-webserver-centralus

\*First virtual network gateway  A

A mixture of letters and numbers, used to establish encryption for the connection. The same shared key must be used in both the virtual network and local network gateways. If your gateway device doesn't provide one, you can make one up here and provide it to your device.

Shared key (PSK) \*  ✓

Use Azure Private IP Address

Enable BGP

IKE Protocol

Subscription

Resource group

**OK**

**Add connection** ...

Name \*  ✓

Connection type  VNet-to-VNet

\*First virtual network gateway  vpngatewaywebserver

\*Second virtual network gateway  vpngatewaydbserver

Shared key (PSK) \*  ✓

Use Azure Private IP Address

Enable BGP

IKE Protocol  IKEv1  IKEv2

Subscription  MSDN Platforms

Resource group

### Now, 2nd Connection this will be from DB Server Gateway

<input type="checkbox"/> Name ↑↓	Type ↑↓	Location ↑↓
<input type="checkbox"/> dbserver01317	Network Interface	East US
<input type="checkbox"/> DBServer01_OsDisk_1_0af465745ad847538283c3f499fef838	Disk	East US
<input type="checkbox"/> publicipdbservergateway	Public IP address	East US
<input type="checkbox"/> vnetdbservereastus	Virtual network	East US
<input type="checkbox"/> vpngatewaydbserver	Virtual network gateway	East US

vpngatewaydbserver

Virtual network gateway

Search (Ctrl+I)  Refresh

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

Settings  Configuration  Connections  Point-to-site configuration  Properties  Locks

**Essentials**

Resource group ([move](#)) : rg-dbserver-eastus  
Location : East US  
Subscription ([move](#)) : MSDN Platforms  
Subscription ID : ee7bab70-0709-4f4f-9829-790225dc5be4

Tags ([edit](#)) : [Click here to add tags](#)

**Health check**  
Perform a quick health check to detect possible gateway issues  
[Go to Resource health](#)

vpngatewaydbserver | 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

Locks

Monitoring

No results

All services > Resource groups > rg-dbserver-eastus > vpngatewaydbserver | Connections >

### Add connection

vpngatewaydbserver

Name \*: EastUSFriendsCentralUS

Connection type: VNet-to-VNet

\*First virtual network gateway: vpngatewaydbserver

\*Second virtual network gateway: Choose another virtual network gateway

Shared key (PSK) \*

### Choose virtual network gateway

To use a virtual network with a connection, it must be associated to a virtual network gateway.

vpngatewaywebserver rg-webserver-centralus

vpngatewaydbserver rg-dbserver-eastus

### Add connection

vpngatewaydbserver

Name \*: EastUSFriendsCentralUS

Connection type: VNet-to-VNet

\*First virtual network gateway: vpngatewaydbserver

\*Second virtual network gateway: vpngatewaywebserver

Shared key (PSK) \*: Welcome@123456

Use Azure Private IP Address

Enable BGP

IKE Protocol: IKEv2

Subscription: MSDN Platforms

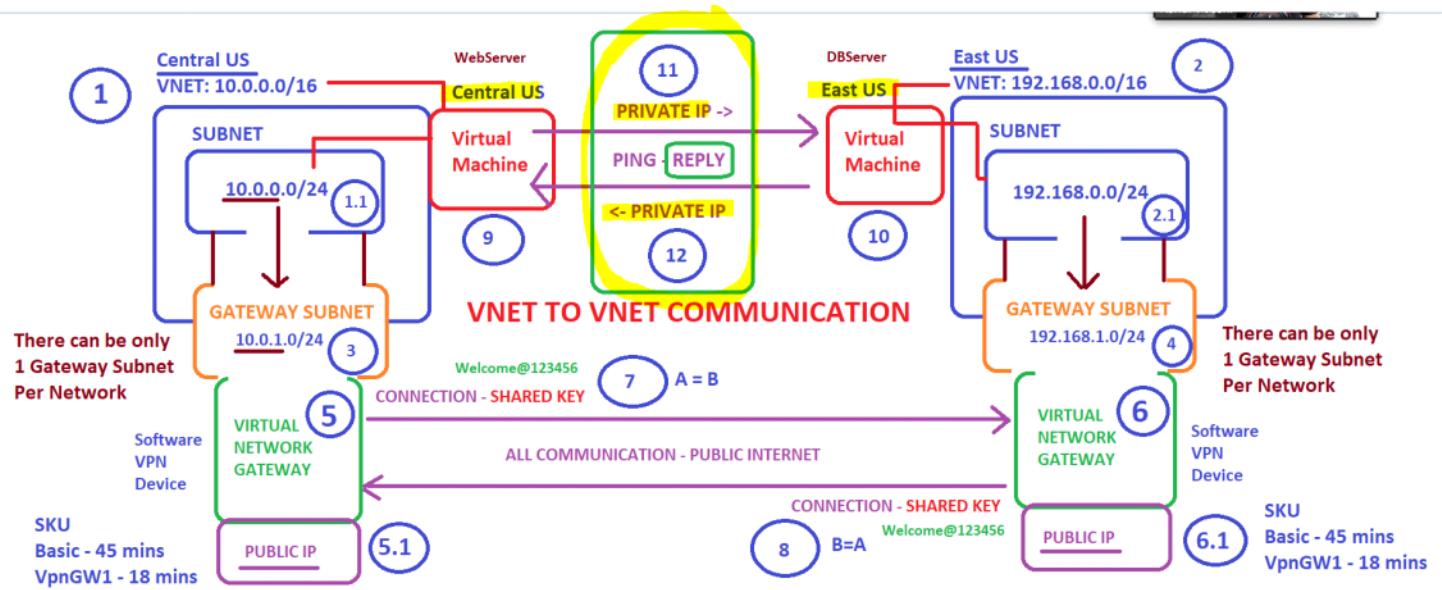
Resource group:

