

## CREATE THREE VPCs IN THREE DIFFERENT REGIONS AND CONNECT THE VPCs USING TRANSIT GATEWAY

### ❖ What is Amazon VPC?

With Amazon Virtual Private Cloud (Amazon VPC), you can launch AWS resources in a logically isolated virtual network that you've defined. This virtual network closely resembles a traditional network that you'd operate in your own data centre, with the benefits of using the scalable infrastructure of AWS.

### ❖ What is Transit Gateway?

A transit gateway is a network transit hub that you can use to interconnect your virtual private clouds (VPCs) and on-premises networks. As your cloud infrastructure expands globally, inter region peering connects transit gateways together using the AWS global infrastructure.

### ❖ Create VPCs in THREE DIFFERENT REGIONS:

1. Log in to your AWS account & select Ohio region & do search for VPC in the search box.
2. Click on create VPC & select VPC AND MORE, go down click on create VPC.
3. After that choose CALIFORNIA & OREGON and create VPCs in those regions.
4. Follow the steps mentioned in below snapshots.



3. Below snapshots shows the VPCs that are created in CALIFORNIA & OREGON.



### ❖ Create Transit Gateway in three regions:

1. Go to transit gateway and select “Create Transit Gateway”.
2. Now create transit gateway in three different regions.
3. Snapshots of transit gateway are attached below.

Transit gateways | VPC Console

us-east-2.console.aws.amazon.com/vpconsole/home?region=us-east-2#TransitGateways:

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**VPC dashboard**

EC2 Global View

Filter by VPC

**Virtual private cloud**

- Your VPCs
- Subnets
- Route tables
- Internet gateways
- Egress-only Internet gateways
- DHCP option sets
- Elastic IPs
- Managed prefix lists
- Endpoints
- Endpoint services
- NAT gateways
- Peering connections

**Security**

- Network ACLs
- Security groups

You can visualize and monitor your Transit Gateway(s) from the [AWS Network Manager](#). Register your Transit Gateway by creating a [global network](#) to get started.

**Transit gateways (1)** info

Find transit gateway by attribute or tag

<input type="checkbox"/>	Name	Transit gateway ID	State
<input type="checkbox"/>	transit-gateway-1	tgw-01c676d572bb298f6	Available

Select a transit gateway

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Transit gateways | VPC Console

us-west-1.console.aws.amazon.com/vpconsole/home?region=us-west-1#TransitGateways:

Gmail YouTube Maps

**VPC dashboard**

EC2 Global View

Filter by VPC

**Virtual private cloud**

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**Security**

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**Transit gateways (1)** info

Find transit gateway by attribute or tag

<input type="checkbox"/>	Name	Transit gateway ID	State
<input type="checkbox"/>	transit-gateway-2	tgw-03c246c0198d56952	Available

Select a transit gateway

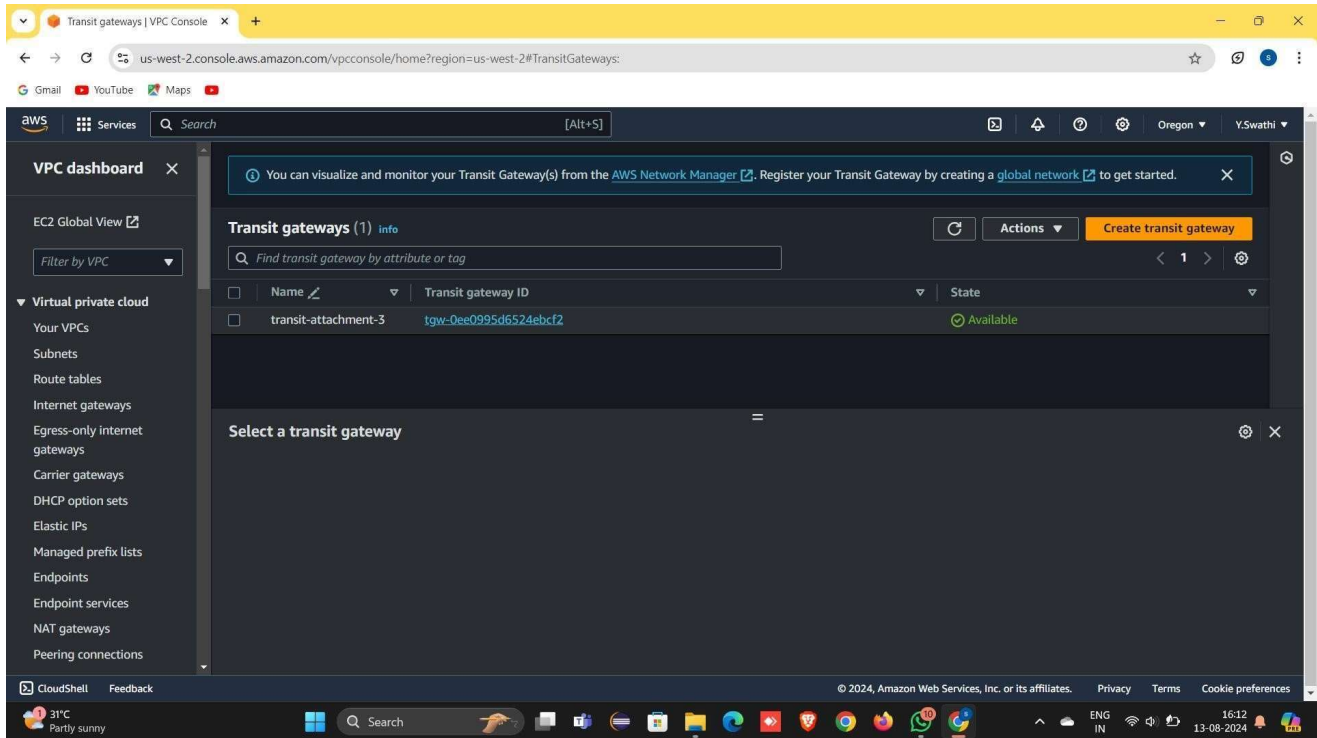
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## ❖ Create Transit Gateway Attachment in THREE Regions:

1. Go to transit gateway attachment & Create “Transit Gateway Attachment” & attach to transit gateway.
2. while creating transit gateway attachment for single region, select attachment  
Type attach VPC & for two or more regions give PEERING CONNECTION.
3. After sending a request from one region to another region, you must accept the transit gateway attachment request then only it will be available.
4. some snapshots attached below.

 Services

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# Create transit gateway attachment [Info](#)

A transit gateway (TGW) is a network transit hub that interconnects attachments (VPCs and VPNs) within the same AWS account or across AWS accounts.

## Details

Name tag - optional

Creates a tag with the key set to Name and the value set to the specified string.

Transit gateway ID [Info](#)

Attachment type [Info](#)

## Peering connection attachment

Select and configure your peering connection attachment.

Account [Info](#)

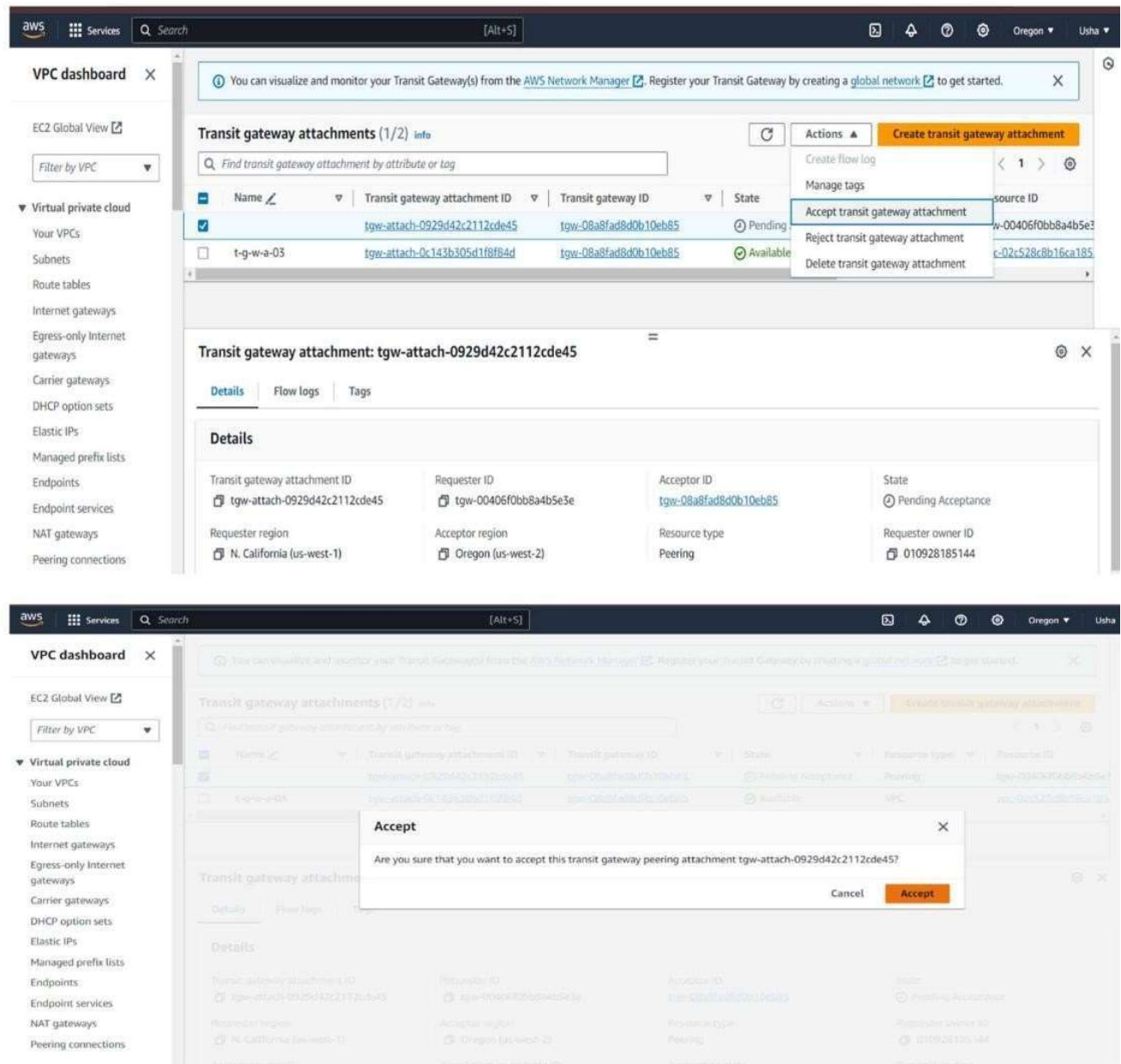
☒ My account

☐ Other account

Region [Info](#)

Transit gateway (accepter) [Info](#)

VC



5. Below snapshots shows that transit gateway attachment from region – region.  
i.e., Ohio-California, California-Oregon, Oregon-Ohio.

Transit gateway attachments | v x +

us-east-2.console.aws.amazon.com/vpconsole/home?region=us-east-2#TransitGatewayAttachments:

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AWS Verified Access

Verified Access instances [New](#)

Verified Access trust providers [New](#)

Verified Access groups [New](#)

Verified Access endpoints [New](#)

Transit gateways

Transit gateway attachments

Transit gateway policy tables

Transit gateway route tables

Transit gateway multicast

Traffic Mirroring

Mirror sessions

Mirror targets

Mirror filters

VPC Lattice

Getting started [New](#)

Service networks [New](#)

Services [New](#)

Target groups [New](#)

You can visualize and monitor your Transit Gateway(s) from the [AWS Network Manager](#). Register your Transit Gateway by creating a [global network](#) to get started.

Transit gateway attachments (3) info

Find transit gateway attachment by attribute or tag

Name	Transit gateway attachment ID	Transit gateway ID	State	Resource type	Resource ID	Association route table ID	Association state
ohio-california	tgw-attach-00940bc9f9d8a2bb3	tgw-01c676d372bb298f6	Available	Peering	tgw-03c246c0198d36952	tgw-rtb-09f57282c52f48c94	Associated
	tgw-attach-0a21c6b9d6ea9eb8	tgw-01c676d372bb298f6	Available	Peering	tgw-0ee0995d6524ebcf2	tgw-rtb-09f57282c52f48c94	Associated
ohio trans	tgw-attach-0ac59b24a22064d7d	tgw-01c676d372bb298f6	Available	VPC	vpc-0fa8c189f49e80518	tgw-rtb-09f57282c52f48c94	Associated

Select a transit gateway attachment

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Search

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Transit gateway attachments | v x +

us-west-1.console.aws.amazon.com/vpconsole/home?region=us-west-1#TransitGatewayAttachments:

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AWS Virtual private network (VPN)

Customer gateways

Virtual private gateways

Site-to-site VPN connections

Client VPN endpoints

AWS Verified Access

Verified Access instances [New](#)

Verified Access trust providers [New](#)

Verified Access groups [New](#)

Verified Access endpoints [New](#)

Transit gateways

Transit gateways

Transit gateway attachments

Transit gateway policy tables

Transit gateway route tables

Transit gateway multicast

Traffic Mirroring

Mirror sessions

Mirror targets

You can visualize and monitor your Transit Gateway(s) from the [AWS Network Manager](#). Register your Transit Gateway by creating a [global network](#) to get started.

