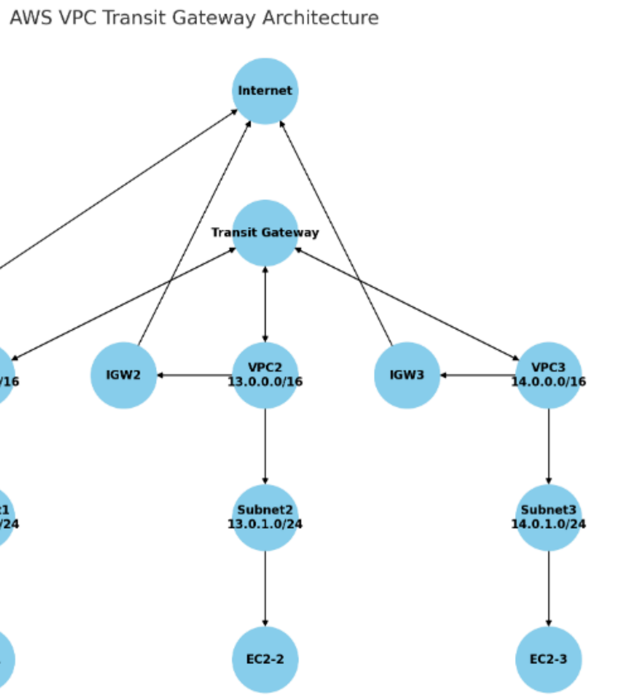
AWS VPC Transit Gateway

Create VPCs



Architecture

The following diagram shows a transit gateway with three VPC attachments. The route table for each of these VPCs includes the routes that send traffic destined for the other two VPCs to the transit gateway.

1. VPC Dashboard:

- Go to the AWS Management Console.
- Search for VPC and select "VPC".

Create VPC-1:

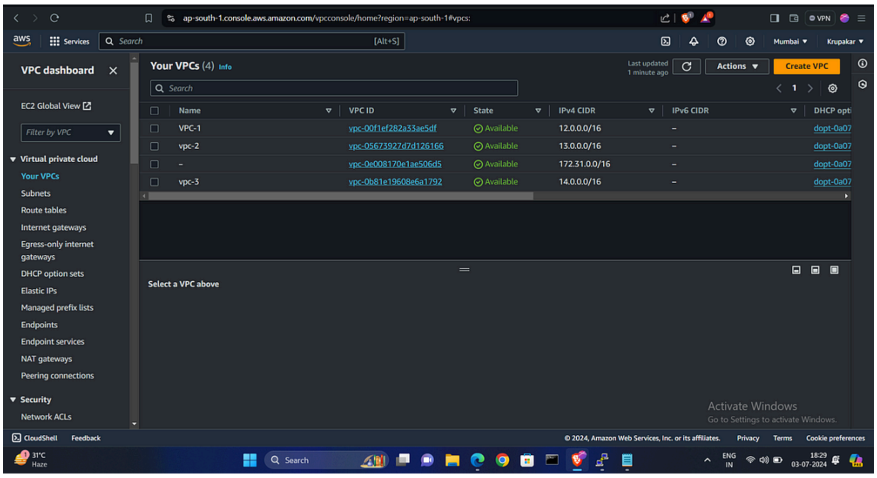
- Click on "Create VPC".
- Name: `VPC-1`
- IPv4 CIDR block: `12.0.0.0/16`
- Click "Create VPC".

Create VPC-2:

- Click on “Create VPC”.
- Name: `VPC-2`
- IPv4 CIDR block: `13.0.0.0/16`
- Click “Create VPC”.

Create VPC-3:

- Click on “Create VPC”.
- Name: `VPC-3`
- IPv4 CIDR block: `14.0.0.0/16`
- Click On “Create VPC”.



Your VPCs (4) Info

Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR	DHCP opti
VPC-1	vpc-00f1ef282a33ae5df	Available	12.0.0.0/16	–	dopt-0a07
vpc-2	vpc-05673927d7d126166	Available	13.0.0.0/16	–	dopt-0a07
–	vpc-0e008170e1ae506d5	Available	172.31.0.0/16	–	dopt-0a07
vpc-3	vpc-0b81e19608e6a1792	Available	14.0.0.0/16	–	dopt-0a07

list of created VPCs

2. Create Internet Gateway:

Create and Attach Internet Gateways

Click on “Internet Gateways” in the left-hand menu.

