

# Assignment 1

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## **Tasks To Be Performed:**

1. Create a virtual network in West US
2. Create another virtual network in South India
3. Deploy virtual machine in West US with the virtual network in West US
4. Deploy virtual machine in South India inside virtual network in South India
5. Create VNet-VNet peering to connect West US and South India VM
6. Check this by pinging VM1 to VM2 via ping command using private IP address


# Create Resource group

## Search for VNET – Select Virtual networks- create

[Home](#) > [Virtual networks](#) >

### Create virtual network ...

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

benefits of Azure's infrastructure such as scale, availability, and isolation.  
[Learn more.](#) 

#### Project details

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

Subscription \*

Free Trial 


Resource group \*

12-01-24 

[Create new](#)

#### Instance details

Virtual network name \*

Vnet-westus 

Region ⓘ \*

(US) West US 

[Deploy to an edge zone](#)

[Previous](#)

[Next](#)

[Review + create](#)

Edit the name of the default subnet. In the same way create VNET in south India region and rename the subnet as subnet –South India.

Home > Virtual networks >

## Create virtual network

Basics Security IP addresses Tags Review + create

virtual network address space into smaller ranges for use by your applications. When you deploy resources, assigns the resource an IP address from the subnet. [Learn more](#)

Add IPv4 address space

10.0.0.0/16

10.0.0.0 10.66.0.0/16 /16

10.0.0.0 - 10.0.255.255

65,536 addresses

+ Add a subnet 10.51.0.0/16

Subnets	IP address range	Size	NAT gateway
default ✓	10.0.0.0 - 10.0.0.255	/24 (256 addresses)	-

Delete default subnet

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

Previous

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Review + create

## Edit subnet

Select an address space and configure your subnet. You can customize a default subnet or select from subnet templates if you plan to add select services later. [Learn more](#)

Subnet purpose ⓘ

Default

Name \* ⓘ

Subnet-westus ✓

Subnet-southindia

IPv4

Include an IPv4 address space



IPv4 address range ⓘ

10.0.0.0/16

10.0.0.0 - 10.0.255.255

Starting address \* ⓘ

10.0.0.0

Size ⓘ

/24 (256 addresses)

22, 24

Subnet address range ⓘ

10.0.0.0 - 10.0.0.255

IPv6

Include an IPv6 address space



This virtual network has no IPv6 address ranges.

Private subnet PREVIEW

Private subnets enhance security by not providing default outbound access. To enable outbound connectivity for virtual machines to access the internet, it is necessary to explicitly grant outbound access. A NAT gateway is the recommended way to provide outbound connectivity for virtual machines in the subnet. [Learn more](#)

Enable private subnet



Save

Cancel

[Home](#) >

## Virtual networks

Default Directory



[+ 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](#)

Showing 1 to 2 of 2 records.

No grouping

List view

<input type="checkbox"/> Name ↑↓	Resource group ↑↓	Location ↑↓	Subscription ↑↓	
<input type="checkbox"/> <a href="#">Vnet-southindia</a> ✓	12-01-24	South India	Free Trial	...
<input type="checkbox"/> <a href="#">Vnet-westus</a> ✓	12-01-24	West US	Free Trial	...

Create the VM in west us region by default it choose the available VNET in west us region and in the same way create VM in south India region and the same VNET in that region would also attached.

