CONTENTS

CLOUD SERVICES

Cloud Computing often referred to as “the cloud”, in simple terms means storing or accessing your data and programs over the internet rather than your own hard drive.

Three Types of Cloude Services

- ❖ SaaS (Software as a Service)
- ❖ PaaS (Platform as a Service)
- ❖ IaaS (Infrastructure as a Service)

SaaS (Software as a Service)

In this service, the Cloud Provider leases applications or software which are owned by them to its client. The client can access this software on any device which is connected to the Internet using tools such as a web browser, an app, etc.

Example: Google Sheets as an example here. The benefits provided to the consumer include the ability to create, edit and update spreadsheets from anywhere, with multiple users able to edit at one time. But the google sheets are owned by google only, we only use these services.

Advantages of SaaS Cloud Computing

- ❖ SaaS can make you several times more productive by letting you quickly access your data anywhere, anytime.
- ❖ With SaaS, you do not have to worry about the expense of installing software on each system. Instead, you can get your business up and running at a minimal cost.

- ❖ You do not have to worry about updating your SaaS apps as they are always secure and up-to-date.

Disadvantages of SaaS Cloud Computing

- ❖ Internet connectivity is necessary if you want to use a SaaS solution.
- ❖ You do not have much control over the data you share.

PaaS (Platform as a Service)

In this service, the Cloud Provider gives the ability to the customer to deploy customer created applications using programming languages, tools, etc that are provided by the Cloud Provider. The customer cannot control the underlying architecture including operating systems, storage, servers, etc.

Example:
This service would make sense to you only if you are a developer since this service provides you a platform for developing applications, like Google App Engine, Microsoft Azure, google cloud..etc

Advantages of PaaS Cloud Computing

- ❖ With PaaS, businesses can save themselves from the complex and costly process of having to purchase and manage software licenses.
- ❖ PaaS lets developers work on applications remotely from anywhere.

Disadvantages of PaaS Cloud Computing

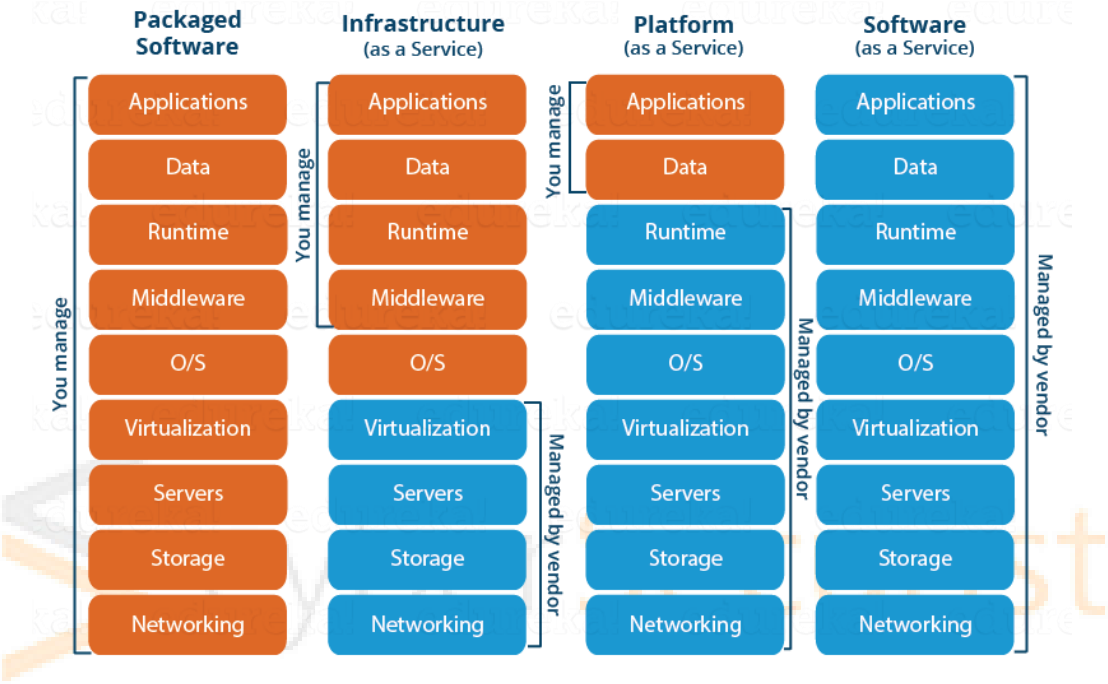
- ❖ With PaaS, you must rely heavily on the vendor for speed, support, and reliability.
- ❖ PaaS solutions are often vulnerable to data security issues.

IaaS (Infrastructure as a Service)

In this service the Cloud Provider provides the customer with virtual machines and other resources as a service, they abstract the user from

the physical machine, location, data partitioning, etc. If the user wants a Linux machine, he gets a Linux machine, he will not worry about the physical machine or the networking of the system on which the OS is installed, simple.

For Example, AWS (Amazon Web Services) is IaaS, like *AWS EC2*.



AWS/Azure spinning machine

STEPS

- Go to the Amazon AWS service website
- Click to the services > all services > view all services
- Choose EC2
- Launch instance
- Choose which OS you want to deploy
- Create a new key pair. Add your key pair name and click the create key pair button.
- Download it.
- Launch instance.
- You see the Successfully initiated launch of instance.
- Go to the view all instances.
- you see your current instances are running.

- Click the instance ID you will see all the details about your instance.
- Click the connect button to connect your instance.
- You can see your Instance ID, public IP Address, Username.
- Agin click connect button.