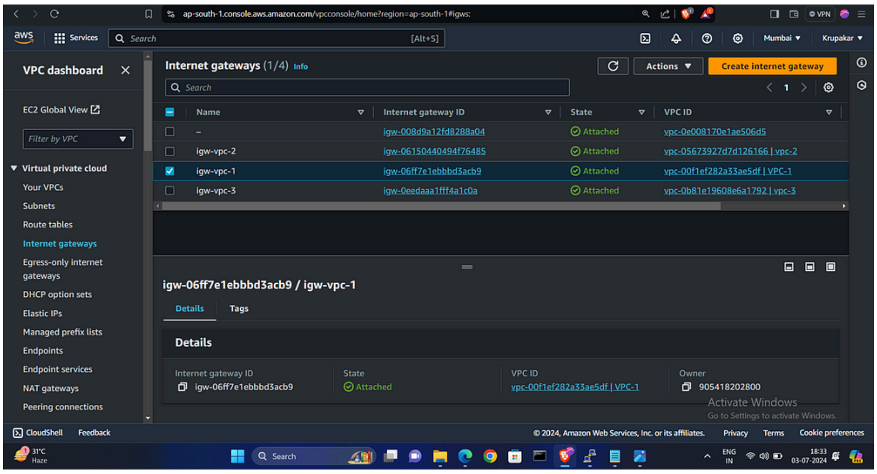
- Click on “Internet Gateways” in the left-hand menu.
- Click on“Create internet gateway”.
- Name: `IGW-1`
- Click on“Create internet gateway”.

Attach Internet Gateway to VPC-1:

- Select `IGW-1` .
- Click on “Actions” and select “Attach to VPC”.
- Select `VPC-1` and click "Attach".

Repeat for VPC-2 and VPC-3:

- Create and attach `IGW-2` to `VPC-2` .
- Create and attach `IGW-3` to `VPC-3` .



Internet gateways (1/4)

Name	Internet gateway ID	State	VPC ID
–	igw-008d9a12fd8288a04	Attached	vpc-0e008170e1ae506d5
igw-vpc-2	igw-06150440494f76485	Attached	vpc-05673927d7d126166 | vpc-2
igw-vpc-1	igw-06ff7e1ebbbd3acb9	Attached	vpc-00f1ef282a33ae5df | VPC-1
igw-vpc-3	igw-0eedaaa1fff4a1c0a	Attached	vpc-0b81e19608e6a1792 | vpc-3

igw-06ff7e1ebbbd3acb9 / igw-vpc-1

Details

Internet gateway ID	State	VPC ID	Owner
igw-06ff7e1ebbbd3acb9	Attached	vpc-00f1ef282a33ae5df | VPC-1	905418202800

Internet Gateways attached to VPCs

3. Create Subnets

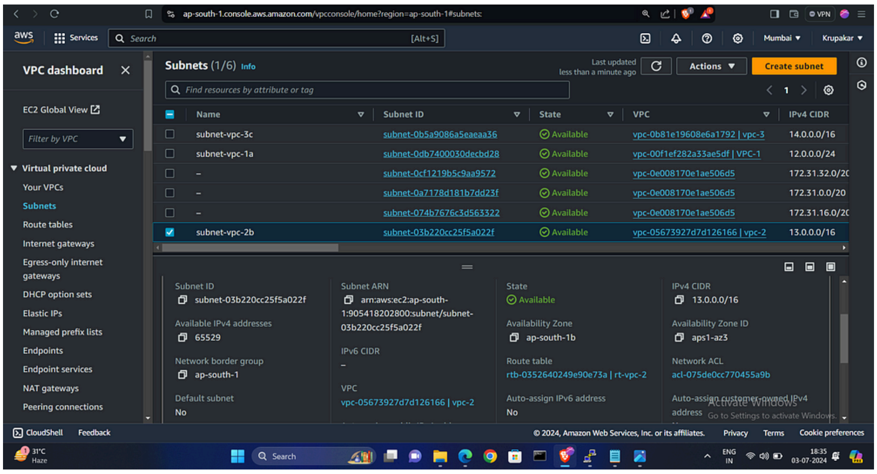
Create Subnet in VPC-1:

- Click on “Subnets” in the left-hand menu.
- Click “Create subnet”.
- Name: `Subnet-1`
- VPC: `VPC-1`
- IPv4 CIDR block: `12.0.1.0/24`
- Click on “Create subnet”.

