

1) I am creating custom VPC With Public and Private Subnet.

Steps:

1) Created custom VPC with ip : 10.0.0.0/16

Details			
VPC ID <a href="#">vpc-0ea9769b465d10401</a>	State <span>Available</span>	DNS hostnames Disabled	DNS resolution Enabled
Tenancy Default	DHCP option set <a href="#">dopt-0c5b2ec9c38388b70</a>	Main route table <a href="#">rtb-04ed91682ebde59ac</a>	Main network ACL <a href="#">acl-011df53fc86ad8fa2</a>
Default VPC No	IPv4 CIDR 10.0.0.0/16	IPv6 pool -	IPv6 CIDR (Network border group) -
Network Address Usage metrics Disabled	Route 53 Resolver DNS Firewall rule groups -	Owner ID <a href="#">039612874025</a>	

2) Create internet gateway : igfor-test

Details							
Internet gateway ID <a href="#">igw-0d31c70cd94b4f9d3</a>	State <span>Attached</span>	VPC ID <a href="#">vpc-0ea9769b465d10401</a>	Owner <a href="#">039612874025</a>				
Tags							
<input type="text"/> Search tags			<a href="#">Manage tags</a>				
<table><thead><tr><th>Key</th><th>Value</th></tr></thead><tbody><tr><td>Name</td><td>igfor-test</td></tr></tbody></table>			Key	Value	Name	igfor-test	<a href="#">&lt;</a> <a href="#">1</a> <a href="#">&gt;</a> <a href="#">⚙️</a>
Key	Value						
Name	igfor-test						

3) Attached it to VPC by visiting actions tab.

4) Creating Public and Private Subnet: Created subnet public and private.

Subnets (5) <a href="#">Info</a>					Last updated less than a minute ago	<a href="#">Actions ▾</a>	<a href="#">Create subnet</a>
<input type="text"/> Find resources by attribute or tag							
<input type="checkbox"/>	Name	Subnet ID	State	VPC			
<input type="checkbox"/>	pub-sub-test	<a href="#">subnet-0eabb6276d331f28b</a>	<span>Available</span>	<a href="#">vpc-0ea9769b465d10401   vpcf...</a>			
<input type="checkbox"/>	-	<a href="#">subnet-0da439f5e3585f226</a>	<span>Available</span>	<a href="#">vpc-0f477050281e279da</a>			
<input type="checkbox"/>	private-sub-test	<a href="#">subnet-0229a18576bf9ea29</a>	<span>Available</span>	<a href="#">vpc-0ea9769b465d10401   vpcf...</a>			
<input type="checkbox"/>	-	<a href="#">subnet-0ca77c1ad6ha4fh07</a>	<span>Available</span>	<a href="#">vpc-0f477050281e279da</a>			

Select a subnet

## 5)Creation of NAT Gateway To access internet on private instance.

nat-04496f984c790935b / nat-gtw				<a href="#">Actions ▾</a>
Details				
NAT gateway ID <a href="#">nat-04496f984c790935b</a>	Connectivity type Public	State <span>Pending</span>	State message <a href="#">Info</a>	-
NAT gateway ARN <a href="#">arn:aws:ec2:ap-south-1:039612874025:natgateway/nat-04496f984c790935b</a>	Primary public IPv4 address -	Primary private IPv4 address -	Primary network interface ID	-
VPC <a href="#">vpc-0ea9769b465d10401 / vpcfotest</a>	Subnet <a href="#">subnet-0eabb6276d331f28b / pub-sub-test</a>	Created <a href="#">Monday, September 9, 2024 at 16:28:44 GMT+5:30</a>	Deleted	-

## 6)Edit routes into particular route tables:

### Public

<span>Success</span> Route table rtb-0f2438784e539421f   public-rt was created successfully.	<span>X</span>		
rtb-0f2438784e539421f / public-rt		<a href="#">Actions ▾</a>	
Details <a href="#">Info</a>			
Route table ID <a href="#">rtb-0f2438784e539421f</a>	Main <span>No</span>	Explicit subnet associations -	Edge associations -
VPC <a href="#">vpc-0ea9769b465d10401   vpcfotest</a>	Owner ID <a href="#">039612874025</a>		
<a href="#">Routes</a>		<a href="#">Subnet associations</a>	<a href="#">Edge associations</a>
<a href="#">Route propagation</a>		<a href="#">Tags</a>	

Private :

The screenshot shows the AWS VPC Route Tables page. A specific route table, 'rtb-0034dbc2a59a0ec89 / private-rt', is selected. The 'Details' tab is active, displaying information such as Route table ID, Main status (No), and VPC details. Below the details, tabs for Routes, Subnet associations, Edge associations, Route propagation, and Tags are present. Under the Routes tab, one route is listed: 'Routes (1)'. The route table is associated with a single subnet.

Subnet association completed.

The screenshot shows the 'Edit subnet associations' page for the route table 'rtb-0034dbc2a59a0ec89'. It lists available subnets and selected subnets. The 'private-sub-test' subnet is selected and associated with the route table. Buttons for 'Cancel' and 'Save associations' are at the bottom.

7) Added internet gateway to access internet at public server.

To be needed to host website.

The screenshot shows the 'Edit routes' page for the route table 'rtb-0f2438784e539421f'. It lists existing routes and allows adding new ones. A new route is being added with a destination of '0.0.0.0/0', a target of 'Internet Gateway', and a specific gateway ID 'igw-0d31c70cd94b4f9d3'. The status is 'Active' and propagation is set to 'No'. A 'Save changes' button is at the bottom.

In private route added nat gateway.

search [Alt+S] Mumbai ▾ R

Updated routes for rtb-0034dbc2a59a0ec89 / private-rt successfully

► Details

Route table ID rtb-0034dbc2a59a0ec89	Main No	Explicit subnet associations subnet-0229a18576bf9ea29 / private-sub-test	Edge associations -
VPC vpc-0ea9769b465d10401   vpcfortest	Owner ID 039612874025		

**Routes** Subnet associations Edge associations Route propagation Tags

**Routes (2)**

Filter routes Both ▾ Edit routes < 1 > ⚙

Destination	Target	Status	Propagated
0.0.0.0/0	nat-04496f984c790935b	Active	No
10.0.0.0/16	local	Active	No

## Created public instance

vpc-key Create new key pair

▼ Network settings Info

VPC - required Info

vpc-0ea9769b465d10401 (vpcfortest) 10.0.0.0/16

Subnet Info

subnet-0eabb6276d331f28b pub-sub-test  
 VPC: vpc-0ea9769b465d10401 Owner: 039612874025  
 Availability Zone: ap-south-1a Zone type: Availability Zone  
 IP addresses available: 250 CIDR: 10.0.0.0/24

Create new subnet

Auto-assign public IP Info

Enable Additional charges apply when outside of free tier allowance

Firewall (security groups) Info

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach

▼ Summary

Number of instances Info

1

Software Image (AMI)

Amazon Linux 2023 AMI 2023.5.2...read more ami-0e53db6fd757e38c7

Virtual server type (instance type)

t2.micro

Firewall (security group)

New security group

Storage (optional)

Cancel Launch instance Previous commands

## Created private instance

VPC - required | [Info](#)

vpc-0ea9769b465d10401 (vpcfortest)  
10.0.0.0/16

Subnet | [Info](#)

subnet-0229a18576bf9ea29 private-sub-test  
VPC: vpc-0ea9769b465d10401 Owner: 039612874025  
Availability Zone: ap-south-1c Zone type: Availability Zone  
IP addresses available: 251 CIDR: 10.0.1.0/24

Create new subnet [\[x\]](#)

Auto-assign public IP | [Info](#)

Disable

Firewall (security groups) | [Info](#)

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

Create security group  Select existing security group

Common security groups [Info](#)

Select security groups

### 8)Connected to public server :

```
root@ip-10-0-0-110:~ x + v
Microsoft Windows [Version 10.0.22631.4037]
(c) Microsoft Corporation. All rights reserved.

C:\Users\10748011>cd downloads

C:\Users\10748011\Downloads>ssh -i "vpc-key.pem" ec2-user@15.206.123.105
The authenticity of host '15.206.123.105 (15.206.123.105)' can't be established.
ED25519 key fingerprint is SHA256:91S9ssw8GP1aIU9LNqv98DjKbVQIdtHVsZaNFgQooW8.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '15.206.123.105' (ED25519) to the list of known hosts.

  _#
  ~\_ #####      Amazon Linux 2023
  ~~ \_#####\
  ~~   \###|
  ~~     \#/ ___ https://aws.amazon.com/linux/amazon-linux-2023
  ~~   V~' '-->
  ~~     /
  ~~   .-' _/
  ~~   /_/
  ~~   /m'/[ec2-user@ip-10-0-0-110 ~]$ sudo su -
[root@ip-10-0-0-110 ~]# |
```