[Home](#) > [Virtual machines](#) >

## Create a virtual machine

[Basics](#) [Disks](#) [Networking](#) [Management](#) [Monitoring](#) [Advanced](#) [Tags](#) [Review + create](#)

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

[Learn more](#)

### Network interface

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

Virtual network \* ⓘ

Vnet-westus ✓

[Create new](#)

Subnet \* ⓘ

Subnet-westus (10.0.0.0/24) ✓

[Manage subnet configuration](#)

Public IP ⓘ

(new) WestusVM-ip

[Create new](#)

NIC network security group ⓘ

☐ None

☒ Basic

☐ Advanced

Public inbound ports \* ⓘ

☐ None

☒ Allow selected ports

Select inbound ports \*

RDP (3389)

[Review + create](#) ✓

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## Virtual machines

Default Directory

[+ Create](#) [↔ Switch to classic](#) [🕒 Reservations](#) [⚙️ Manage view](#) [🔄 Refresh](#) [⬇ Export to CSV](#) [🔗 Open query](#) [🏷 Assign tags](#) [▶ Start](#) [↺ Restart](#) [☐ Stop](#) [🗑 Delete](#) [☰ Services](#) [⋮](#)

Filter for any field...

Subscription equals all

Type equals all

Resource group equals all X

Location equals all X

[+ Add filter](#)

Showing 1 to 2 of 2 records.

No grouping

List view

<input type="checkbox"/> Name ↑↓	Type ↑↓	Subscription ↑↓	Resource group ↑↓	Location ↑↓	Status ↑↓	Operating system ↑↓	Size ↑↓	Public IP address ↑↓	
<input type="checkbox"/> SouthindiaVM	Virtual machine	Free Trial	12-01-24	South India	Running	Linux	Standard_B1s	20.219.88.31	1
<input type="checkbox"/> WestusVM	Virtual machine	Free Trial	12-01-24	West US	Running	Linux	Standard_B1s	13.91.177.187	1

## Move inside VNET- search for peering - create

 Vnet-westus  
Virtual network

## Settings

Peerings

[→ Move](#) [🗑 Delete](#) [🔄 Refres](#)

## Essentials

Resource group [\(move\)](#)[12-01-24](#)

Home &gt; Virtual networks &gt; Vnet-westus | Peerings &gt;

## Add peering

Vnet-westus

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

This virtual network

Peering link name \*

westus-to-sothindia

☒ Allow 'Vnet-westus' to access the peered virtual network ⓘ☒ Allow 'Vnet-westus' to receive forwarded traffic from the peered virtual network ⓘ☐ Allow gateway in 'Vnet-westus' to forward traffic to the peered virtual network ⓘ☐ Enable 'Vnet-westus' to use the peered virtual networks' remote gateway ⓘ

Remote virtual network

Peering link name \*

southindia-to-westus

Virtual network deployment model ⓘ

☒ Resource manager☐ Classic☐ I know my resource ID ⓘ

We have to create a loop then peering connection would estb.

☐ I know my resource ID ⓘ

Subscription \* ⓘ

Free Trial

Virtual network \* ⓘ

Vnet-sothindia ✓

☒ Allow 'Vnet-sothindia' to access 'Vnet-westus' ⓘ

☒ Allow 'Vnet-sothindia' to receive forwarded traffic from 'Vnet-westus' ⓘ

☐ Allow gateway in 'Vnet-sothindia' to forward traffic to 'Vnet-westus' ⓘ

☐ Enable 'Vnet-sothindia' to use 'Vnet-westus's' remote gateway ⓘ

Add ✓

Two peering connections were made in both VNET.

+ Add Refresh Sync

Filter by name...

Peering status == all

<input type="checkbox"/> Name ↑↓	Peering status ↑↓	Peer ↑↓	Gateway transit ↑↓	
<input type="checkbox"/> southindia-to-westus	Connected	Vnet-westus	Disabled	...

+ Add Refresh Sync

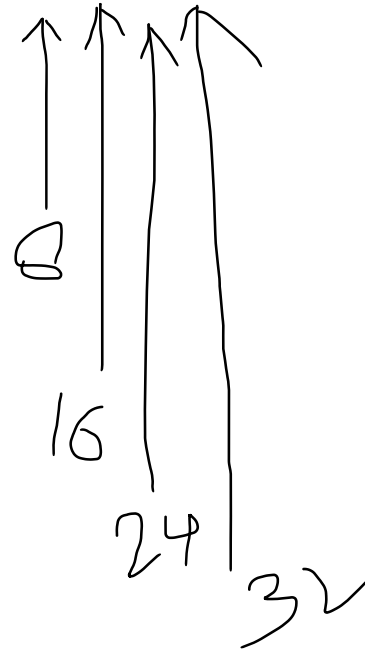
Filter by name...