Repeat for VPC-2 and VPC-3:

- Create `Subnet-2` in `VPC-2` with CIDR `13.0.1.0/24` .

- Create `Subnet-3` in `VPC-3` with CIDR `14.0.1.0/24` .



Subnets (1/6) Info

	Name	Subnet ID	State	VPC	IPv4 CIDR
□	subnet-vpc-3c	subnet-0b5a9086a5eaeaa36	Available	vpc-0b81e19608e6a1792 | vpc-3	14.0.0.0/16
□	subnet-vpc-1a	subnet-0db7400030decbd28	Available	vpc-00f1ef282a33ae5df | VPC-1	12.0.0.0/24
□	–	subnet-0cf1219b5c9aa9572	Available	vpc-0e008170e1ae506d5	172.31.32.0/2
□	–	subnet-0a7178d181b7dd23f	Available	vpc-0e008170e1ae506d5	172.31.0.0/20
□	–	subnet-074b7676c3d563322	Available	vpc-0e008170e1ae506d5	172.31.16.0/2
☑	subnet-vpc-2b	subnet-03b220cc25f5a022f	Available	vpc-05673927d7d126166 | vpc-2	13.0.0.0/16

Subnet ID: subnet-03b220cc25f5a022f

Available IPv4 addresses: 65529

Network border group: ap-south-1

Default subnet: No

Subnet ARN: arn:aws:ec2:ap-south-1:905418202800:subnet/subnet-03b220cc25f5a022f

IPv6 CIDR: –

VPC: vpc-05673927d7d126166 | vpc-2

State: Available

Availability Zone: ap-south-1b

Route table: rtb-0352640249e90e73a | rt-vpc-2

Auto-assign IPv6 address: No

IPv4 CIDR: 13.0.0.0/16

Availability Zone ID: aps1-az3

Network ACL: acl-075de0cc770455a9b

Auto-assign customer-owned IPv4 address

list of subnets associated with their respective VPCs

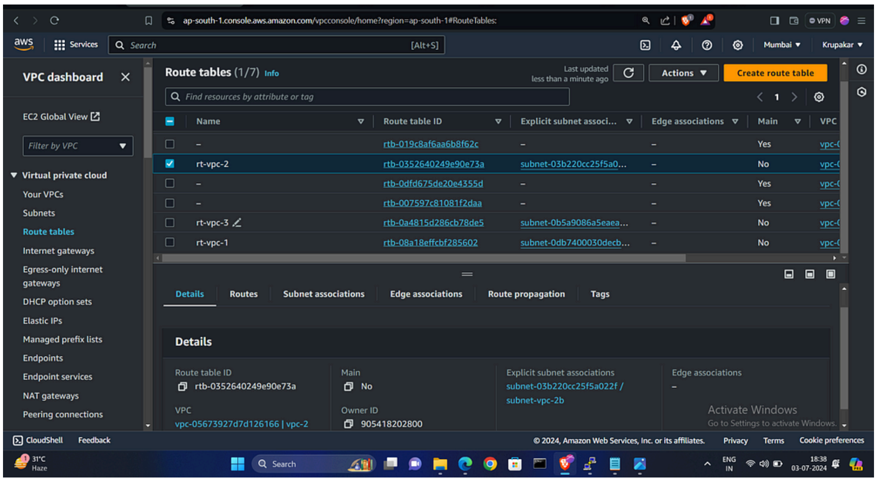
4. Create Route Table for VPC-1:

Create Route Tables and Edit Routes

- Click on “Route Tables” in the left-hand menu.
- Click “Create route table”.
- Name: `RouteTable-1`
- VPC: `VPC-1`
- Click on “Create route table”.