Accessing the machines via ssh/rdp

SSH

Change the permission of your key, which you download

$ chmod 400 <key>

$ sudo ssh <username>@<IP> -I <key>

RDP

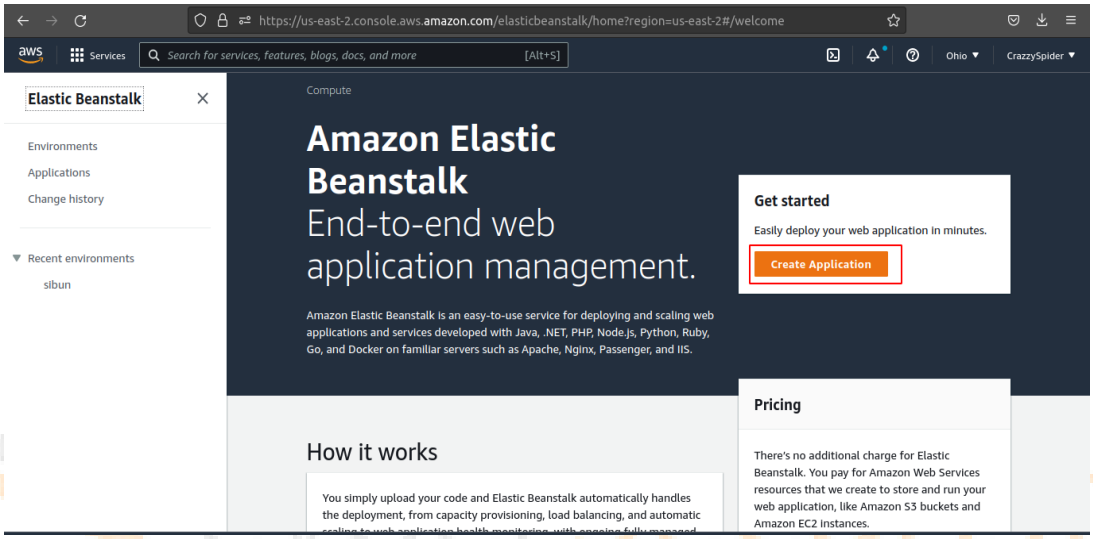
- Open Remmina
- Enter your RDP link
- Then Enter your user id and password and hit enter

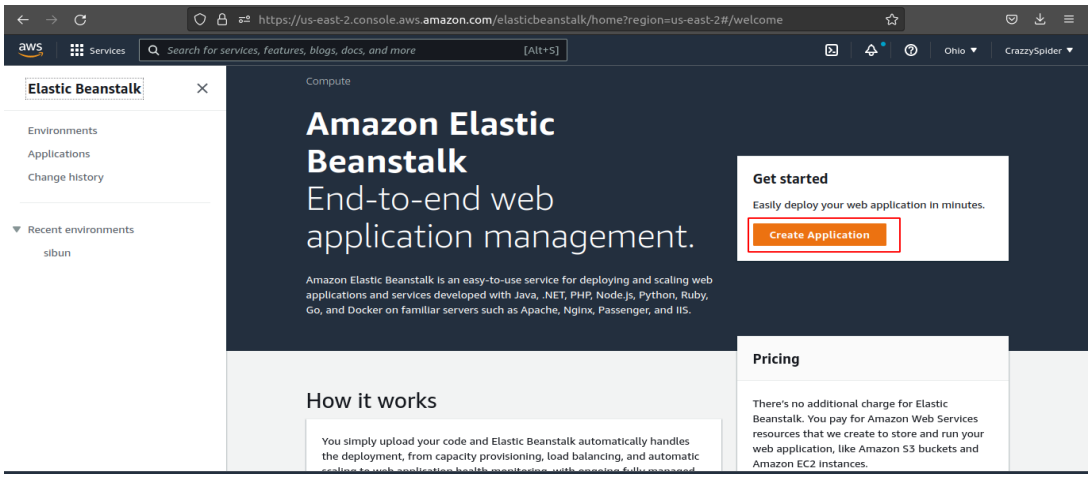
Deploying the web application on cloud

Using Elastic Beanstalk

- Open AWS and search Elastic Beanstalk or click this link.
- Create application
- Add application name
- Choose Platform (like: python, docker, PHP, .NET)

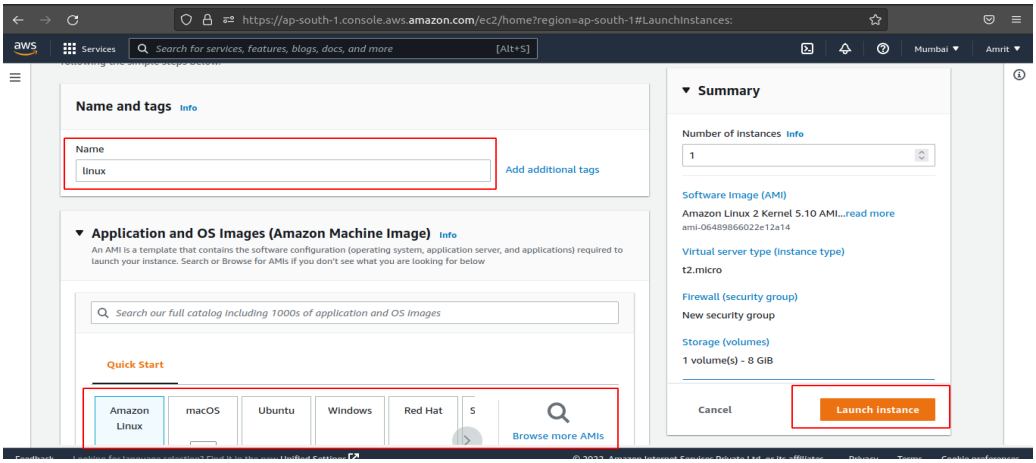
- Then gives two options
- 1. Sample application
- 2. Upload your code
- Click Create application
- On the right-hand side, you see your application name, expand it.
- Click “Go to environment.”
- You see your application is ready.