Transit gateway attachments (3) info

Find transit gateway attachment by attribute or tag

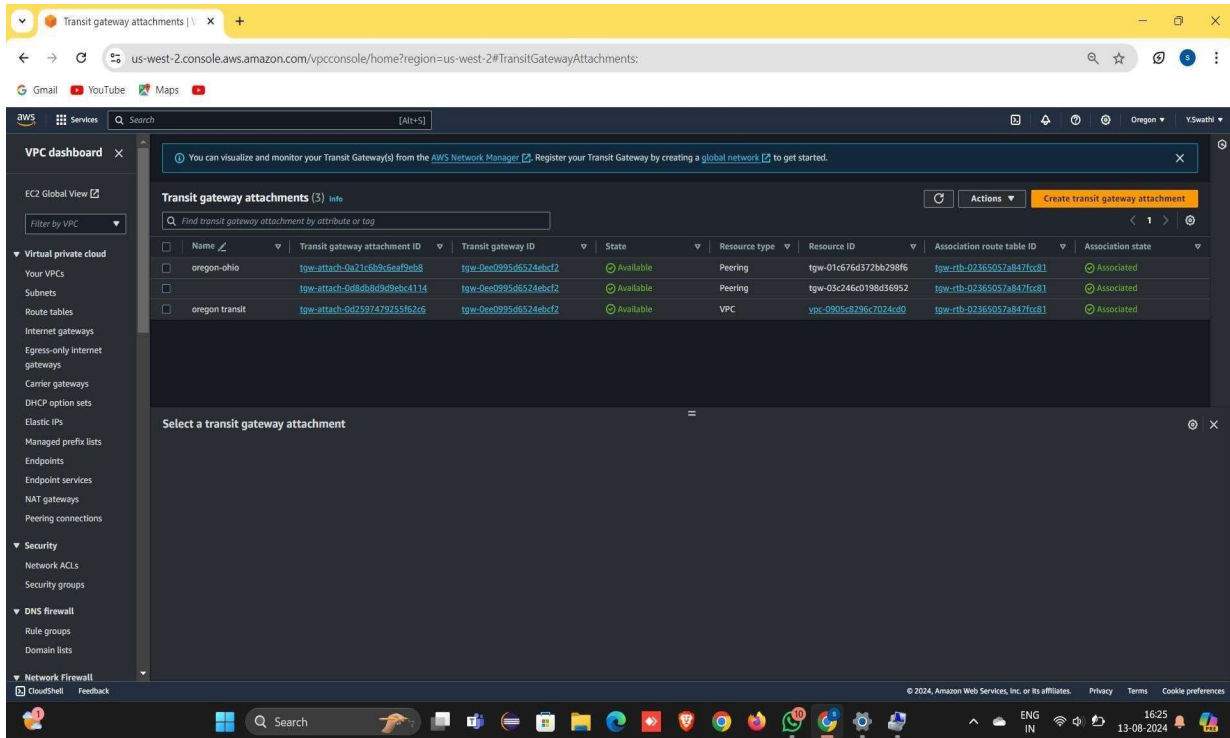
Name	Transit gateway attachment ID	Transit gateway ID	State	Resource type	Resource ID	Association route table ID	Association state
	tgw-attach-00940bc9f9d8a2bb3	tgw-03c246c0198d36952	Available	Peering	tgw-01c676d372bb298f6	tgw-rtb-04d254694b89b10c6	Associated
california-oregon	tgw-attach-0d8db8d9d9ebc4114	tgw-03c246c0198d36952	Available	Peering	tgw-0ee0995d6524ebcf2	tgw-rtb-04d254694b89b10c6	Associated
california transit	tgw-attach-0bbad9d64d9b4e9a	tgw-03c246c0198d36952	Available	VPC	vpc-0657f9e474e359c34	tgw-rtb-04d254694b89b10c6	Associated

Select a transit gateway attachment

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## ❖ Create EC2 instance:

1. create three EC2 Instance for three VPCs.
2. Go to instance –launch instance – create key pair — network(edit) — select security group - launch instance.
3. some EC2 snapshots are attached below.



Instances | EC2 | us-east-2

us-east-2.console.aws.amazon.com/ec2/home?region=us-east-2#Instances:instanceState=running

aws Services Search [Alt+S]

EC2 Dashboard EC2 Global View Events

▼ Instances

- Instances
- Instance Types
- Launch Templates
- Spot Requests
- Savings Plans
- Reserved Instances
- Dedicated Hosts
- Capacity Reservations

▼ Images

- AMIs
- AMI Catalog

▼ Elastic Block Store

- Volumes
- Snapshots
- Lifecycle Manager

Instances (1) info

Find Instance by attribute or tag (case-sensitive)

Instance state = running Clear filters

Connect Instance state Actions Launch instances

<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
<input type="checkbox"/>	ohio server	i-0820149636d428a6f	Running	t2.micro	2/2 checks passed	View alarms	us-east-2a	ec2-3-147-62-83

Select an instance

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Instances | EC2 | us-west-1

us-west-1.console.aws.amazon.com/ec2/home?region=us-west-1#Instances:instanceState=running

aws Services Search [Alt+S]

EC2 Dashboard EC2 Global View Events

▼ Instances

- Instances
- Instance Types
- Launch Templates
- Spot Requests
- Savings Plans
- Reserved Instances
- Dedicated Hosts
- Capacity Reservations

▼ Images

- AMIs
- AMI Catalog

▼ Elastic Block Store

- Volumes
- Snapshots
- Lifecycle Manager

▼ Network & Security

- Security Groups

Instances (1) info

Find Instance by attribute or tag (case-sensitive)