Peering status == all

<input type="checkbox"/> Name ↑↓	Peering status ↑↓	Peer ↑↓	Gateway transit ↑↓	
<input type="checkbox"/> westus-to-sothindia	Connected	Vnet-sothindia	Disabled	...

# Address space configuration

10.0.0.0/8,16,24,32



We can configure no from 0-255

If Range is 8 then 10 can be configure only.

16	0 (Second place only)
24	0 (Third place only)
32	0 (Last place only)

If address space overlaps we cannot establish peering connection between two VNET.

Connect to both Virtual machines-copy the private IP of both and paste them into one another VM – try to ping.

```
siddharth@SothindiaVM:~$ ping 10.66.0.4 ✓
PING 10.66.0.4 (10.66.0.4) 56(84) bytes of data.
64 bytes from 10.66.0.4: icmp_seq=1 ttl=64 time=202 ms
64 bytes from 10.66.0.4: icmp_seq=2 ttl=64 time=202 ms
64 bytes from 10.66.0.4: icmp_seq=3 ttl=64 time=202 ms
64 bytes from 10.66.0.4: icmp_seq=4 ttl=64 time=202 ms
^C
--- 10.66.0.4 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3005ms
rtt min/avg/max/mdev = 201.508/201.692/202.029/0.199 ms
siddharth@SothindiaVM:~$
```

Private IP of west us.

```
siddharth@WestusVM:~$ ping 10.51.0.4 ✓
PING 10.51.0.4 (10.51.0.4) 56(84) bytes of data.
64 bytes from 10.51.0.4: icmp_seq=1 ttl=64 time=206 ms
64 bytes from 10.51.0.4: icmp_seq=2 ttl=64 time=201 ms
64 bytes from 10.51.0.4: icmp_seq=3 ttl=64 time=201 ms
64 bytes from 10.51.0.4: icmp_seq=4 ttl=64 time=201 ms
^C
--- 10.51.0.4 ping statistics ---
5 packets transmitted, 4 received, 20% packet loss, time 4005ms
rtt min/avg/max/mdev = 201.138/202.414/205.909/2.019 ms
siddharth@WestusVM:~$
```

Private IP of south India.



# Assignment 2

## **Tasks To Be Performed:**

1. Create a VM in West US
2. Assign a Static IP address to the VM

In Networking select none public ip – create new one .

[Home](#) > [Virtual machines](#) >

## Create a virtual machine ...

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

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

[Learn more](#)

### Network interface

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

Virtual network *	(new) Staticip2-vnet
	<a href="#">Create new</a>
Subnet *	(new) default (10.0.0.0/24)
Public IP	None
	<a href="#">Create new</a>
NIC network security group	<input type="radio"/> None
	<input checked="" type="radio"/> Basic
	<input type="radio"/> Advanced
Public inbound ports *	<input type="radio"/> None
	<input checked="" type="radio"/> Allow selected ports
Select inbound ports *	SSH (22)

[Review + create](#)

[< Previous](#)

[Next : Management >](#)

## Create public IP address ×

Name *	newstaticip
SKU *	<input checked="" type="radio"/> Basic <input type="radio"/> Standard
Assignment	<input type="radio"/> Dynamic <input checked="" type="radio"/> Static

[OK](#)

## Before stop the Machine

 Connect  Start  Restart  Stop  Hibernate (preview)  Capture  Delete  Refresh ...