Edit Route Table for VPC-1:

- Select `RouteTable-1` .
- Click on “Routes” tab and then “Edit routes”.
- Add Route: Destination: `0.0.0.0/0` , Target: `IGW-1` .
- Add Route: Destination: `13.0.0.0/16` , Target: `Transit Gateway` .
- Add Route: Destination: `14.0.0.0/16` , Target: `Transit Gateway` .
- Click on “Save routes”.



ap-south-1.console.aws.amazon.com/vpcconsole/home?region=ap-south-1#RouteTables:

Route tables (1/7)

Name	Route table ID	Explicit subnet associ...	Edge associations	Main	VPC
–	rtb-019c8af6aa6b8f62c	–	–	Yes	vpc-(
rt-vpc-2	rtb-0352640249e90e73a	subnet-03b220cc25f5a0...	–	No	vpc-(
–	rtb-0dfd675de20e4355d	–	–	Yes	vpc-(
–	rtb-007597c81081f2daa	–	–	Yes	vpc-(
rt-vpc-3	rtb-0a4815d286cb78de5	subnet-0b5a9086a5eaea...	–	No	vpc-(
rt-vpc-1	rtb-08a18effcbf285602	subnet-0db7400030decb...	–	No	vpc-(

Details

Route table ID: rtb-0352640249e90e73a

Main: No

Explicit subnet associations: subnet-03b220cc25f5a022f / subnet-vpc-2b

Edge associations: –

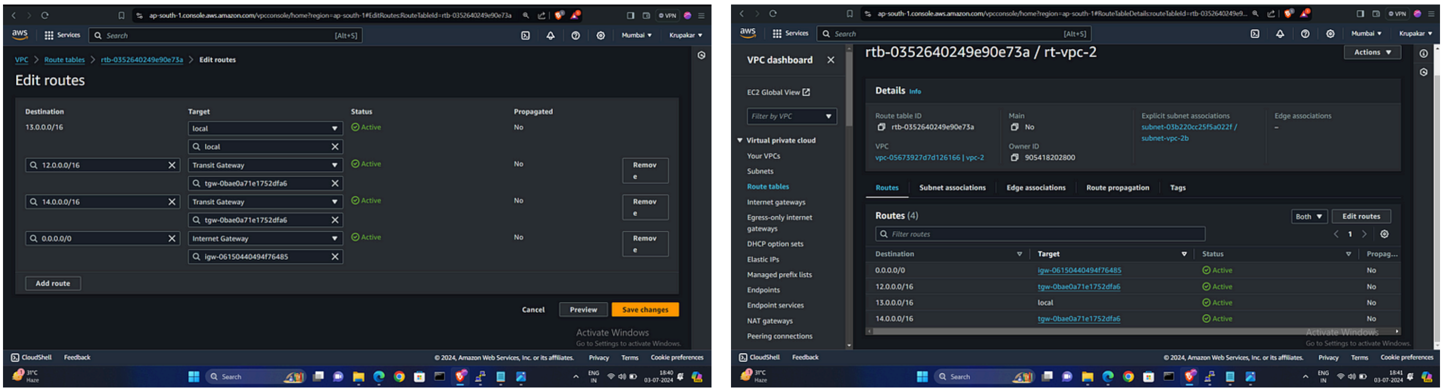
VPC: vpc-05673927d7d126166 | vpc-2

Owner ID: 905418202800

Route tables

Repeat for VPC-2 and VPC-3:

- Create `RouteTable-2` for `VPC-2` and `RouteTable3-` for `VPC-3` .
- Edit `RouteTable-2` : Add routes to `12.0.0.0/16` and `14.0.0.0/16` through Transit Gateway.
- Edit `RouteTable3` : Add routes to `12.0.0.0/16` and `13.0.0.0/16` through Transit Gateway.



ap-south-1.console.aws.amazon.com/vpcconsole/home?region=ap-south-1#EditRoutes:RouteTableId=rtb-0352640249e90e73a

VPC > Route tables > rtb-0352640249e90e73a > Edit routes

Edit routes

Destination	Target	Status	Propagated
13.0.0.0/16	local local	Active	No
12.0.0.0/16	Transit Gateway tgw-0bae0a71e1752dfa6	Active	No
14.0.0.0/16	Transit Gateway tgw-0bae0a71e1752dfa6	Active	No
0.0.0.0/0	Internet Gateway igw-06150440494f76485	Active	No

rtb-0352640249e90e73a / rt-vpc-2

Details

Route table ID: rtb-0352640249e90e73a

Main: No

Explicit subnet associations: subnet-03b220cc25f5a022f / subnet-vpc-2b

Edge associations: –

VPC: vpc-05673927d7d126166 | vpc-2

Owner ID: 905418202800

Routes (4)