Installed httpd for hosting website on public server.

```

Verifying : httpd-core-2.4.62-1.amzn2023.x86_64
Verifying : httpd-filesystem-2.4.62-1.amzn2023.noarch
Verifying : httpd-tools-2.4.62-1.amzn2023.x86_64
Verifying : libbrotli-1.0.9-4.amzn2023.0.2.x86_64
Verifying : mailcap-2.1.49-3.amzn2023.0.3.noarch
Verifying : mod_http2-2.0.27-1.amzn2023.0.3.x86_64
Verifying : mod_lua-2.4.62-1.amzn2023.x86_64

1
1
1

Installed:
apr-1.7.2-2.amzn2023.0.2.x86_64
apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64
httpd-2.4.62-1.amzn2023.x86_64
httpd-filesystem-2.4.62-1.amzn2023.noarch
libbrotli-1.0.9-4.amzn2023.0.2.x86_64
mailcap-2.1.49-3.amzn2023.0.3.noarch
mod_http2-2.0.27-1.amzn2023.0.3.x86_64
mod_lua-2.4.62-1.amzn2023.x86_64

apr-util-1.6.3-1.amzn2023.0.1.x86_64
generic-logos-httpd-18.0.0-12.amzn2023.0.3.noarch
httpd-core-2.4.62-1.amzn2023.x86_64
httpd-tools-2.4.62-1.amzn2023.x86_64
mailcap-2.1.49-3.amzn2023.0.3.noarch
mod_lua-2.4.62-1.amzn2023.x86_64

Complete!
[root@ip-10-0-0-110 ~]# |

```

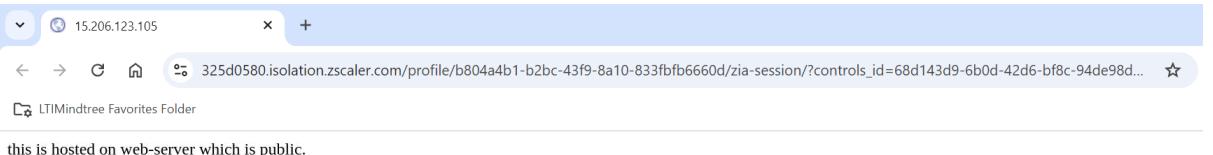
Used following commands to host website:

```

this is hosted on web-server which is public.
[root@ip-10-0-0-110 html]# ls
index.html
[root@ip-10-0-0-110 html]# history
1 yum install httpd
2 systemctl start httpd
3 systemctl enable httpd
4 cd /var/www/html
5 cat
6 cat > index.html
7 ls
8 history
[root@ip-10-0-0-110 html]# |

```

Hosted a website from Public server. Which is running on public ip address.



Here is my private data instance where I am having data on it. Private as it has private ip address.

```
7 ls
8 history
[root@ip-10-0-0-110 html]# cd
[root@ip-10-0-0-110 ~]# vim vpc-key.pem
[root@ip-10-0-0-110 ~]# chmod 400 vpc-key.pem
[root@ip-10-0-0-110 ~]# ssh -i "vpc-key.pem" ec2-user@10.0.1.140
The authenticity of host '10.0.1.140 (10.0.1.140)' can't be established.
ED25519 key fingerprint is SHA256:YQQXjzhPkLIIxgNRpTl2X0a0hus0dStvhSv0Fo7gNQ0.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.0.1.140' (ED25519) to the list of known hosts.

          #_
~\_\_ #####_      Amazon Linux 2023
~~ \_\#####\_
~~ \###|
~~   \#/--- https://aws.amazon.com/linux/amazon-linux-2023
~~   V~' '-->
~~   /
~~--. .--/
~~--/ .--/
~/m/ .--/|_
[ec2-user@ip-10-0-1-140 ~]$ sudo su -
[root@ip-10-0-1-140 ~]# mkdir /data
[root@ip-10-0-1-140 ~]# cd /data
[root@ip-10-0-1-140 data]# touch a.txt
[root@ip-10-0-1-140 data]# ls
a.txt
[root@ip-10-0-1-140 data]# |
```

```
3 touch a.txt
4 ls
5 history
[root@ip-10-0-1-140 data]# cd
[root@ip-10-0-1-140 ~]# history
1 mkdir /data
2 cd /data
3 touch a.txt
4 ls
5 history
6 cd
7 history
[root@ip-10-0-1-140 ~]# |
```

Q2) Creating two custom vpcs in different region Mumbai and Singapore.

Creating For Singapore First.

1)created VPC in Singapore with ip address :30.0.0.0/16

The screenshot shows the AWS VPC console with the region set to Singapore. A success message at the top indicates that an Internet gateway was successfully attached to a VPC. The main table displays three VPC entries:

Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR
vpc-singa	vpc-0c731e4d30e7023a9	Available	20.0.0.0/16	-
vpc-in-singa	vpc-0624f55b238ed2def	Available	30.0.0.0/16	-
-	vpc-00a1742b758b543b0	Available	172.31.0.0/16	-

A message at the bottom says "Select a VPC above".

Created public-test-ig – Internet gateway in Singapore region.

The screenshot shows the AWS Internet Gateways console with the region set to Singapore. It lists three Internet Gateways:

Name	Internet gateway ID	State	VPC ID
public-ig	igw-06f3741ca18463ed1	Attached	vpc-0c731e4d30e7023a9   v...
-	igw-0b4623cf4cc7ffe78	Attached	vpc-00a1742b758b543b0
public-test-ig	igw-0f665c1ff246b2bb5	Attached	vpc-0624f55b238ed2def   v...

Created Public test subnet: which is public subnet required for peering connection.

The screenshot shows the AWS Subnets console with the region set to Singapore. It lists four subnets:

Name	Subnet ID	State	VPC
public-subnet	subnet-0c6aa82c19c19b654	Available	vpc-0c731e4d30e7023a9   vpc-...
public-test-sub	subnet-04d6e8365baa8ea4a	Available	vpc-0624f55b238ed2def   vpc-i...
-	subnet-0edd46f2f03707bd0	Available	vpc-00a1742b758b543b0

A message at the bottom says "Select a subnet".

Created Public route table to enter details of public subnet with it.

The screenshot shows the AWS VPC Route Tables page. A green success message at the top reads: "Route table rtb-0cb3ac21e46724f59 | public-rt-test was created successfully." Below the message, the route table name is displayed: "rtb-0cb3ac21e46724f59 / public-rt-test". The "Actions" dropdown menu is visible. The main content area shows the "Details" tab selected, displaying route table ID, VPC information, and association status. Below the details, tabs for "Routes", "Subnet associations", "Edge associations", "Route propagation", and "Tags" are present.

Added internetgateway to it.

The screenshot shows the AWS VPC Route Tables page. A green success message at the top reads: "Updated routes for rtb-0cb3ac21e46724f59 / public-rt-test successfully". Below the message, the route table details are shown. The "Subnet associations" tab is selected, showing two routes listed under "Routes (2)". The routes are: "0.0.0.0/0" with target "igw-0f665c1ff246b2bb5" and status "Active", and "30.0.0.0/16" with target "local" and status "Active".

Added subnet associations to it.

The screenshot shows the AWS VPC Edit subnet associations page. The title is "Edit subnet associations". It displays a table of available subnets and a list of selected subnets. The "Selected subnets" list contains "subnet-04d6e8365baa8ea4a / public-test-sub". Buttons for "Cancel" and "Save associations" are at the bottom right.

Created Peering connection for another region which is Mumbai.