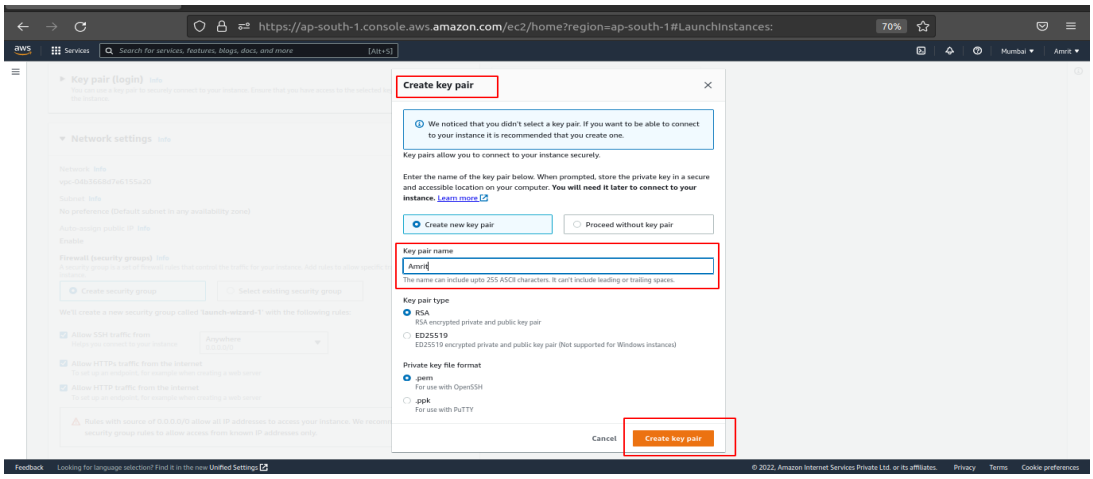


Deploying the web application using EC2

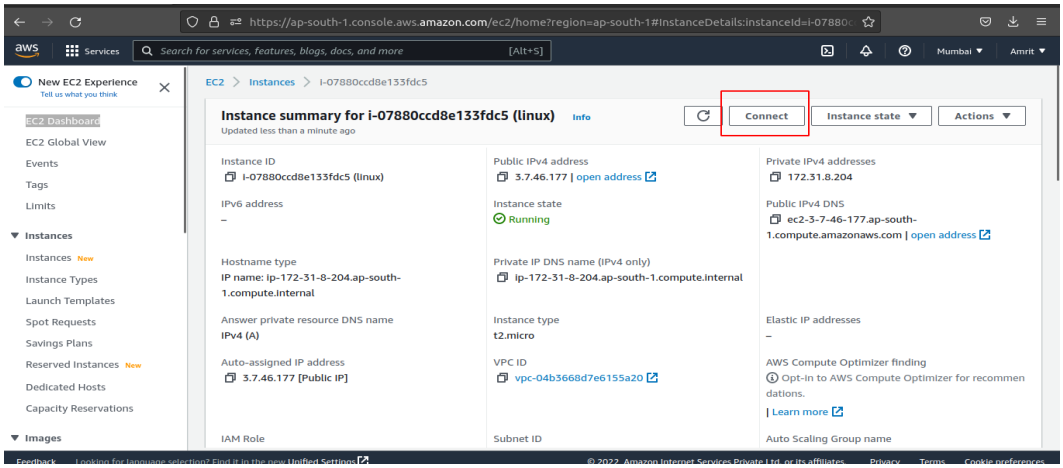
- Launch an EC2 Instance
- Choose linux machine
- Configure Instance as per your required
- Launch instance



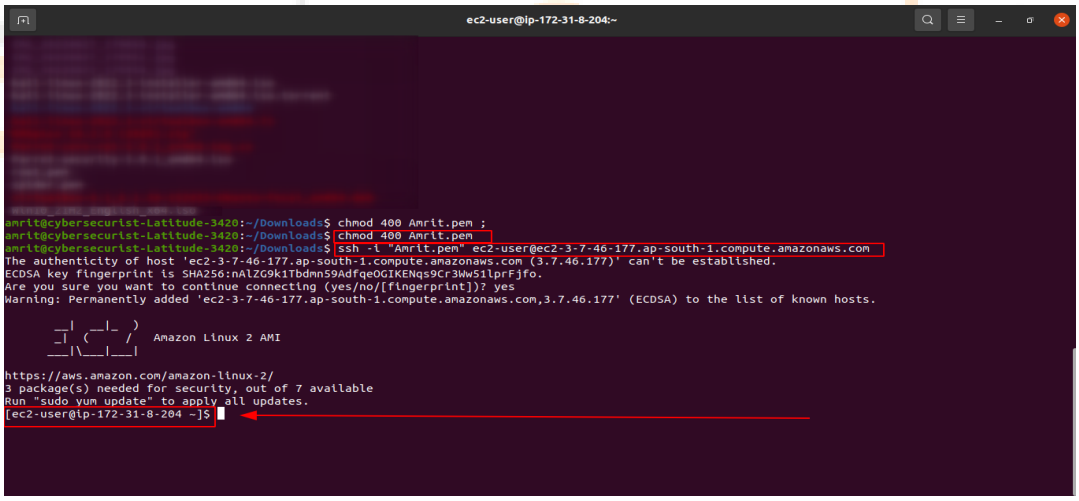
- Create key pair
- Add your key pair name
- Create key pair



- Go to the EC2 Dashboard
- See all the instances
- Click your instance and press the connect button.