Destination	Target	Status	Propag...
0.0.0.0/0	igw-06150440494f76485	Active	No
12.0.0.0/16	tgw-0bae0a71e1752dfa6	Active	No
13.0.0.0/16	local	Active	No
14.0.0.0/16	tgw-0bae0a71e1752dfa6	Active	No

Routes

5. Create Transit Gateway and Attachments

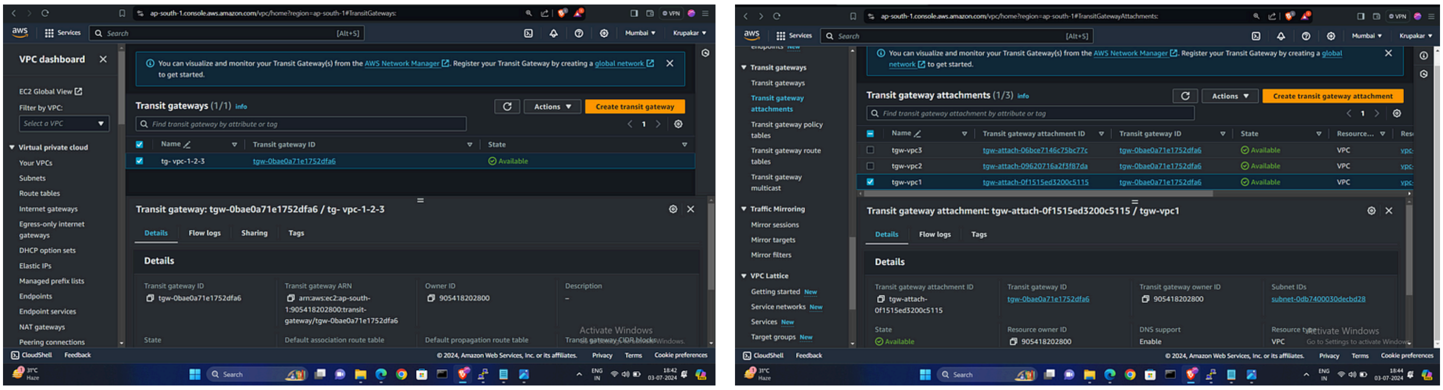
Create Transit Gateway:

- Click on “Transit Gateways” in the left-hand menu.
- Click “Create transit gateway”.
- Name: `TGW-1`

- Click on “Create transit gateway”.

Create Transit Gateway Attachments:

- Select `TGW-1`.
- Click on “Attachments” tab.
- Click on “Create attachment”.
- Attachment type: `VPC`
- Create attachments for each of `VPC1`, `VPC2`, and `VPC3`.
- Click on “Create attachment”.



ap-south-1.console.aws.amazon.com/vpc/home?region=ap-south-1#TransitGateways:

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 (1/1)

☑	Name	Transit gateway ID	State
☑	tg- vpc-1-2-3	tgw-0bae0a71e1752dfa6	Available

Transit gateway: tgw-0bae0a71e1752dfa6 / tg- vpc-1-2-3

Details

Transit gateway ID: tgw-0bae0a71e1752dfa6
Transit gateway ARN: arn:aws:ec2:ap-south-1:905418202800:transit-gateway/tgw-0bae0a71e1752dfa6
Owner ID: 905418202800
Description: –

ap-south-1.console.aws.amazon.com/vpc/home?region=ap-south-1#TransitGatewayAttachments:

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 (1/3)

☐	Name	Transit gateway attachment ID	Transit gateway ID	State	Resource...
☐	tgw-vpc3	tgw-attach-06bce7146c75bc77c	tgw-0bae0a71e1752dfa6	Available	VPC
☐	tgw-vpc2	tgw-attach-09620716a2f3f87da	tgw-0bae0a71e1752dfa6	Available	VPC
☑	tgw-vpc1	tgw-attach-0f1515ed3200c5115	tgw-0bae0a71e1752dfa6	Available	VPC