The screenshot shows the AWS VPC Console interface. At the top, there are tabs for 'vpcs | VPC Console', 'Instances | EC2 | ap-south-1', 'VPC | ap-southeast-1', and 'Instances | EC2 | ap-southeast-1'. The main content area is titled 'Create Peering Connection' for 'vpc-0624f55b238ed2def (vpc-in-singa)'. It displays 'VPC CIDRs for vpc-0624f55b238ed2def (vpc-in-singa)' with one entry: '30.0.0.0/16' status 'Associated'. Below this, a section titled 'Select another VPC to peer with' includes fields for 'Account' (set to 'My account'), 'Region' (set to 'Another Region' and 'Asia Pacific (Mumbai) (ap-south-1)'), and 'VPC ID (Acceptor)' (set to 'vpc-0ea9769b465d10401'). The bottom of the screen shows the AWS navigation bar and system tray.

Accepted peering from Singapore to Mumbai region:

The screenshot shows the 'Peering connections' page with 1/1 item. A modal dialog is open titled 'Accept VPC peering connection request' with the identifier 'Info'. The dialog asks 'Are you sure you want to accept this VPC peering connection request? (pcx-0a763eb11d690dc46)'. It lists details: Requester VPC ('vpc-0624f55b238ed2def'), Acceptor VPC ('vpc-0ea9769b465d10401 / vpcfortest'), Requester CIDRs ('30.0.0.0/16'), Acceptor Region ('Mumbai (ap-south-1)'), Requester owner ID ('039612874025 (This account)'), and Acceptor owner ID ('039612874025 (This account)'). Buttons for 'Cancel' and 'Accept request' are at the bottom. The background shows the peering connection details.

Accepted successfully

The screenshot shows the 'Peering connections' page with 1 item. A green banner at the top states 'Your VPC peering connection (pcx-0a763eb11d690dc46) has been established.' with a link to 'Modify my route tables now'. Below the banner, the table shows the established peering connection: Name '-' (highlighted), Peering connection ID 'pcx-0a763eb11d690dc46', Status 'Provisioning', and Requester VPC 'vpc-0624f55b238ed2def'. The bottom of the screen shows the AWS navigation bar and system tray.

Added peering connection to the route table in both region

Mumbai Region:

✓ Updated routes for rtb-0f2438784e539421f / public-rt successfully

► Details

VPC vpc-0ea9769b465d10401   vpcfotest	No Owner ID 039612874025	subnet-0eabb6276d331f28b / pub-sub-test	-
---	--------------------------------	--	---

Routes    Subnet associations    Edge associations    Route propagation    Tags

**Routes (3)**

Destination	Target	Status	Propagated
0.0.0.0/0	igw-0d31c70cd94b4f9d3	Active	No
10.0.0.0/16	local	Active	No
30.0.0.0/16	pcx-0a763eb11d690dc46	Active	No

Singapore Region:

Route tables (1/4) [Info](#)

Last updated less than a minute ago

Name	Route table ID	Explicit subnet assoc...	Edge associations	More
public-rt-test	rtb-0cb3ac21e46724f59	subnet-04d6e8365baa8e...	-	No
-	rtb-0d92ab4bca3262207	-	-	Yes
-	rtb-01984f18772a7208e	-	-	Yes

**Routes**

Destination	Target	Status	Propagated
0.0.0.0/0	igw-0f665c1ff246b2bb5	Active	No
10.0.0.0/16	pcx-0a763eb11d690dc46	Active	No
30.0.0.0/16	local	Active	No

Launched an instance using custom vpc in Singapore region:

The screenshot shows the AWS EC2 Launch Instances wizard. On the left, there's a sidebar with 'Services' and a search bar. The main area has tabs for 'VPC - required' (selected), 'Info', 'Subnet' (selected), 'Auto-assign public IP' (selected), and 'Firewall (security groups)'. Under 'Subnet', it shows 'subnet-04d6e8365baa8ea4a' from 'public-test-sub'. Under 'Auto-assign public IP', it's set to 'Enable'. Under 'Firewall (security groups)', there are two options: 'Create security group' (selected) and 'Select existing security group'. On the right, the 'Summary' section shows 'Number of instances' (1), 'Software Image (AMI)' (Amazon Linux 2023 AMI 2023.5.2...), 'Virtual server type (instance type)' (t2.micro), and a 'Launch instance' button.

Connected to instance in Mumbai and Singapore

Singapore:

```

root@ip-10-0-0-110:~          root@ip-30-0-0-24:~
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\10748011> cd .\Downloads\
PS C:\Users\10748011\Downloads> ssh -i "cicd-key.pem" ec2-user@18.141.176.201
The authenticity of host '18.141.176.201 (18.141.176.201)' can't be established.
ED25519 key fingerprint is SHA256:arlRHwxB2qAjTQ5Ji3uFzKKmBDu04CJVd8bjX0QSFcA.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '18.141.176.201' (ED25519) to the list of known hosts.

'`#_
~~\_ #####_      Amazon Linux 2023
~~ \_#####\_
~~  \###|_
~~   \#/ ___  https://aws.amazon.com/linux/amazon-linux-2023
~~    V~' '->
~~     /`_
~~    /`_`/
~~   /`_`/
~/`_,`/
[ec2-user@ip-30-0-0-24 ~]$ sudo su -
[root@ip-30-0-0-24 ~]# |

```

Mumbai :

```

logout
[ec2-user@ip-10-0-1-140 ~]$ exit
logout
Connection to 10.0.1.140 closed.
[root@ip-10-0-0-110 ~]# client_loop: send disconnect: Connection res

C:\Users\10748011\Downloads>ssh -i "vpc-key.pem" ec2-user@15.206.123
      _#
      ~\_ #####_          Amazon Linux 2023
      ~~ \_#####\
      ~~   \###|
      ~~     \#/ ___   https://aws.amazon.com/linux/amazon-linux-2023
      ~~       V~' '-->
      ~~~         /
      ~~.-.   _/
      _/_ _/
      _/m/'

last login: Mon Sep  9 11:09:04 2024 from 165.225.120.218
[ec2-user@ip-10-0-0-110 ~]$ sudo su -
last login: Mon Sep  9 11:09:07 UTC 2024 on pts/1
[root@ip-10-0-0-110 ~]# |

```

Created peering and successfully shared data to another region.

```

ssh-rsa AAAAB3NzaC1yc2EAAAQABAAQgQC4C+jgNAiCh04UKxAM95e8eq1bTtew6kevEM0j0CSvJDHtc2taXrdCdArTsQnDHdKF99hSpNppVl+IY+X
KhBX85bommnv+ixyZeZg9rcBzcx9CHqCk2fFI8TtitUpRph0WhoUq/cMVikxguJc0b8uMLCXOpRgq6swK0uZLMfv3I6c8pSGVC7S5vyqyfbNfVZdau/3EcV
1iivwDmwsib8FG0i02tQv1V1MuR+tLKFMK0UcJ99V4aGQTXHw/hbD06X8DdXVLQl0maA+VnJ2f+aKwCMOVVyx4dhzDPHGv3Sx23grZP/G51fvCuRNDXMNT
k/VebqpeN+RG83nZtnkmZIdR3RBkm6R59TpFUwL0WCj3Db1/vNrzzJZweFG7iaBDHLYzUh0ZYjzr8Z2u8xX7nN93pV/ywfjBGWV1IvnlnPnJtUZWXjfawwF5Q
L9v9I/rTPX+uopeyaDiKdssJNs90mNILTH/FE5X5FP2VbRvXEmvahOPxlIuBB34x14lKRec= root@ip-10-0-0-110.ap-south-1.compute.internal
[root@ip-10-0-0-110 .ssh]# vim authorized_keys
[root@ip-10-0-0-110 .ssh]# cd
[root@ip-10-0-0-110 ~]# mkdir /data
[root@ip-10-0-0-110 ~]# cd /data
[root@ip-10-0-0-110 data]# touch a.txt{1..10}
[root@ip-10-0-0-110 data]# ls
a.txt1 a.txt10 a.txt2 a.txt3 a.txt4 a.txt5 a.txt6 a.txt7 a.txt8 a.txt9
[root@ip-10-0-0-110 data]# scp -r /data root@30.0.0.24:/tmp
The authenticity of host '30.0.0.24 (30.0.0.24)' can't be established.
ED25519 key fingerprint is SHA256:arlRHwxB2qAjTQ5Ji3uFzKKmBDu04CJVd8bjX0QSFcA.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '30.0.0.24' (ED25519) to the list of known hosts.
a.txt1                               100%   0    0.0KB/s  00:00
a.txt2                               100%   0    0.0KB/s  00:00
a.txt3                               100%   0    0.0KB/s  00:00
a.txt4                               100%   0    0.0KB/s  00:00
a.txt5                               100%   0    0.0KB/s  00:00
a.txt6                               100%   0    0.0KB/s  00:00
a.txt7                               100%   0    0.0KB/s  00:00
a.txt8                               100%   0    0.0KB/s  00:00
a.txt9                               100%   0    0.0KB/s  00:00
a.txt10                              100%   0    0.0KB/s  00:00
[root@ip-10-0-0-110 data]# cd
[root@ip-10-0-0-110 ~]# |