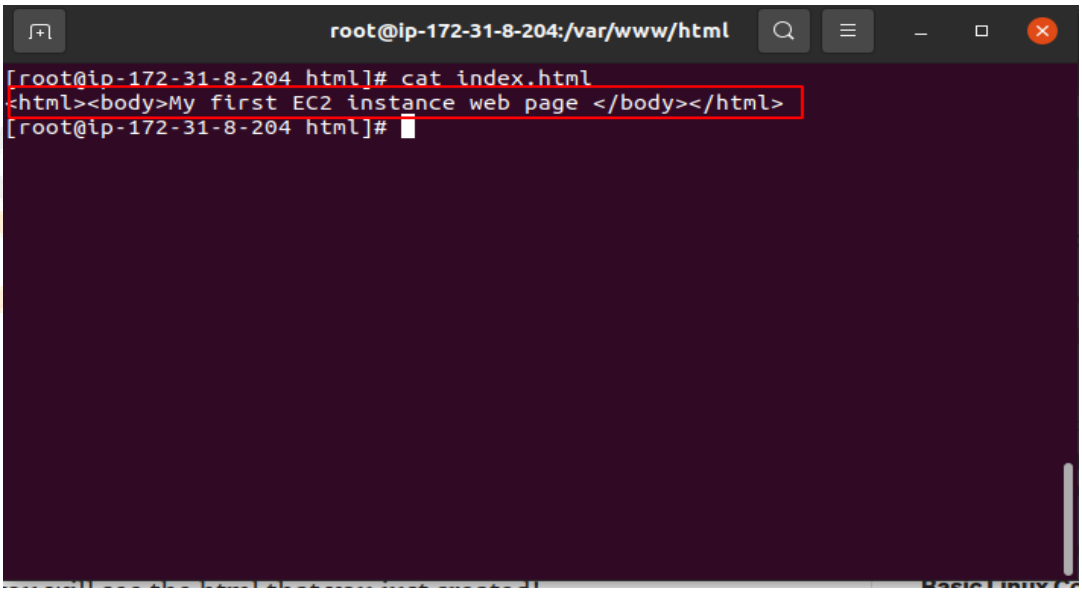
- Connect SSH to EC2
- First change the key –file permission using chmod 400
- The connet using ssh command
- ssh -i "Amrit.pem" ec2-user@ec2-3-7-46-177.ap-south-1.compute.amazonaws.com



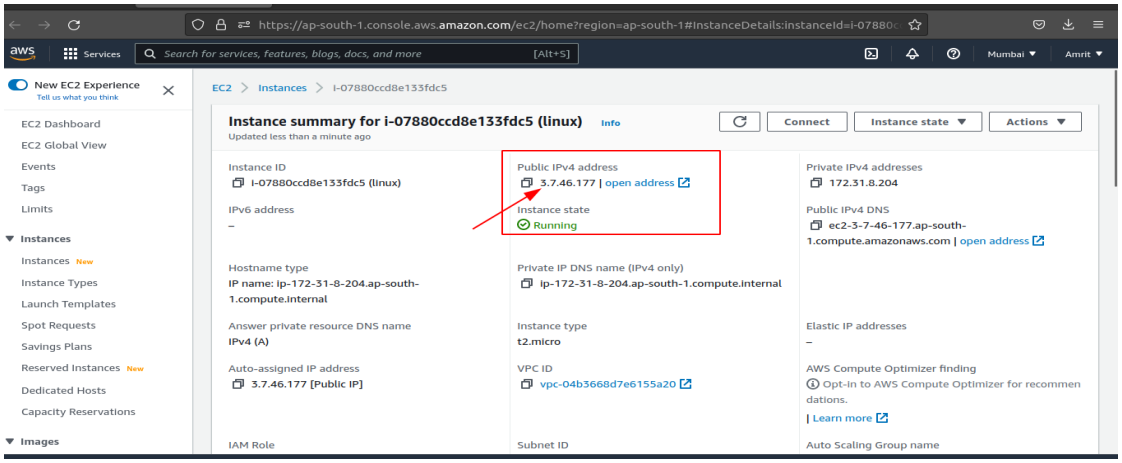
- Install an apache webserver
- **$ yum install httpd –y**
- Start the webserver
- **$ service httpd start**
- Configure the web server to restart if it gets stopped
- **$ chkconfig httpd on**

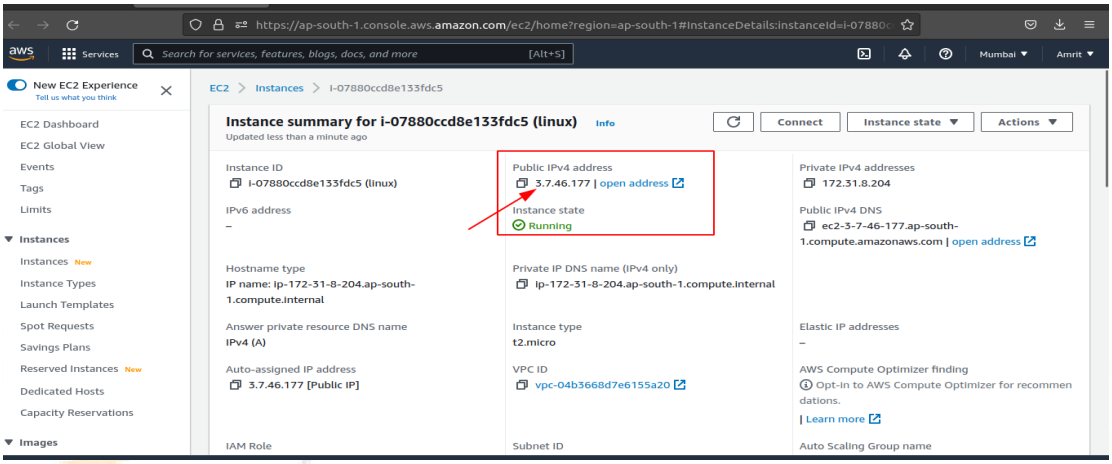
Add a static HTML file to be served

- By default, the apache web server will display the index.html file found in ***/var/www/html*** directory in the root path of your website.
- In this section you will create an index.html file to be served.
- Navigate to the directory
- **$ cd /var/www/html**
- create an index.html file in this directory
- **$ nano index.html**
- Add your HTML code
- **<html><body>My first EC2 instance web page </body></html>**



Navigate back to the EC2 dashboard in the AWS console and copy the Public DNS(IPV4) of your instance into your clipboard. Paste that address into your browser. If all went well, you will see the html that you just created!