### ^ Essentials

Resource group ([move](#))  
[sid-rg2](#)

Status  
Running

Location  
West US

Operating system  
Linux

Size  
Standard B1s (1 vcpu, 1 GiB memory)

Public IP address  
[20.245.159.221](#)

## After starting the Machine

 Connect  Start  Restart  Stop  Hibernate (preview)  Capture  Delete  Refresh

### ^ Essentials

Resource group ([move](#))  
[sid-rg2](#)

Status  
Running

Location  
West US

Operating system  
Linux

Size  
Standard B1s (1 vcpu, 1 GiB memory)

Public IP address  
[20.245.159.221](#)

# Assignment 3

## **Tasks To Be Performed:**

1. Use the previously created VM
2. Created a NIC
3. Attach NIC to the previously created VM

# Create network interface ...

Basics Tags Review + create

Create a network interface and attach it to a virtual machine. A network interface enables a virtual machine to communicate with Internet, Azure, and on-premises resources. [Learn more about network interface](#)

## Project details

Subscription \*

Free Trial

Resource group \*

sid-rg2

Create new

## Instance details

Name \*

Staticip-NIC2

Region \*

West US

Virtual network \* ⓘ

(New) vnet-westus-1 (sid-rg2)

VNET WESTUS

Edit virtual network

Subnet \* ⓘ

(New) snet-westus-1

Edit subnet

10.1.0.0 - 10.1.0.255 (256 addresses)

IP version

☒ IPv4
 ☐ IPv4 and IPv6

Private IP address assignment

☒ Dynamic
 ☐ Static

Review + create

< Previous

Next : Tags >

[Download a template for automation](#)

We cannot attach the another NIC while VM is in running state, first stop the VM – Network settings- Attach Nic .

Attach network interface Detach network interface View topology Troubleshoot

Network interface / IP configuration  
staticip2835 (primary) / ipconfig1 (primary)

## Essentials

Network interface staticip2835 Load balancers 0 (Configure)

Attach network interface Detach network interface View topology Troubleshoot 1

Network interface / IP configuration  
NIC-2 / ipconfig1 (primary)

## Essentials

While creating the new NIC you always have to choose the same Virtual Network in which VM is launched otherwise the new created NIC not visible to attach to the VM.

# Assignment 4

## **Tasks To Be Performed:**

1. Use the previously created Linux VM
2. Install Apache2 on this VM
3. Create a Network Security Group to the subnet in which VM has been deployed
4. Open NSG rules for subnet and VM on port 80
5. Verify if you can see the Apache2 page

As we don't enable the port 80 so we cannot able to access the website so create new NSG group and open port 80. Search for NSG and create.

Home > Network security groups >

### Create network security group

Basics Tags Review + create

Project details

Subscription \* Free Trial

Resource group \* 17-01-24  
[Create new](#)

Instance details

Name \* new-nsg ✓

Region \* West US 3

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

There is two ways of attaching NSG to NIC  
First stop the VM go inside NIC then NSG – choose NSG and save  
Second open NSG – NIC – associate.

Home > Network interfaces > new-nic3

### Network interfaces

Default Directory

+ Create ⚙ Manage view ⌵ ...

Filter for any field...

Name ↑↓

- linuxvm545
- new-nic2
- new-nic3 ✓

#### new-nic3 | Network security group

Network interface

Search

Overview

Activity log

Access control (IAM)

Tags

Settings

- IP configurations
- DNS servers

Save Discard

Network security group ⓘ

new-nsg ✓

None

basicNsgnew-nic3

linuxVM-nsg

new-nsg

## Network security g...

Default Directory

+ Create ⚙️ Manage view ▾ ...

Filter for any field...