```

```
[root@ip-30-0-0-24 ~]#
[root@ip-30-0-0-24 ~]# cd .ssh
-bash: cd .ssh: command not found
[root@ip-30-0-0-24 ~]# cd .ssh
[root@ip-30-0-0-24 .ssh]# ls
authorized_keys  id_rsa  id_rsa.pub
[root@ip-30-0-0-24 .ssh]# vim authorized_keys
[root@ip-30-0-0-24 .ssh]# cat id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAQABAAQCrDE5ZSJ26jhf0mWDbI9J270p9dH/HPcA3Al3Px70mFkZ3ckAN0JfFP
ZXnvSEDeVpu7moKcXGn5FUooSMhBfdv5PAWXC6oiKd3AxgKbf4MU5eq/OfRoSyXf01s0K0en04Tb0QAw83yYCE7QrAs750
RJijuySlnyZ+P4zFZ+teTYUDmS3zmcno0vyBOT5o4xZRvx5jClF/l8dp1UJ125EJ5SB/azC3BDke0tbE0J5h4vAivoYR63
ooxMysKQkzNJYbzu94T7VVCK50ltqrD5M+RkPOTdairCKA46FL0pZp9jA8AW6nZOAk/88lk53Z4DUsuU2R53Tq9IOwy/XHO
ml8SEs1tk9EX4Z9kdbTav5UEnjWyVgQALioWTlp+wwTe4av+rBiqH6n7R8L1txMzExws= root@ip-30-0-0-24.ap-s
al
[root@ip-30-0-0-24 .ssh]# cd
[root@ip-30-0-0-24 ~]# ls /tmp
data
systemd-private-b0d9f471449f454caa4e69799e06395f-chronyd.service-P8H1ZR
systemd-private-b0d9f471449f454caa4e69799e06395f-dbus-broker.service-cL6Mtd
systemd-private-b0d9f471449f454caa4e69799e06395f-policy-routes@enX0.service-Vj8qY9
systemd-private-b0d9f471449f454caa4e69799e06395f-systemd-logind.service-d0bZ1r
systemd-private-b0d9f471449f454caa4e69799e06395f-systemd-resolved.service-fowXXW
[root@ip-30-0-0-24 ~]# cd ls /tmp/data
-bash: cd: too many arguments
[root@ip-30-0-0-24 ~]# ls /tmp/data
a.txt1  a.txt10 a.txt2  a.txt3  a.txt4  a.txt5  a.txt6  a.txt7  a.txt8  a.txt9
[root@ip-30-0-0-24 ~]# |
```

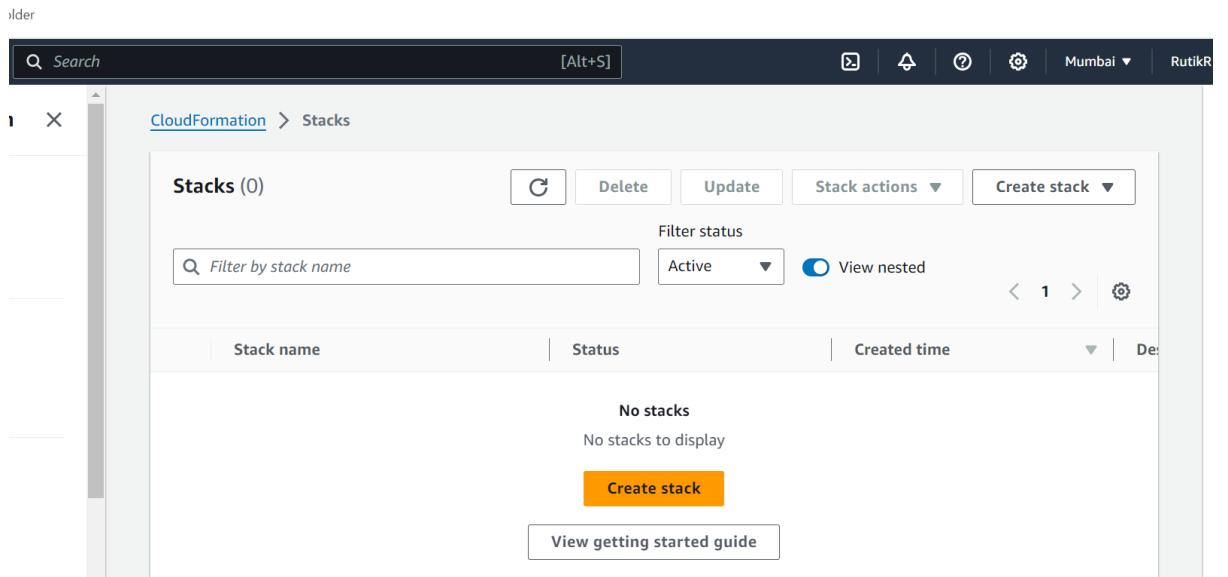
Vice versa for another region which is Mumbai.

```
ED25519 Key fingerprint is SHA256:913338661a107ERqv38DjR0VQ1dchV3Zam-gQ86m5.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.0.0.110' (ED25519) to the list of known hosts.
[root@ip-30-0-0-24 data2]# cd
[root@ip-30-0-0-24 ~]# scp -r /data2 root@10.0.0.110:/mnt
[root@ip-30-0-0-24 ~]# cd /data2
[root@ip-30-0-0-24 data2]# ls
[root@ip-30-0-0-24 data2]# touch b.txt{1..10}
[root@ip-30-0-0-24 data2]# ls
b.txt1  b.txt2  b.txt3  b.txt4  b.txt5  b.txt6  b.txt7  b.txt8  b.txt9
[root@ip-30-0-0-24 data2]# scp -r /data2 root@10.0.0.110:/mnt
b.txt1          100%   0    0.0KB/s  00:00
b.txt2          100%   0    0.0KB/s  00:00
b.txt3          100%   0    0.0KB/s  00:00
b.txt4          100%   0    0.0KB/s  00:00
b.txt5          100%   0    0.0KB/s  00:00
b.txt6          100%   0    0.0KB/s  00:00
b.txt7          100%   0    0.0KB/s  00:00
b.txt8          100%   0    0.0KB/s  00:00
b.txt9          100%   0    0.0KB/s  00:00
b.txt10         100%   0    0.0KB/s  00:00
[root@ip-30-0-0-24 data2]# |
```

Received by Mumbai public server

```
[root@ip-10-0-0-110 mnt]# cd data2
[root@ip-10-0-0-110 data2]# ls
[root@ip-10-0-0-110 data2]# ls
b.txt1  b.txt10 a.txt2  a.txt3  a.txt4  a.txt5  a.txt6  a.txt7  a.txt8  a.txt9
[root@ip-10-0-0-110 data2]# |
```

Q3)Creating instance in Mumbai region with cloud formation. (ap south 1a).



Creating file in notepad to write a script in it.