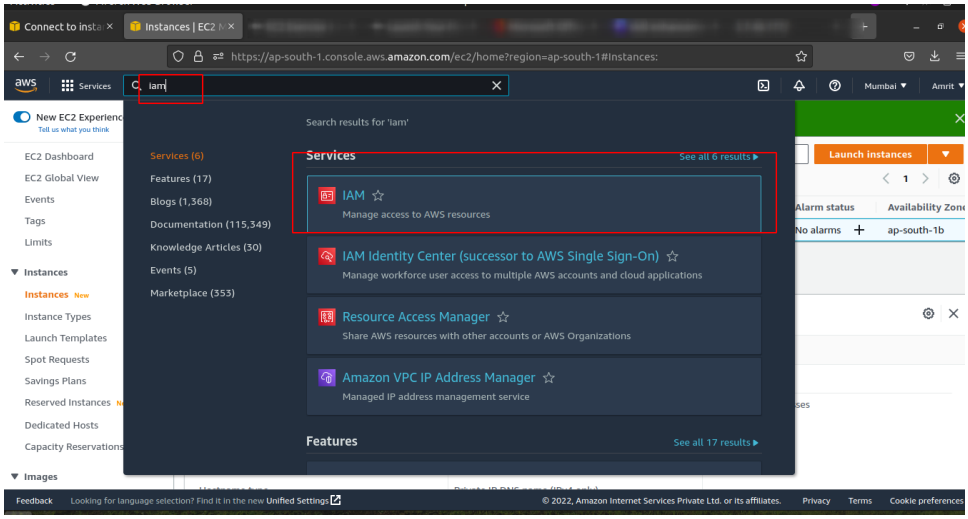


Configuring the access to the application

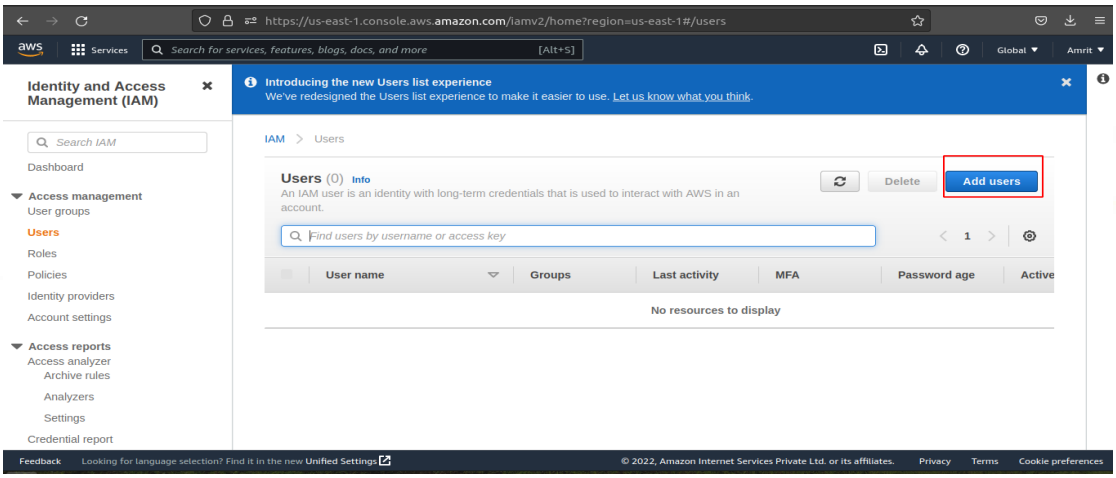
It is accessed outside the network.:)