OK

**Now, the Final Part,**

**Ping from EAST US, the Private IP of the VM in Central US**

## Ping from Central US, the Private IP of the VM in East Us



```
[Administrator: Windows PowerShell]
PrimaryStatus : OK
StatusMessage : The rule was parsed successfully from the store. (65536)
EnforcementStatus : NotApplicable
PolicyStoreSource : PersistentStore
PolicyStoreSourceType : Local

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

Ethernet adapter Ethernet:

  Connection-specific DNS Suffix . : f2d1b5yih0uzcbvskov0fobgd.gx.internal.cloudapp.net
  Link-local IPv6 Address . . . . . : fe80::87c:285e:cf6f:cfa%2
    IPv4 Address . . . . . : 10.0.0.4
      Subnet Mask . . . . . : 255.255.255.0
        Default Gateway . . . . . : 10.0.0.1

Tunnel adapter isatap.f2d1b5yih0uzcbvskov0fobgd.gx.internal.cloudapp.net:

  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . : f2d1b5yih0uzcbvskov0fobgd.gx.internal.cloudapp.net

Tunnel adapter Teredo Tunneling Pseudo-Interface:

  Connection-specific DNS Suffix . :
  IPv6 Address . . . . . : 2001:0:34f1:8072:1819:2d0a:f5ff:ffff
  Link-local IPv6 Address . . . . . : fe80::1819:2d0a:f5ff:ffff%8
  Default Gateway . . . . . : ::

PS C:\Users\rahul>
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=25ms TTL=128
Reply from 192.168.0.4: bytes=32 time=27ms TTL=128
Reply from 192.168.0.4: bytes=32 time=27ms TTL=128
Reply from 192.168.0.4: bytes=32 time=26ms TTL=128
Reply from 192.168.0.4: bytes=32 time=88ms TTL=128
Reply from 192.168.0.4: bytes=32 time=27ms TTL=128
Reply from 192.168.0.4: bytes=32 time=54ms TTL=128
Reply from 192.168.0.4: bytes=32 time=30ms TTL=128
Reply from 192.168.0.4: bytes=32 time=27ms TTL=128
Reply from 192.168.0.4: bytes=32 time=27ms TTL=128
Reply from 192.168.0.4: bytes=32 time=29ms TTL=128
Reply from 192.168.0.4: bytes=32 time=79ms TTL=128
```

Administrator: Windows PowerShell

Rahul V Joshi

```
PS C:\Users\rahul> ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

  Connection-specific DNS Suffix . : m50cswafjoelmn1rlm1fu4zb.bx.internal.cloudapp.net
  Link-local IPv6 Address . . . . . : fe80::ec3f:8a6:704:9752%2
  IPv4 Address . . . . . : 192.168.0.1
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : 192.168.0.1

Tunnel adapter isatap.m50cswafjoelmn1rlm1fu4zb.bx.internal.cloudapp.net:

  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix' . : m50cswafjoelmn1rlm1fu4zb.bx.internal.cloudapp.net

Tunnel adapter Teredo Tunneling Pseudo-Interface:

  Connection-specific DNS Suffix . :
  IPv6 Address . . . . . : 2001:0:34f1:8072:3821:194:3f57:ffffb
  Link-local IPv6 Address . . . . . : fe80::3821:194:3f57:ffffb%8
  Default Gateway . . . . . : ::

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

Pinging 10.0.0.4 with 32 bytes of data:
Reply from 10.0.0.4: bytes=32 time=27ms TTL=128
Reply from 10.0.0.4: bytes=32 time=27ms TTL=128
Reply from 10.0.0.4: bytes=32 time=27ms TTL=128
Reply from 10.0.0.4: bytes=32 time=29ms TTL=128
Reply from 10.0.0.4: bytes=32 time=28ms TTL=128
Reply from 10.0.0.4: bytes=32 time=28ms TTL=128
Reply from 10.0.0.4: bytes=32 time=78ms TTL=128
Reply from 10.0.0.4: bytes=32 time=28ms TTL=128
Reply from 10.0.0.4: bytes=32 time=28ms TTL=128
Reply from 10.0.0.4: bytes=32 time=28ms TTL=128
Reply from 10.0.0.4: bytes=32 time=26ms TTL=128
Reply from 10.0.0.4: bytes=32 time=30ms TTL=128
Reply from 10.0.0.4: bytes=32 time=39ms TTL=128
Reply from 10.0.0.4: bytes=32 time=63ms TTL=128
Reply from 10.0.0.4: bytes=32 time=29ms TTL=128
Reply from 10.0.0.4: bytes=32 time=27ms TTL=128
Reply from 10.0.0.4: bytes=32 time=27ms TTL=128
Reply from 10.0.0.4: bytes=32 time=26ms TTL=128
Reply from 10.0.0.4: bytes=32 time=30ms TTL=128
Reply from 10.0.0.4: bytes=32 time=27ms TTL=128
```

**After Activity Completes, Delete The Resources and Everything. Delete Takes 15 to 20 minutes as Gateway Deletion takes that much time.**