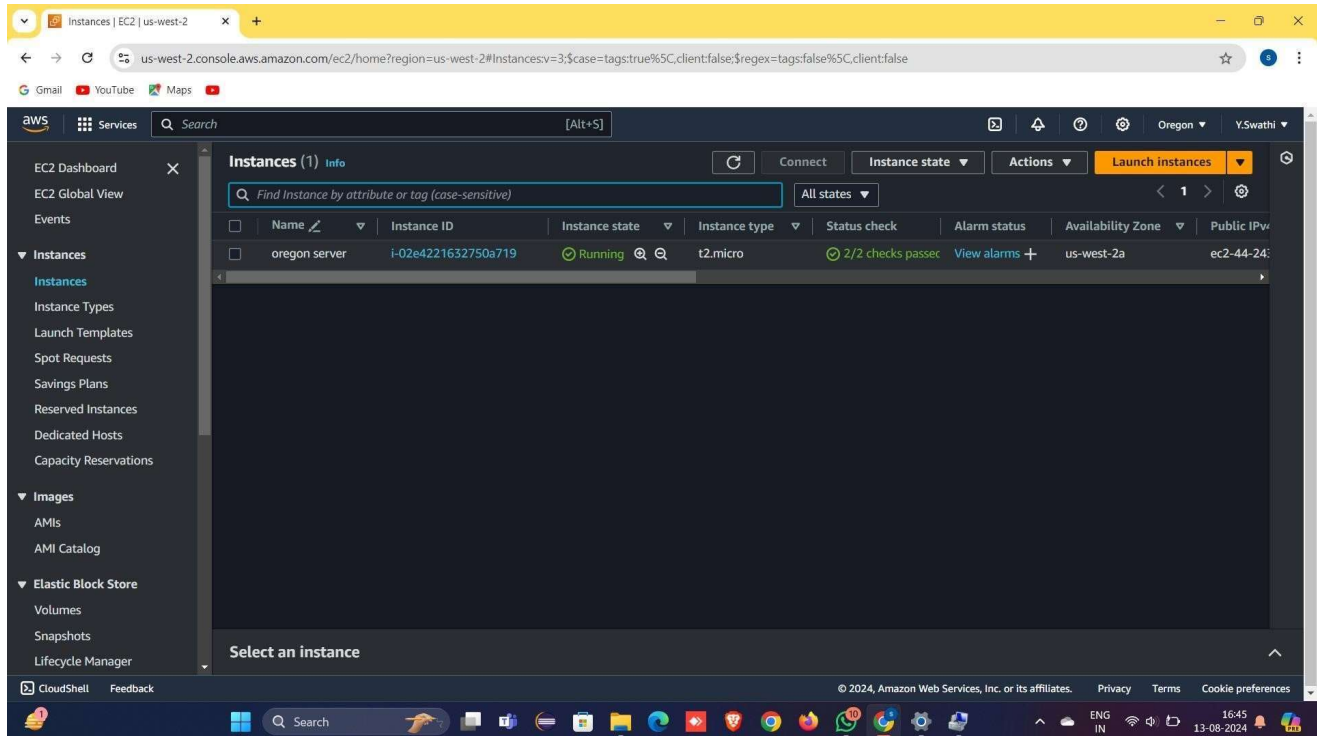
Instance state = running Clear filters

Connect Instance state Actions Launch instances

<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
<input type="checkbox"/>	california server	i-01a0e14738c26ab9e	Running	t2.micro	2/2 checks passed	View alarms	us-west-1b	ec2-54-153-64-229.us-...