The screenshot shows a Notepad window with a file named 'ec2.yml'. The content of the file is a CloudFormation template:

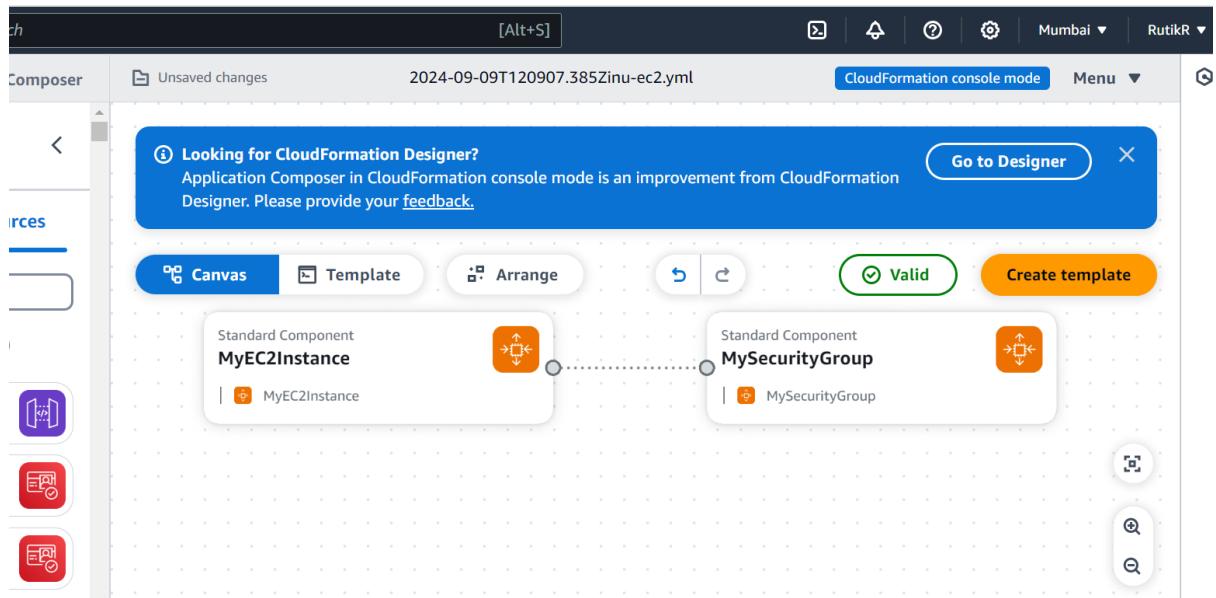
```
AWSTemplateFormatVersion: '2010-09-09'
Description: AWS CloudFormation Template to create an EC2 instance in ap-south-1a

Resources:
  MyEC2Instance:
    Type: 'AWS::EC2::Instance'
    Properties:
      InstanceType: t2.micro
      KeyName: dev
      ImageId: ami-0e53db6fd757e38c7
      AvailabilityZone: ap-south-1a
      SecurityGroups:
        - !Ref MySecurityGroup

  MySecurityGroup:
    Type: 'AWS::EC2::SecurityGroup'
    Properties:
      GroupDescription: Enable SSH access
      SecurityGroupIngress:
        - IpProtocol: tcp
          FromPort: '22'
          ToPort: '22'
```

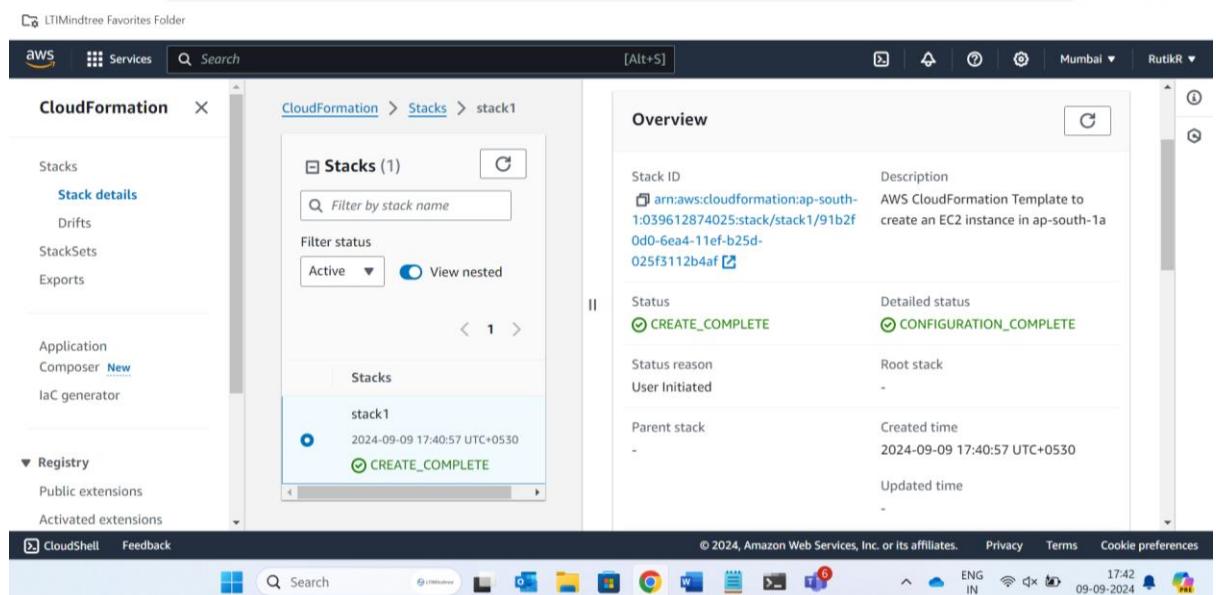
The Notepad window has a toolbar with 'File', 'Edit', and 'View' options. The status bar at the bottom shows 'Ln 9, Col 19' and '617 characters'. On the right side of the screen, there is a vertical sidebar with a list of recent files: '8fbf8c2', '7facd4', '329071', and 'f0845b'.

Validated the script in yml visual editor



It shows valid yaml script.

Now created stack using this ec2.yml script which is given above.



And it shows successfully creation of instance and security group in ec2 dashboard.

Below are the ss of proving above statement.:

An instance has been created in region ap-south-1a, :With instance id : [i-011bb6e761cc6c57e](#)

LTI Mindtree Favorites Folder

aws Services Search [Alt+S] Mumbai Rutik

**Instances (5) Info** Last updated less than a minute ago

Find Instance by attribute or tag (case-sensitive)

All states ▾

Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
i-Offced9c5e7b5150b	Running	t2.micro	2/2 checks passed	View alarms +	ap-south-1a
i-080507bfa154955af	Running	t2.micro	2/2 checks passed	View alarms +	ap-south-1a
i-011bb6e761cc6c57e	Running	t2.micro	2/2 checks passed	View alarms +	ap-south-1a

Select an instance

**Below instance**

i-011bb6e761cc6c57e Running t2.micro 2/2 checks passed View alarms + ap-south-1a

Successfully connected to the instance created by cloud formation.

root@ip-172-31-35-4:~

Microsoft Windows [Version 10.0.22631.4037]  
(c) Microsoft Corporation. All rights reserved.

```
C:\Users\10748011>cd downloads
C:\Users\10748011\Downloads>notepad ec2.yml

C:\Users\10748011\Downloads>ssh -i "dev.pem" ec2-user@ec2-15-206-173-253.ap-south-1.compute.amazonaws.com
The authenticity of host 'ec2-15-206-173-253.ap-south-1.compute.amazonaws.com (15.206.173.253)' can't be established.
ED25519 key fingerprint is SHA256:sYL7HabM2ip59hlPx++acs6c7oQ6NCFdfAg0CndieKk.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-15-206-173-253.ap-south-1.compute.amazonaws.com' (ED25519) to the list of known hosts.

Amazon Linux 2023
https://aws.amazon.com/linux/amazon-linux-2023

[ec2-user@ip-172-31-35-4 ~]$ sudo su -
[root@ip-172-31-35-4 ~]#
```

CloudShell

Created security group successfully.

## Security group : stack1-MySecurityGroup-W59M2XJBdZUq

The screenshot shows the AWS Security Groups console with the following details:

Name	Security group ID	Description	VPC ID
stack1-MySecurityGroup-W59M2XJBdZUq	sg-0865ef3e7d3339d73	Enable SSH access	vpc-0f477050281e279da
Owner	Inbound rules count 1 Permission entry	Outbound rules count 1 Permission entry	

Creation of instance from cloud formation is successful.

Q4) Creating file system can be accessed in same region but in different zones.

Creating an EFS in ohio to share the data in same regions across different zones.

1)

The screenshot shows the AWS EFS console with the following message:

File system (fs-07163f38f96557b1c) is creating.

The file system list table includes the following columns:

Name	File system ID	Encrypted	Total size	Size in Standard	Size in IA	Size Arch
region-based	fs-07163f38f96557b1c	Encrypte d	0 Bytes	0 Bytes	0 Bytes	0 By

Now I will create 3 different instance in 3 different zones but in same region.

- a) Created instance in zone us-east-2a zone:

Instances (1/1) <a href="#">Info</a>		Last updated less than a minute ago	<a href="#">Connect</a>	Instance state ▾	Actions ▾	<a href="#">Launch instances</a>	▼
Instance ID	Instance state ▾	Instance type ▾	Status check	Alarm status	Availability Zone ▾	P	...
i-0ca736d6bc0d3977f	<span>Running</span> <a href="#">Q</a> <a href="#">Q</a>	t2.micro	<span>Initializing</span>	<a href="#">View alarms</a> +	us-east-2a	e	...