Transit gateway attachment: tgw-attach-0f1515ed3200c5115 / tgw-vpc1

Details

Transit gateway attachment ID: tgw-attach-0f1515ed3200c5115
Transit gateway ID: tgw-0bae0a71e1752dfa6
Transit gateway owner ID: 905418202800
Subnet IDs: subnet-0db7400030decbd28
State: Available
Resource owner ID: 905418202800
DNS support: Enable
Resource type: VPC

Transit Gateway and Transit Gateway Attachments

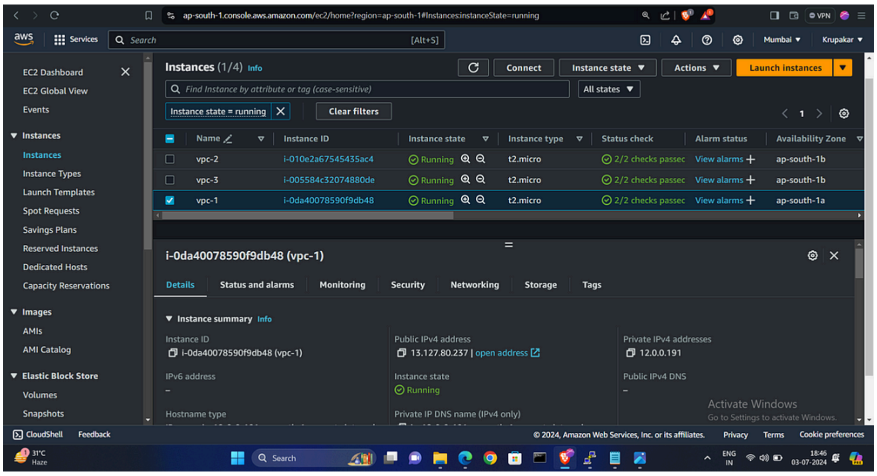
6. Launch EC2 Instances

Launch EC2 Instance in VPC-1:

- Go to the EC2 dashboard.
- Click on “Launch instance”.
- Name: `Instance(Vpc-1)`
- AMI: Amazon Linux 2
- Instance type: t2.micro
- Network: `VPC-1`
- Subnet: `Subnet-1`
- Click on “Launch”.

Repeat for VPC-2 and VPC-3:

- Launch `Instance(vpc-2)` in `VPC2` and `Subnet-2` .
- Launch `Instance(Vpc-3)` in `VPC-3` and `Subnet-3` .



Instances (1/4) Info

Instance state = running

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
vpc-2	i-010e2a67545435ac4	Running	t2.micro	2/2 checks passec	View alarms	ap-south-1b
vpc-3	i-005584c32074880de	Running	t2.micro	2/2 checks passec	View alarms	ap-south-1b
vpc-1	i-0da40078590f9db48	Running	t2.micro	2/2 checks passec	View alarms	ap-south-1a

i-0da40078590f9db48 (vpc-1)

Instance summary Info

Instance ID: i-0da40078590f9db48 (vpc-1)

Public IPv4 address: 13.127.80.237 | open address

Private IPv4 addresses: 12.0.0.191

IPv6 address: –

Instance state: Running

Public IPv4 DNS: –

Hostname type

Private IP DNS name (IPv4 only)

launched EC2 instances.

SSH into EC2 Instance in VPC-1:

Use an SSH client to connect to `Instance(Vpc-1)`

```
ssh -i your-key.pem ec2-user@<public-ip-of-insta
```