Name ↑↓

basicNsgnew-nic3

linuxVM-nsg

new-nsg ✓

## new-nsg | Network interfaces

Network security group

Search

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Associate

Refresh

Dissociate

Search network interfaces

Name ↑↓

Public IP address

new-nic3 ✓

## new-nsg | Inbound security rules

Network security group

Search

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Inbound security rules ✓

Outbound security rules

Network interfaces

+ Add 👁️ Hide default rules

Network security group security to allow or deny the traffic. A security rule can override them with rules that

Filter by name

Port == all

Protocol

Priority ↑↓

65000

65001

65500

## Associate network interface

new-nsg

Network interface associations \* ⓘ

## Add inbound security rule

new-nsg

Source ⓘ

Any

Source port ranges \* ⓘ

\*

Destination ⓘ

Any

Service ⓘ

HTTP ✓

Destination port ranges ⓘ

80

Protocol

☐ Any

☒ TCP

☐ UDP

☐ ICMP

Action

☒ Allow

☐ Deny

Priority \* ⓘ

100

Name \*

AllowAnyHTTPInbound ✓

Description


Add ✓

Cancel

Give feedback



Attach newly created NSG to both of your NIC open http and SSH port – copy the IP address of first NIC – connect to your VM – install apache2 server- browse the public IP of First NIC .



# Apache2 Ubuntu Default Page

## It works!

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at `/var/www/html/index.html`) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

## Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully documented in `/usr/share/doc/apache2/README.Debian.gz`**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manual** if the `apache2-doc` package was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:

```
/etc/apache2/  
|-- apache2.conf  
|   |-- ports.conf  
|-- mods-enabled  
|   |-- *.load  
|   |-- *.conf  
|-- conf-enabled  
|   |-- *.conf  
|-- sites-enabled  
|   |-- *.conf
```

# Assignment 5

## **Tasks To Be Performed:**

1. Use the previously created Apache2 VM
2. Get a free domain from freenom.com
3. Use Azure DNS to point this free domain to your VMs IP

DNS help to access the website using name of the website instead of using the IP addresses. E.g. Google.com  
For creating the Domain name service – click on DNS Name- name the DNS

Linux-vm

Virtual machine

Search

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Connect

Connect

Bastion

Networking

Connect

Start

Restart

Stop

Hibernate (preview)

Capture

Delete

Refresh

Essentials

Resource group (move)

18-01-24

Status

Running

Location

East US

Subscription (move)

Free Trial

Subscription ID

dfe5760d-8ca2-4f3e-af83-62c16886c3b7

Operating system

Linux (ubuntu 20.04)

Size

Standard B1s (1 vcpu, 1 GiB memory)

Public IP address

20.185.218.115

Virtual network/subnet

Linux-vm-vnet/default

DNS name

Not configured

Health state

-

JSON View

Save Discard Refresh

This public IP address can't be updated because it is associated to the IP configuration 'ipconfig1', in the network interface 'linux-vm298'.

IP address assignment

☐ Dynamic ☒ Static

IP address

20.185.218.115

Idle timeout (minutes)

4

DNS name label (optional)

azurelinux

.eastus.cloudapp.azure.com

You can use the IP address as your 'A' DNS record or DNS label as your 'CNAME' record. [Learn more about adding a custom domain to this IP address](#)

Alias record sets

Create an alias record in Azure DNS. [Learn more](#)

+ Create alias record

Subscription	DNS zone	Name	Type	TTL
--------------	----------	------	------	-----

## ^ Essentials

[JSON View](#)

Resource group ([move](#))  
18-01-24

Status  
Running

Location  
East US

Subscription ([move](#))  
[Free Trial](#)

Subscription ID  
dfe5760d-8ca2-4f3e-af83-62c16886c3b7

Operating system  
Linux (ubuntu 20.04)

Size  
Standard B1s (1 vcpu, 1 GiB memory)


Public IP address  
[20.185.218.115](#)

Virtual network/subnet  
[Linux-vm-vnet/default](#)

DNS name  
[azurelinux.eastus.cloudapp.azure.com](#) ✓

Health state  
-

Copy the DNS link and browse.



## Apache2 Ubuntu Default Page

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|   `-- ports.conf
    
```