Configure Access management- IAM

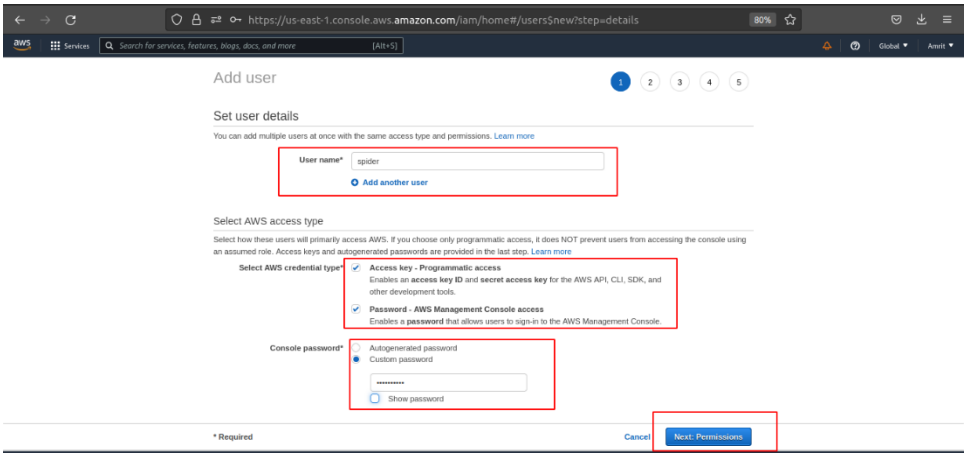
- Goto search and search for IAM

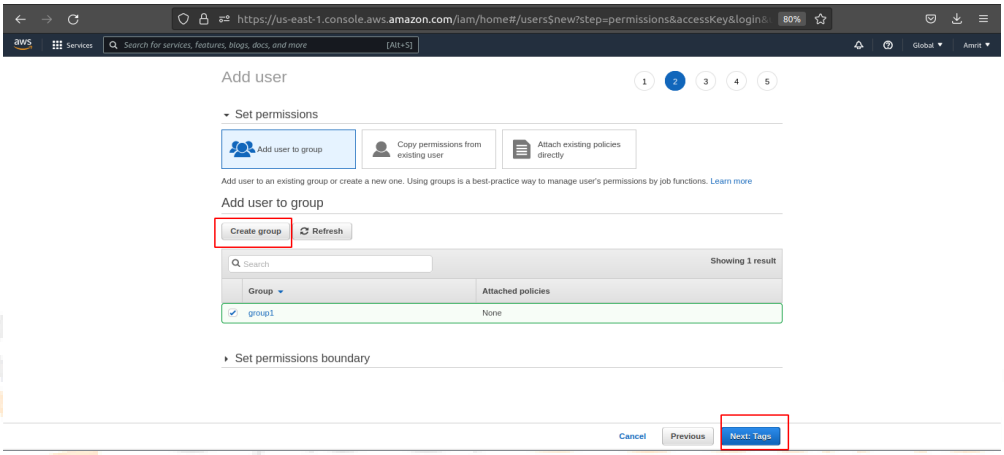


- IAM dashboard will open
- On the left side goto users
- Click on Add user

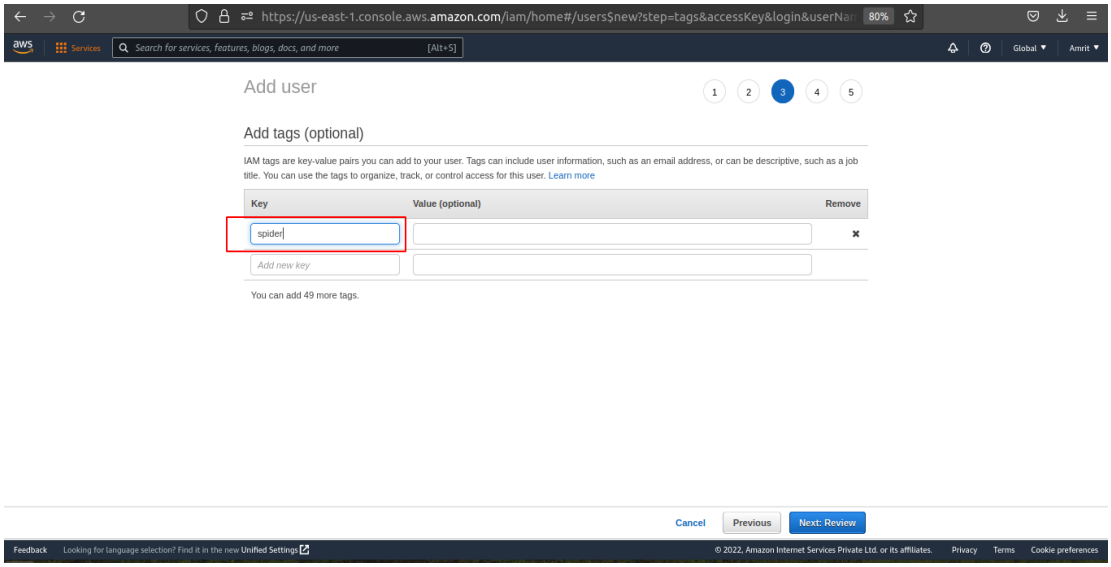


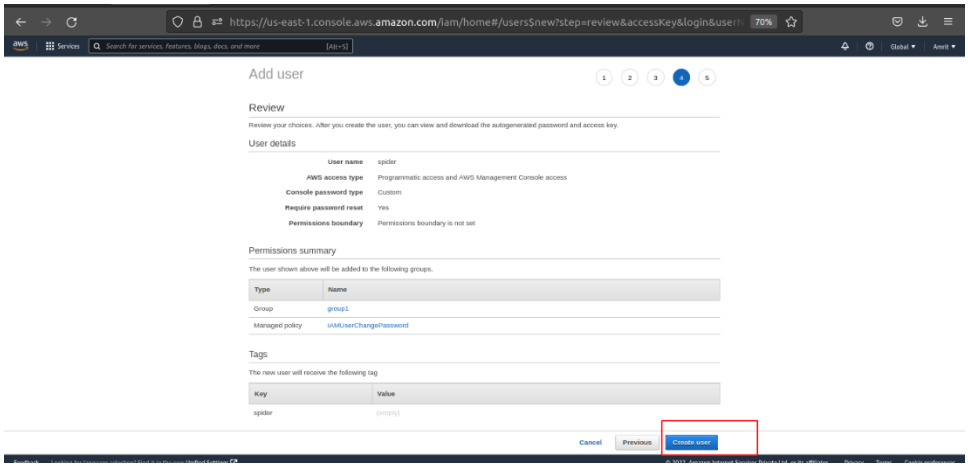
- Add User name
- Select AWS credential type
- Set your password
- Hit the “next permission” button