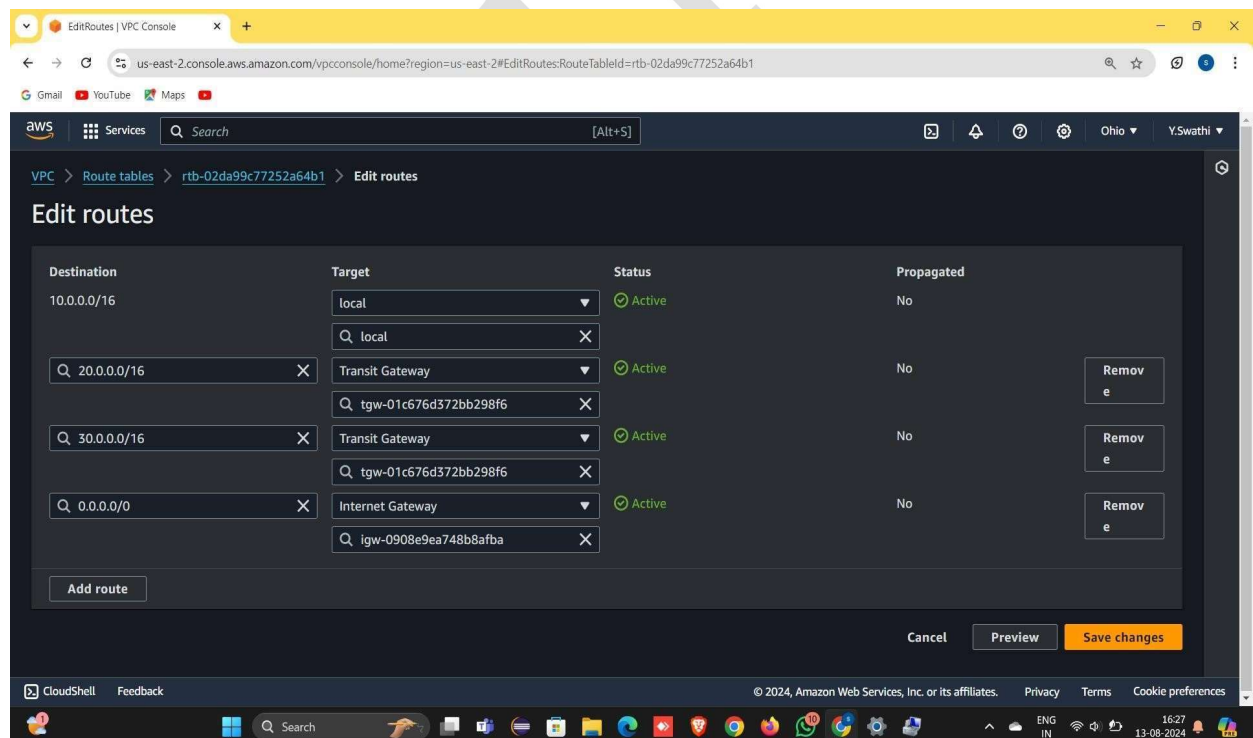
Select an instance

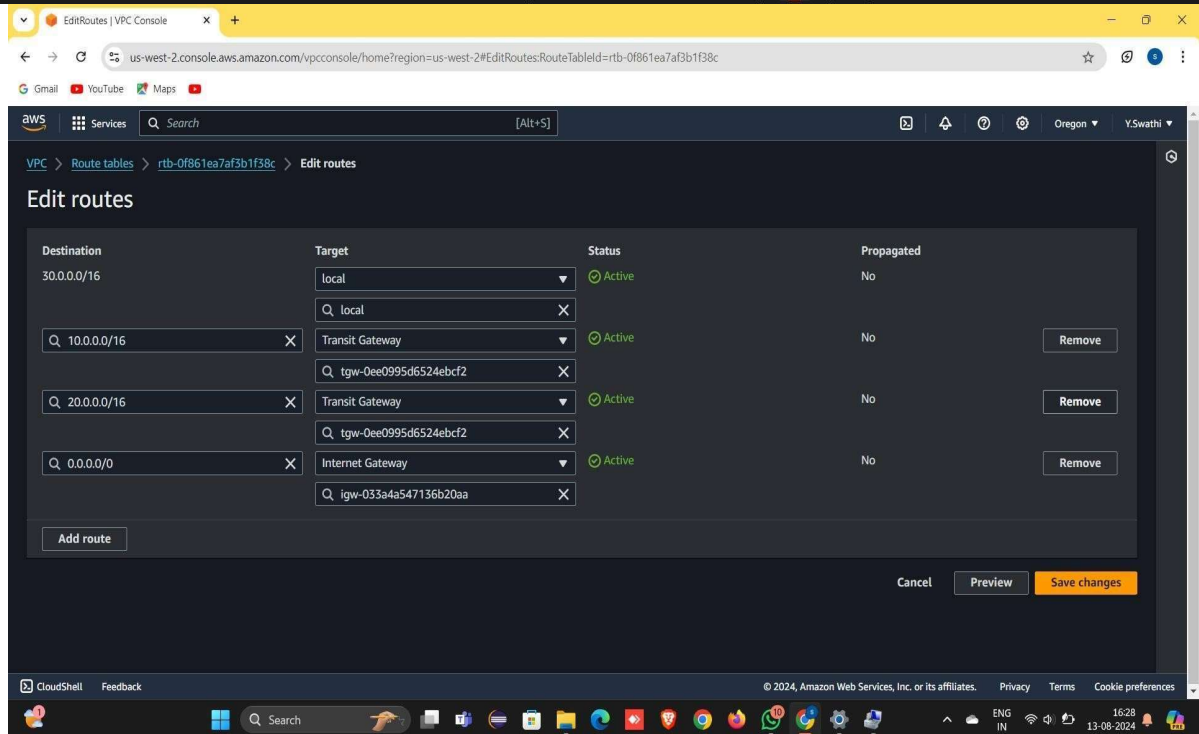
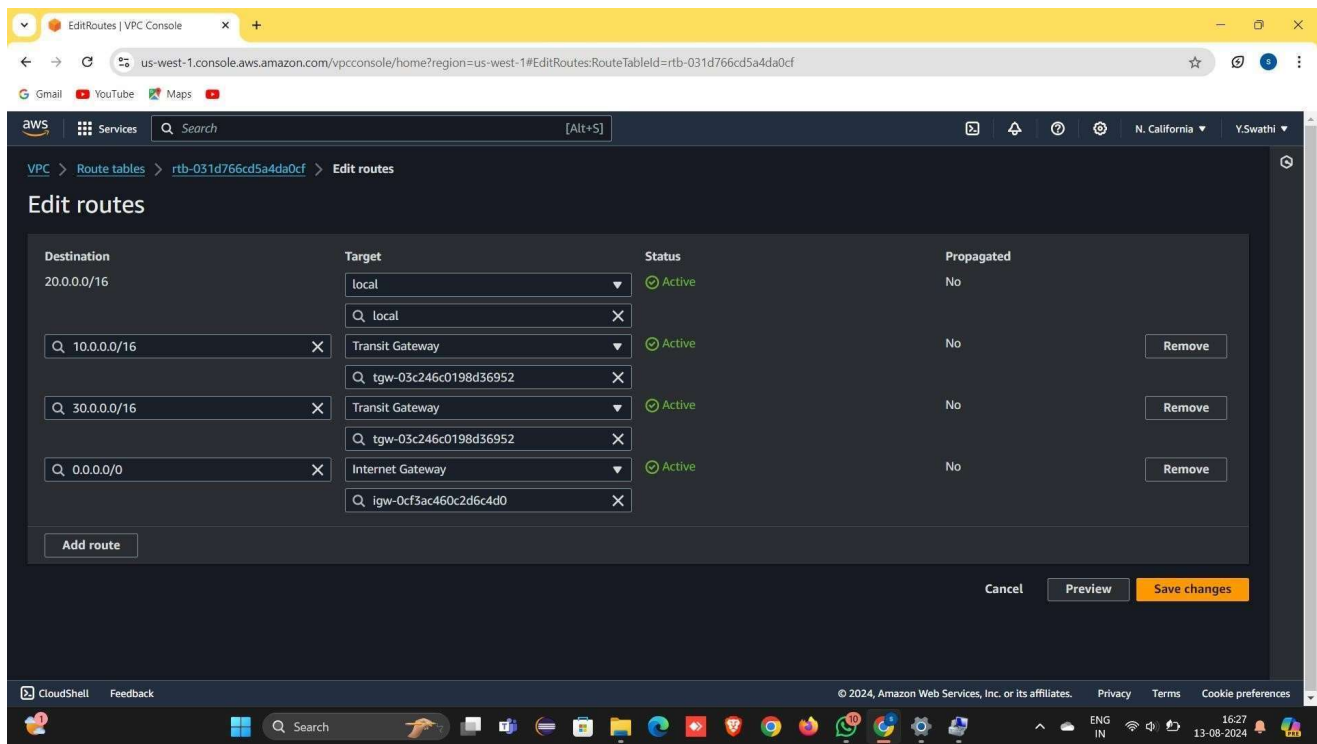
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4. After creating EC2 Instances, go to route tables & edit the routes & save changes.