- b) Created instance in us-east-2b zone:

Instances (1/2) <a href="#">Info</a>		Last updated less than a minute ago	<a href="#">Connect</a>	Instance state ▾	Actions ▾	<a href="#">Launch instances</a>	▼
Instance ID	Instance state ▾	Instance type ▾	Status check	Alarm status	Availability Zone ▾	P	...
i-02f7cf46cbc4665b7	<span>Running</span> <a href="#">Q</a> <a href="#">Q</a>	t2.micro	<span>Initializing</span>	<a href="#">View alarms</a> +	us-east-2b	e	...

- c) Created instance for us-east-2c zone:

Instances (1/3) <a href="#">Info</a>		Last updated less than a minute ago	<a href="#">Connect</a>	Instance state ▾	Actions ▾	<a href="#">Launch instances</a>	▼
Instance ID	Instance state ▾	Instance type ▾	Status check	Alarm status	Availability Zone ▾	P	...
i-0178df0bd8fcf706b	<span>Running</span> <a href="#">Q</a> <a href="#">Q</a>	t2.micro	<span>Initializing</span>	<a href="#">View alarms</a> +	us-east-2c	e	...

## 2) Configure EFS to allow NFS rule in security Group

Chosen security group which has **NFS rule** allowed in it : sg: sgforefs

Owner 039612874025	Inbound rules count 2 Permission entries	Outbound rules count 1 Permission entry																		
<a href="#">Inbound rules</a> <a href="#">Outbound rules</a> <a href="#">Tags</a>																				
<b>Inbound rules (2)</b> <a href="#">C</a> <a href="#">Manage tags</a> <a href="#">Edit inbound rules</a>																				
<a href="#">Search</a> <a href="#">&lt;</a> <a href="#">1</a> <a href="#">&gt;</a> <a href="#">⚙️</a>																				
<table border="1"> <thead> <tr> <th><input type="checkbox"/></th> <th>Name</th> <th>Security group rule...</th> <th>IP version</th> <th>Type</th> <th>Protocol</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td>-</td> <td>sgr-0de722a87ec17eb0d</td> <td>IPv4</td> <td>NFS</td> <td>TCP</td> </tr> <tr> <td><input type="checkbox"/></td> <td>-</td> <td>sgr-0b7728b71fd3025...</td> <td>IPv4</td> <td>SSH</td> <td>TCP</td> </tr> </tbody> </table>			<input type="checkbox"/>	Name	Security group rule...	IP version	Type	Protocol	<input type="checkbox"/>	-	sgr-0de722a87ec17eb0d	IPv4	NFS	TCP	<input type="checkbox"/>	-	sgr-0b7728b71fd3025...	IPv4	SSH	TCP
<input type="checkbox"/>	Name	Security group rule...	IP version	Type	Protocol															
<input type="checkbox"/>	-	sgr-0de722a87ec17eb0d	IPv4	NFS	TCP															
<input type="checkbox"/>	-	sgr-0b7728b71fd3025...	IPv4	SSH	TCP															

Configured security groups for efs.

The screenshot shows the AWS EFS console with the following details:

- Elastic File System** sidebar: File systems, Access points, AWS Backup, AWS DataSync, AWS Transfer, Documentation.
- Network Access Configuration:**
  - Mount target 1: Availability zone us-east-2a, Subnet ID subnet-0dc42027d, IP address 172.31.11.74, Security group sg-035b6b8e7f4c (selected).
  - Mount target 2: Availability zone us-east-2b, Subnet ID subnet-0a56aa78ff, IP address 172.31.20.205, Security group sg-035b6b8e7f4c (selected).
  - Mount target 3: Availability zone us-east-2c, Subnet ID subnet-036134b1c, IP address 172.31.42.43, Security group sg-035b6b8e7f4c (selected).
- CloudShell** tab: Shows a terminal session with the following command history:

```
root@ip-172-31-1-225:~# df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev           4.0M   4.0M     0% /dev
tmpfs          475M   475M     0% /dev/shm
tmpfs          190M  440K   190M  1% /run
/dev/xvda1      8.0G  1.6G   6.5G  20% /
tmpfs          475M   475M     0% /tmp
/dev/xvda128    10M   1.3M   8.7M  13% /boot/efi
tmpfs          95M     0     95M  0% /run/user/1000
[ec2-user@ip-172-31-1-225 ~]$
```

EFS is configured.

- 4) Attach efs to one of the instance. And created data files to share among other people in same region but in different zones.

The terminal window shows the following session:

```
root@ip-172-31-1-225:~#
The authenticity of host 'ec2-3-145-38-35.us-east-2.compute.amazonaws.com (3.145.38.35)' can't be established.
ED25519 key fingerprint is SHA256:ZvDyLgvvdVOPubF75S3IAAq7n1ZtB0TPdakxAJnioVY.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-3-145-38-35.us-east-2.compute.amazonaws.com' (ED25519) to the list of known hosts.
[ec2-user@ip-172-31-1-225 ~]$ sudo su -
[root@ip-172-31-1-225 ~]# mkdir /data-instance-2a
[root@ip-172-31-1-225 ~]# ls /
bin  data-instance-2a  etc  lib  local  mnt  proc  run  srv  tmp  var
boot dev          home  lib64 media  opt  root  sbin  sys  usr
[root@ip-172-31-1-225 ~]# df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev           4.0M   4.0M     0% /dev
tmpfs          475M   475M     0% /dev/shm
tmpfs          190M  440K   190M  1% /run
/dev/xvda1      8.0G  1.6G   6.5G  20% /
tmpfs          475M   475M     0% /tmp
/dev/xvda128    10M   1.3M   8.7M  13% /boot/efi
tmpfs          95M     0     95M  0% /run/user/1000
[root@ip-172-31-1-225 ~]#
```

Initially there is no data and also no mounted efs on this instance

So mounted instance using following commands:

`sudo mount -t nfs4 -o`

`nfsvers=4.1,rsize=1048576,wsize=1048576,hard,timeo=600,retrans=2,noresvport 172.31.11.74:/efs`

So it is mounted on /data-instance-2a directory .

Now will create data in the same directory.

```
w AutoSave ⚡ OFF 🌐 🔍 Document1 - Word 🛡 No Label Search
File [root@ip-172-31-1-225:~/data-ii] + 
Paste Microsoft Search (Alt+Q)
Clipboard
[root@ip-172-31-1-225 ~]# sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,timeo=600,retrans=2,noresvport 172.31.11.74:/data-instance-2a
[root@ip-172-31-1-225 ~]# df -h
Filesystem      Size   Used  Avail Use% Mounted on
/devtmpfs        4.0M     0  4.0M  0% /dev
tmpfs           475M     0  475M  0% /dev/shm
tmpfs          196M  452K 190M  1% /run
/dev/xvda1       8.0G  1.6G  6.5G  20% /
tmpfs           475M     0  475M  0% /tmp
/dev/xvda128    10M   1.3M  8.7M  13% /boot/efi
tmpfs           95M     0  95M  0% /run/user/1000
172.31.11.74:/  8.0E     0  8.0E  0% /data-instance-2a
[root@ip-172-31-1-225 ~]# cd /data-instance-2a
[root@ip-172-31-1-225 data-instance-2a]# tpush files-2a.txt{1..20}
-bash: tpush: command not found
[root@ip-172-31-1-225 data-instance-2a]# touch files-2a.txt{1..20}
[root@ip-172-31-1-225 data-instance-2a]# ls
files-2a.txt1  files-2a.txt12  files-2a.txt15  files-2a.txt18  files-2a.txt20  files-2a.txt5  files-2a.txt8
files-2a.txt10  files-2a.txt13  files-2a.txt16  files-2a.txt19  files-2a.txt3  files-2a.txt6  files-2a.txt9
files-2a.txt11  files-2a.txt14  files-2a.txt17  files-2a.txt2  files-2a.txt4  files-2a.txt7
[root@ip-172-31-1-225 data-instance-2a]# history
 1 sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,timeo=600,retrans=2,noresvport 172.31.11.74:/data-instance-2a
 2 df -h
 3 cd /data-instance-2a
 4 tpush files-2a.txt{1..20}
 5 touch files-2a.txt{1..20}
 6 ls
 7 history
[root@ip-172-31-1-225 data-instance-2a]#
```

So above ss shows commands for generating data into attached file system.