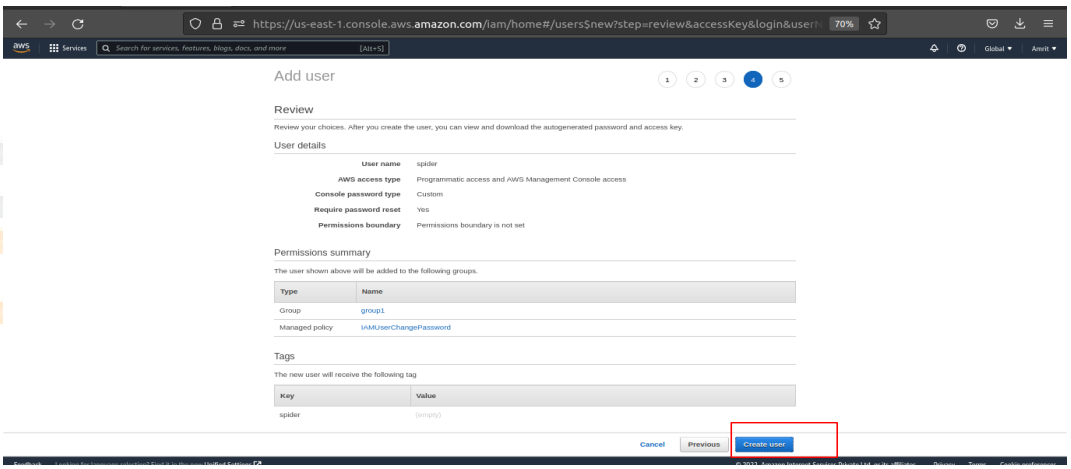


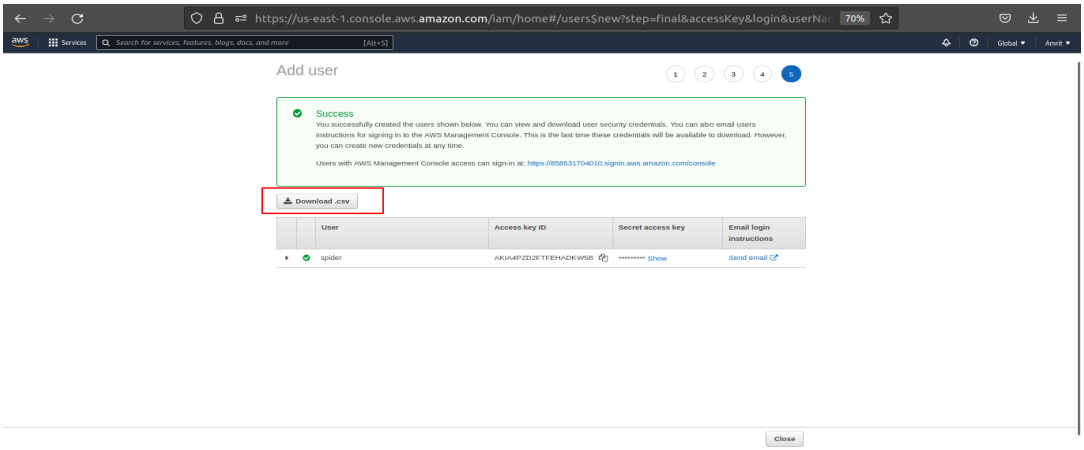
➢ Then goto the user groups section

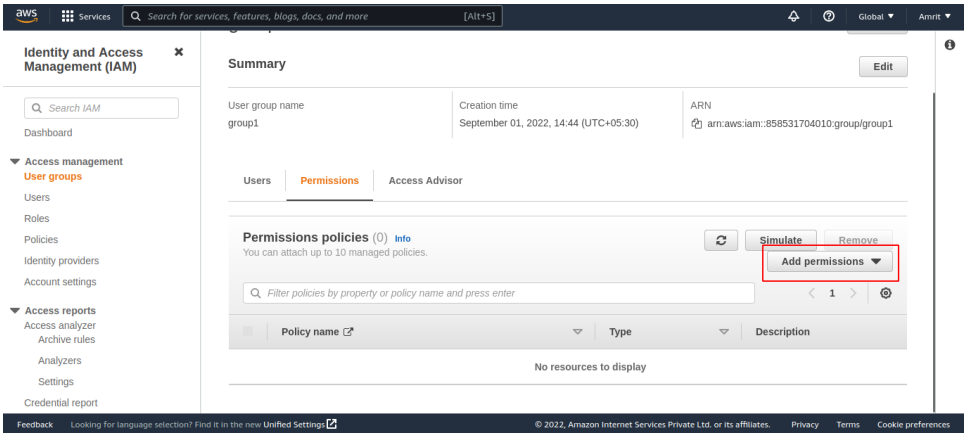




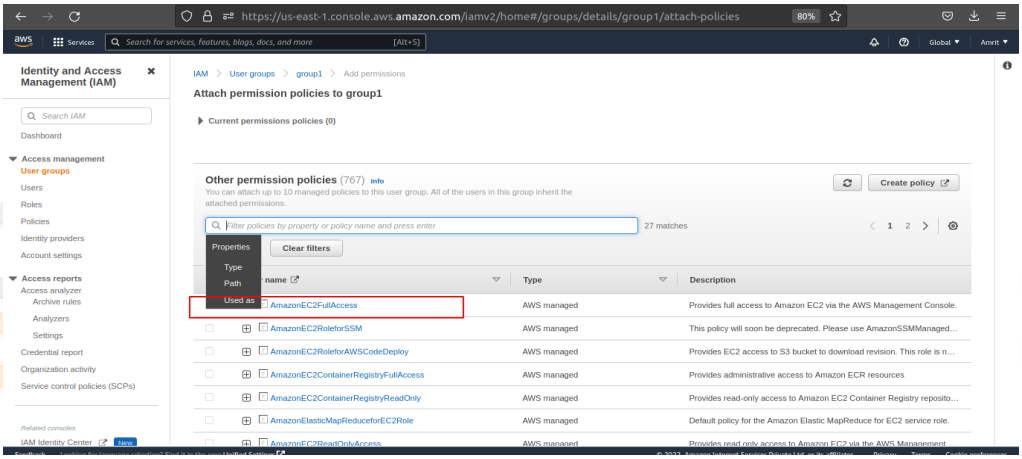
- Create a User Group
- Add the policies