5. Some snapshots of route tables are given below.





6. Goto the EC2 Instance in different regions click on connect - copy The SSH and paste it in git bash & connect.

7. Directly connect to the server through EC2 Instance.

❖ **OUTPUT:**

[illegible]

Instance details | EC2 x Instance details | EC2 x Instance details | EC2 x Instance details | EC2 x EC2 Instance Conne x EC2 Instance Conne x EC2 Instance Conne x + -

us-east-2.console.aws.amazon.com/ec2-instance-connect/ssh?region=us-east-2&connType=standard&instanceId=i-0820149636d428a6f&osUser=ec2-user&sshPort=22#/?

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```
Active: active (running) since Tue 2024-08-13 05:48:44 UTC; 5h 42min ago
Process: 27136 ExecStartPre=/usr/bin/rm -f /run/nginx.pid (code=exited, status=0/SUCCESS)
Process: 27137 ExecStartPre=/usr/sbin/nginx -t (code=exited, status=0/SUCCESS)
Process: 27138 ExecStart=/usr/sbin/nginx (code=exited, status=0/SUCCESS)
Main PID: 27139 (nginx)
Tasks: 2 (limit: 1112)
Memory: 2.2M
CPU: 61ms
CGroup: /system.slice/nginx.service
└─27139 "nginx: master process /usr/sbin/nginx"
    └─27140 "nginx: worker process"
```

Aug 13 05:48:44 ip-10-0-10-199.us-east-2.compute.internal systemd[1]: Starting nginx.service - The nginx HTTP and reverse proxy server...

Aug 13 05:48:44 ip-10-0-10-199.us-east-2.compute.internal nginx[27137]: nginx: the configuration file /etc/nginx/nginx.conf syntax is ok

Aug 13 05:48:44 ip-10-0-10-199.us-east-2.compute.internal nginx[27137]: nginx: configuration file /etc/nginx/nginx.conf test is successful

Aug 13 05:48:44 ip-10-0-10-199.us-east-2.compute.internal systemd[1]: Started nginx.service - The nginx HTTP and reverse proxy server.

[root@ip-10-0-10-199 html]# curl 54.153.64.229:80

this is a california server

[root@ip-10-0-10-199 html]# curl 44.243.17.227:80

this is a oregon server

[root@ip-10-0-10-199 html]# curl 10.0.10.199:80

this is a ohio server

[root@ip-10-0-10-199 html]#

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```
us-west-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=us-west-1&connType=standard&instanceId=i-01a0e14738c26ab9e&osUser=ubuntu&sshPort=22#/  
Hit:2 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease  
Hit:3 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease  
Hit:4 http://security.ubuntu.com/ubuntu noble-security InRelease  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
25 packages can be upgraded. Run 'apt list --upgradable' to see them.  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
apache2 is already the newest version (2.4.58-1ubuntu8.4).  
0 upgraded, 0 newly installed, 0 to remove and 25 not upgraded.  
root@ip-20-0-3-92:/var/www/html# cat index.html  
this is a california server  
root@ip-20-0-3-92:/var/www/html# systemctl status apache2  
● apache2.service - The Apache HTTP Server  
   Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)  
   Active: active (running) since Tue 2024-08-13 05:54:59 UTC; 5h 38min ago  
     Docs: https://httpd.apache.org/docs/2.4/  
   Main PID: 3285 (apache2)  
     Tasks: 55 (limit: 1130)  
  Memory: 8.4M (peak: 8.6M)  
     CPU: 1.097s  
   CGroup: /system.slice/apache2.service  
           └─3285 /usr/sbin/apache2 -k start  
           └─3288 /usr/sbin/apache2 -k start  
           └─3289 /usr/sbin/apache2 -k start  