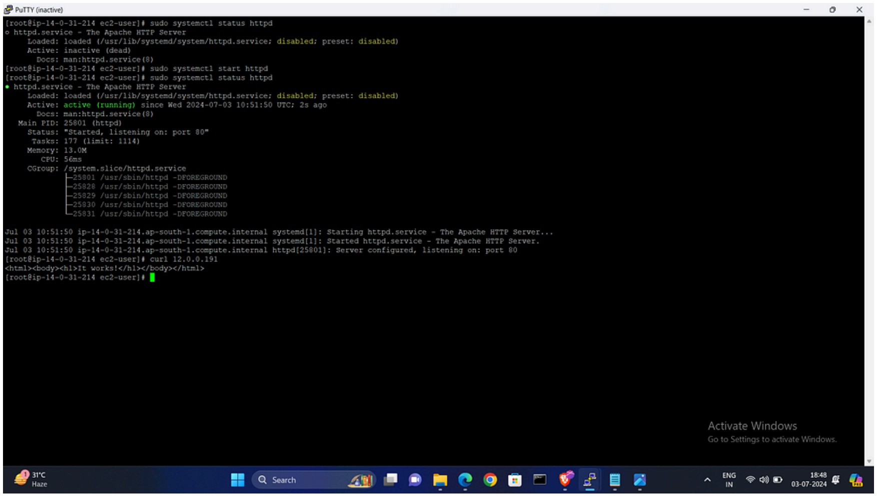
Install `httpd` :

Install HTTP Server (`httpd)`

```
sudo yum update -y
sudo yum install -y httpd
sudo systemctl start httpd
sudo systemctl enable httpd
```

1. **Repeat for Instances in VPC-2 and VPC-3:**

- SSH into `Instance(Vpc-2)` and `Instance(vpc-3)` and install `httpd`.



```
[root@ip-14-0-31-214 ec2-user]# sudo systemctl status httpd
○ httpd.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; preset: disabled)
     Active: inactive (dead)
       Docs: man:httpd.service(8)
[root@ip-14-0-31-214 ec2-user]# sudo systemctl start httpd
[root@ip-14-0-31-214 ec2-user]# sudo systemctl status httpd
● httpd.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; preset: disabled)
     Active: active (running) since Wed 2024-07-03 10:51:50 UTC; 2s ago
       Docs: man:httpd.service(8)
   Main PID: 25801 (httpd)
     Status: "Started, listening on: port 80"
      Tasks: 177 (limit: 1114)
     Memory: 13.0M
        CPU: 56ms
     CGroup: /system.slice/httpd.service
             ├─25801 /usr/sbin/httpd -DFOREGROUND
             ├─25828 /usr/sbin/httpd -DFOREGROUND
             ├─25829 /usr/sbin/httpd -DFOREGROUND
             ├─25830 /usr/sbin/httpd -DFOREGROUND
             └─25831 /usr/sbin/httpd -DFOREGROUND

Jul 03 10:51:50 ip-14-0-31-214.ap-south-1.compute.internal systemd[1]: Starting httpd.service - The Apache HTTP Server...
Jul 03 10:51:50 ip-14-0-31-214.ap-south-1.compute.internal systemd[1]: Started httpd.service - The Apache HTTP Server.
Jul 03 10:51:50 ip-14-0-31-214.ap-south-1.compute.internal httpd[25801]: Server configured, listening on: port 80
[root@ip-14-0-31-214 ec2-user]# curl 12.0.0.191
<html><body><h1>It works!</h1></body></html>
[root@ip-14-0-31-214 ec2-user]#
```

terminal with httpd installation and systemctl status.

8. Verify Connectivity

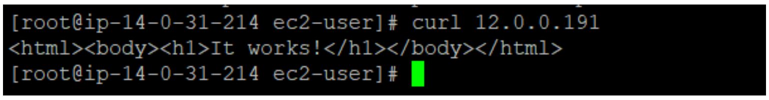
SSH into EC2 Instance in VPC-1:

- Connect to `Instance(Vpc-1)` using SSH.

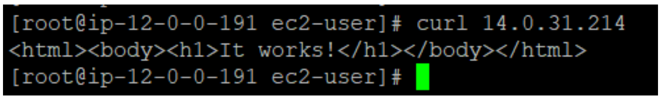
1. **Use `curl` to Check Connectivity:**

- Run the following commands

```bash
curl http://<private-ip-of-instance2>
curl http://<private-ip-of-instance3>
```



```
[root@ip-14-0-31-214 ec2-user]# curl 12.0.0.191
<html><body><h1>It works!</h1></body></html>
[root@ip-14-0-31-214 ec2-user]#
```



```
[root@ip-12-0-0-191 ec2-user]# curl 14.0.31.214
<html><body><h1>It works!</h1></body></html>
[root@ip-12-0-0-191 ec2-user]#
```