Also commands used to do so .

- 3) Now will connect another instance which is in another region:

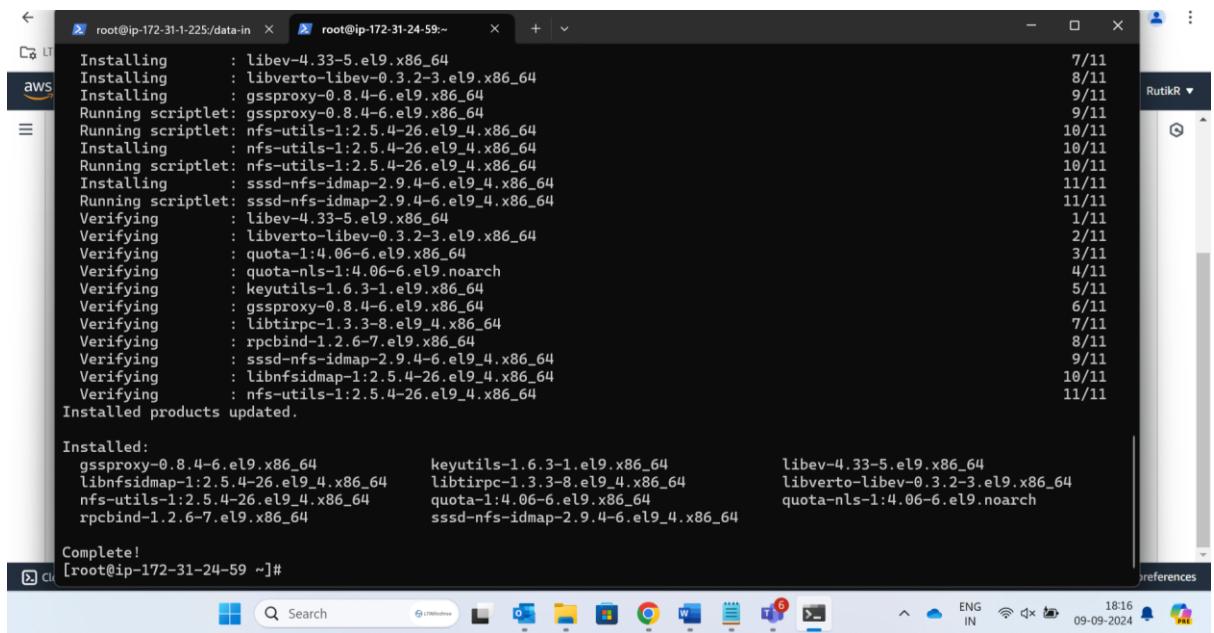
In this zone , one of person using rhel linux instance. Which will not have nfs package available.

But to connect **efs** will need **nfs-utils** package on the system.

For that Used commands are :

**Yum install nfs-utils -y**

```
Warning: Permanently added 'ec2-3-12-111-143.us-east-2.compute.amazonaws.com' (RSA) to the list of known hosts.
Register this system with Red Hat Insights: insights-client --register
Create an account or view all your systems at https://red.ht/insights-dashbo
[ec2-user@ip-172-31-24-59 ~]$ sudo su -
[root@ip-172-31-24-59 ~]# rpmquery nfs-utils
package nfs-utils is not installed
[root@ip-172-31-24-59 ~]# yum install nfs-utils -y
Updating Subscription Management repositories.
Unable to read consumer identity
```

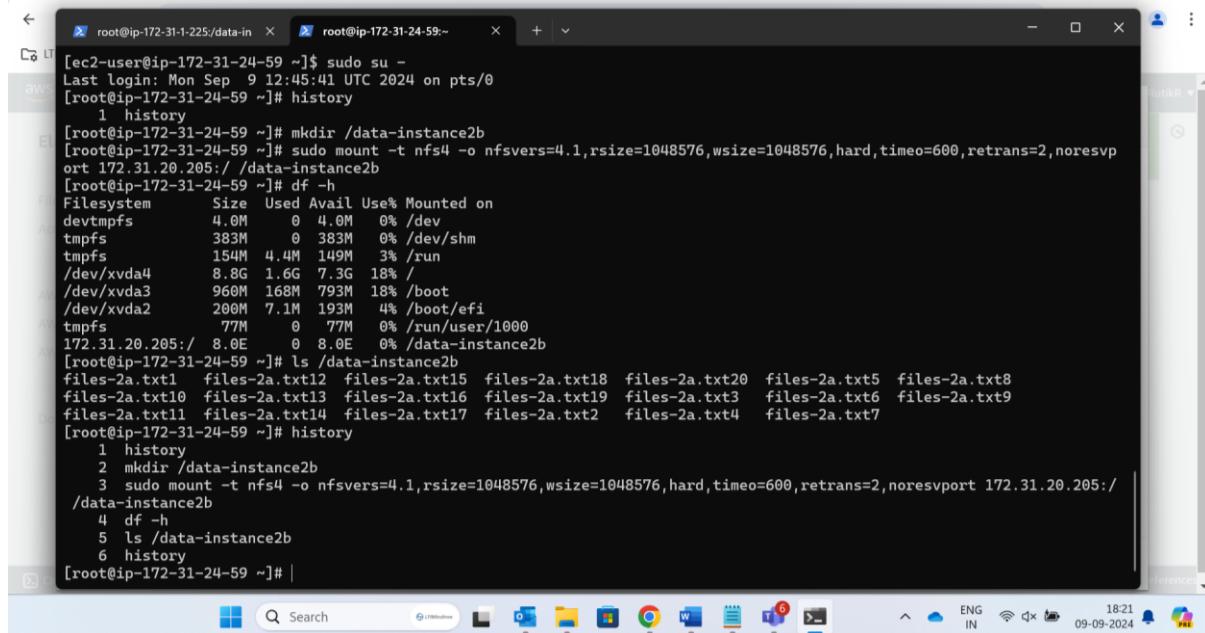


```
root@ip-172-31-1-225:/data-in | root@ip-172-31-24-59:~| + | - | x | RutikR | references |
aws
Installing : libev-4.33-5.el9.x86_64 7/11
Installing : libverto-libev-0.3.2-3.el9.x86_64 8/11
Installing : gssproxy-0.8.4-6.el9.x86_64 9/11
Running scriptlet: gssproxy-0.8.4-6.el9.x86_64 9/11
Running scriptlet: nfs-utils-1:2.5.4-26.el9_4.x86_64 10/11
Installing : nfs-utils-1:2.5.4-26.el9_4.x86_64 10/11
Running scriptlet: nfs-utils-1:2.5.4-26.el9_4.x86_64 10/11
Installing : sssd-nfs-idmap-2.9.4-6.el9_4.x86_64 11/11
Running scriptlet: sssd-nfs-idmap-2.9.4-6.el9_4.x86_64 11/11
Verifying : libev-4.33-5.el9.x86_64 1/11
Verifying : libverto-libev-0.3.2-3.el9.x86_64 2/11
Verifying : quota-1:4.06-6.el9.noarch 3/11
Verifying : quota-nls-1:4.06-6.el9.noarch 4/11
Verifying : keyutils-1.6.3-1.el9.x86_64 5/11
Verifying : gssproxy-0.8.4-6.el9.x86_64 6/11
Verifying : libtirpc-1.3.3-8.el9_4.x86_64 7/11
Verifying : rpcbind-1.2.6-7.el9.x86_64 8/11
Verifying : sssd-nfs-idmap-2.9.4-6.el9_4.x86_64 9/11
Verifying : libnfsidmap-1:2.5.4-26.el9_4.x86_64 10/11
Verifying : nfs-utils-1:2.5.4-26.el9_4.x86_64 11/11
Installed products updated.

Installed:
gssproxy-0.8.4-6.el9.x86_64      keyutils-1.6.3-1.el9.x86_64      libev-4.33-5.el9.x86_64
libnfsidmap-1:2.5.4-26.el9_4.x86_64  libtirpc-1.3.3-8.el9_4.x86_64  libverto-libev-0.3.2-3.el9.x86_64
nfs-utils-1:2.5.4-26.el9_4.x86_64  quota-1:4.06-6.el9.x86_64      quota-nls-1:4.06-6.el9.noarch
rpcbind-1.2.6-7.el9.x86_64        sssd-nfs-idmap-2.9.4-6.el9_4.x86_64

Complete!
[root@ip-172-31-24-59 ~]#
```

So below will see the commands used to mount nfs on this instance along with the data shared is visible to this instance.