Aug 13 05:54:59 ip-20-0-3-92 systemd[1]: Starting apache2.service - The Apache HTTP Server...  
Aug 13 05:54:59 ip-20-0-3-92 systemd[1]: Started apache2.service - The Apache HTTP Server.  
root@ip-20-0-3-92:/var/www/html# curl 3.147.62.83:80  
this is a ohio server  
root@ip-20-0-3-92:/var/www/html# curl 44.243.17.227:80  
this is a oregon server  
root@ip-20-0-3-92:/var/www/html# curl 20.0.3.92:80  
this is a california server  
root@ip-20-0-3-92:/var/www/html#
```

```
tgw-attach-0d2597479255f62c | Instance details | EC2 | us-west-1 | EC2 Instance Connect | us-west-1 | EC2 Instance Connect | us-west-1 | New Tab  
us-west-2.console.aws.amazon.com/ec2-instance-connect/ssh?region=us-west-2&connType=standard&instanceId=i-02e4221632750a7198&osUser=ec2-user&sshPort=22#/  
Amazon Linux 2023  
https://aws.amazon.com/linux/amazon-linux-2023  
Last login: Tue Aug 13 14:21:40 2024 from 18.237.140.164  
[ec2-user@ip-30-0-9-92 ~]$ sudo -i  
[root@ip-30-0-9-92 ~]# yum update -y && yum install nginx -y && cd /usr/share/nginx/html  
Last metadata expiration check: 9:33:54 ago on Tue Aug 13 04:55:21 2024.  
Dependencies resolved.  
Nothing to do.  
Complete!  
Last metadata expiration check: 9:33:55 ago on Tue Aug 13 04:55:21 2024.  
Package nginx-1:1.24.0-1.amzn2023.0.2.x86_64 is already installed.  
Dependencies resolved.  
Nothing to do.  
Complete!  
[root@ip-30-0-9-92 html]# cat index.html  
this is a oregon server  
[root@ip-30-0-9-92 html]# systemctl status nginx  
● nginx.service - The nginx HTTP and reverse proxy server
```



Browser tabs: tgw-attach-0d2597479255f62c | Instance details | EC2 | us-west-2 | EC2 Instance Connect | us-west-2 | EC2 Instance Connect | us-west-2 | New Tab

Address bar: us-west-2.console.aws.amazon.com/ec2-instance-connect/ssh?region=us-west-2&connType=standard&instanceId=i-02e4221632750a719&osUser=ec2-user&sshPort=22#/?

Services Search [Alt+S] Oregon Y. Swathi

```
Loaded: loaded (/usr/lib/systemd/system/nginx.service; disabled; preset: disabled)
Active: active (running) since Tue 2024-08-13 14:22:39 UTC; 6min ago
Process: 42784 ExecStartPre=/usr/bin/rm -f /run/nginx.pid (code=exited, status=0/SUCCESS)
Process: 42786 ExecStartPre=/usr/sbin/nginx -t (code=exited, status=0/SUCCESS)
Process: 42787 ExecStart=/usr/sbin/nginx (code=exited, status=0/SUCCESS)
Main PID: 42788 (nginx)
Tasks: 2 (limit: 1112)
Memory: 2.2M
CPU: 54ms
CGroup: /system.slice/nginx.service
└─42788 "nginx: master process /usr/sbin/nginx"
   └─42789 "nginx: worker process"
```

Aug 13 14:22:39 ip-30-0-9-92.us-west-2.compute.internal systemd[1]: Starting nginx.service - The nginx HTTP and reverse proxy server...

Aug 13 14:22:39 ip-30-0-9-92.us-west-2.compute.internal nginx[42786]: nginx: the configuration file /etc/nginx/nginx.conf syntax is ok

Aug 13 14:22:39 ip-30-0-9-92.us-west-2.compute.internal nginx[42786]: nginx: configuration file /etc/nginx/nginx.conf test is successful

Aug 13 14:22:39 ip-30-0-9-92.us-west-2.compute.internal systemd[1]: Started nginx.service - The nginx HTTP and reverse proxy server.

[root@ip-30-0-9-92 html]# curl 54.153.64.229:80  
this is a california server

[root@ip-30-0-9-92 html]# curl 3.147.62.83:80  
this is a ohio server

[root@ip-30-0-9-92 html]# curl 44.243.17.227:80

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