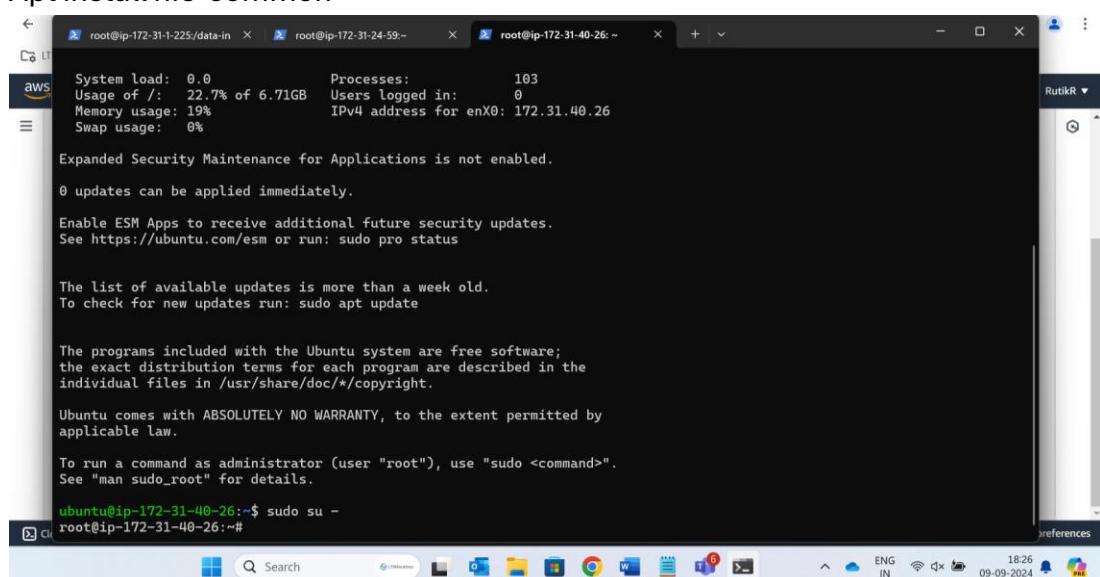


```
[ec2-user@ip-172-31-24-59 ~]$ sudo su -
Last login: Mon Sep 9 12:45:41 UTC 2024 on pts/0
[root@ip-172-31-24-59 ~]# history
1 history
[root@ip-172-31-24-59 ~]# mkdir /data-instance2b
[root@ip-172-31-24-59 ~]# sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,timeo=600,retrans=2,noresvport 172.31.20.205:/ /data-instance2b
[root@ip-172-31-24-59 ~]# df -h
Filesystem      Size   Used  Avail Use% Mounted on
devtmpfs        4.0M    0     4.0M  0% /dev
tmpfs          383M    0     383M  0% /dev/shm
tmpfs          154M   4.4M  149M  3% /run
/dev/xvda4      8.8G   1.6G   7.3G  18% /
/dev/xvda3      960M  168M  793M  18% /boot
/dev/xvda2      200M   7.1M   193M  4% /boot/efi
tmpfs           77M    0     77M  0% /run/user/1000
172.31.20.205:/ 8.0E    0     8.0E  0% /data-instance2b
[root@ip-172-31-24-59 ~]# ls /data-instance2b
files-2a.txt1  files-2a.txt12  files-2a.txt15  files-2a.txt18  files-2a.txt20  files-2a.txt5  files-2a.txt8
files-2a.txt10  files-2a.txt13  files-2a.txt16  files-2a.txt19  files-2a.txt3  files-2a.txt6  files-2a.txt9
files-2a.txt11  files-2a.txt14  files-2a.txt17  files-2a.txt2  files-2a.txt4  files-2a.txt7
[root@ip-172-31-24-59 ~]# history
1 history
2 mkdir /data-instance2b
3 sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,timeo=600,retrans=2,noresvport 172.31.20.205:/ /data-instance2b
4 df -h
5 ls /data-instance2b
6 history
[root@ip-172-31-24-59 ~]# |
```

So data sharing is successful to one of colleagues.

- 4) Now will do same things to share data to another colleague in another zone :  
Who uses ubuntu linux instance on his machine.

On ubuntu he don't have nfs package so will install this package using  
Apt install nfs-common



```
root@ip-172-31-1-225:~$ apt update
System load: 0.0      Processes:          103
Usage of /: 22.7% of 6.71GB  Users logged in: 0
Memory usage: 19%          IPv4 address for enx0: 172.31.40.26
Swap usage:  0%
Expanded Security Maintenance for Applications is not enabled.
0 updates can be applied immediately.
Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-40-26:~$ sudo su -
root@ip-172-31-40-26:~#
```

So connected to instance who uses ubuntu

Now will install dependencies for efs which has nfs file system.

Executed following commands to do so:

```
t.
Created symlink /etc/systemd/system/remote-fs.target.wants/nfs-client.target → /usr/lib/systemd/system/nfs-client.target
.
auth-rpcgss-module.service is a disabled or a static unit, not starting it.
nfs-idmapd.service is a disabled or a static unit, not starting it.
nfs-utils.service is a disabled or a static unit, not starting it.
proc-fs-nfsmount.service is a disabled or a static unit, not starting it.
rpc-gsssd.service is a disabled or a static unit, not starting it.
rpc-statd-notify.service is a disabled or a static unit, not starting it.
rpc-statd.service is a disabled or a static unit, not starting it.
rpc-svcgssd.service is a disabled or a static unit, not starting it.
Processing triggers for man-db (2.12.0-4ubuntu2) ...
Processing triggers for libc-bin (2.39-0ubuntu8.2) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-40-26:~# history
 1 apt update
 2 apt install nfs-common
 3 history
root@ip-172-31-40-26:~#
```

Now will try to mount efs system to this instance.

Efs is mounted successfully.

```
No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-40-26:~# history
 1 apt update
 2 apt install nfs-common
 3 history
root@ip-172-31-40-26:~# mkdir /data-instance2c
root@ip-172-31-40-26:~# ls /
bin          data-instance2c  home          lib          lib64        mnt          root         sbin.usr-is-merged  sys          var
bin.usr-is-merged  dev          lib          lost+found   opt          run          snap         tmp          usr
boot         etc          lib.usr-is-merged  media       proc        sbin        srv          tmp
root@ip-172-31-40-26:~# sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,timeo=600,retrans=2,noresvport 172.31.42.43:/ /data-instance2c
root@ip-172-31-40-26:~# df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/root      6.8G  1.8G  5.0G  26% /
tmpfs          479M    0  479M   0% /dev/shm
tmpfs          192M  904K  191M   1% /run
tmpfs          5.0M    0  5.0M   0% /run/lock
/dev/xvda16     881M   76M  744M  10% /boot
/dev/xvda15     105M   6.1M  99M   6% /boot/efi
tmpfs          96M   12K  96M   1% /run/user/1000
172.31.42.43:/  8.0E    0  8.0E   0% /data-instance2c
root@ip-172-31-40-26:~#
```

Now will check if data is available or not.

```
tmpfs          479M    0  479M  0% /dev/shm
tmpfs          192M  904K 191M  1% /run
tmpfs          5.0M    0  5.0M  0% /run/lock
/dev/xvda16   881M   76M 744M 10% /boot
/dev/xvda15   105M   6.1M 99M  6% /boot/efi
tmpfs          96M   12K  96M  1% /run/user/1000
172.31.42.43:/ 8.0E    0  8.0E  0% /data-instance2c
root@ip-172-31-40-26:~# ls /data-instance2c
files-2a.txt1  files-2a.txt12  files-2a.txt15  files-2a.txt18  files-2a.txt20  files-2a.txt5  files-2a.txt8
files-2a.txt10  files-2a.txt13  files-2a.txt16  files-2a.txt19  files-2a.txt3  files-2a.txt6  files-2a.txt9
files-2a.txt11  files-2a.txt14  files-2a.txt17  files-2a.txt2  files-2a.txt4  files-2a.txt7
root@ip-172-31-40-26:~# |
```

Here is also data available.

Hence we successfully created and efs to share files to persons in different zone but in same region.