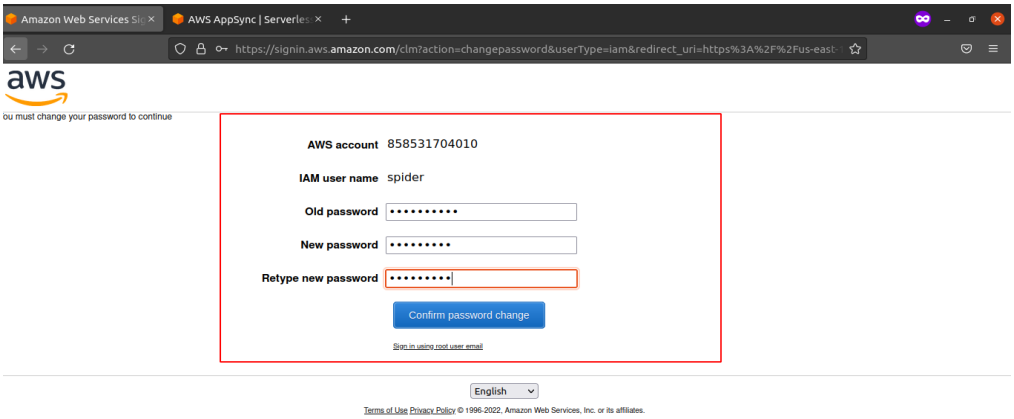


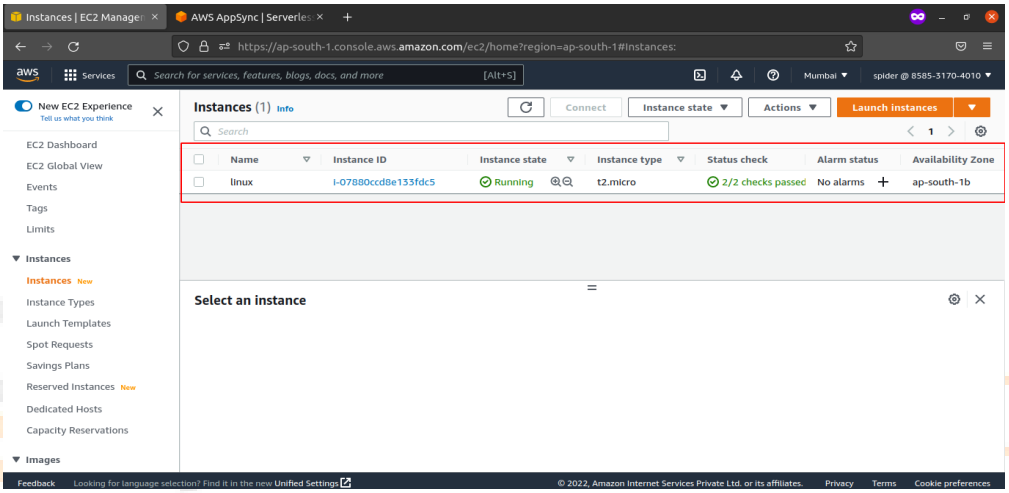


- Under policies select the **AmazonEC2FullAccess**
- Add the policy



- Save
- Add the newly created user to the group
- Now logout
- Login as a IAM user
- Add the **12 digit Account ID**
- You will get this id in the root account on the right hand top corner
- Add the username and password
- Login





- You will get this id in the root account on the right hand top corner
- Add the username and password
- Login

Top 20 Linux commands including user management/network/configuration/setting/proxy/services

- userdel
- Addgroup
- Groupdel
- Usermod

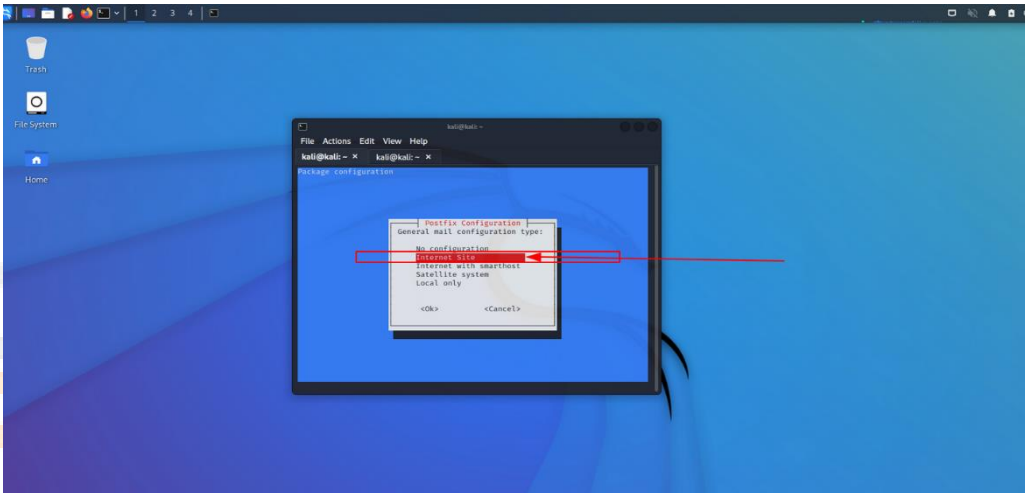
- Ifconfig
- Ping
- Netstat
- Nslookup
- arp

- Sudo service <servicename> start
- Sudo service <servicename> stop
- Sudo service <servicename> status
- Sudo service <servicename> enable
- Sudo service <servicename> disable
- Sudo systemctl enable <servicename>
- Sudo systemctl disable <servicename>
- service --status-all

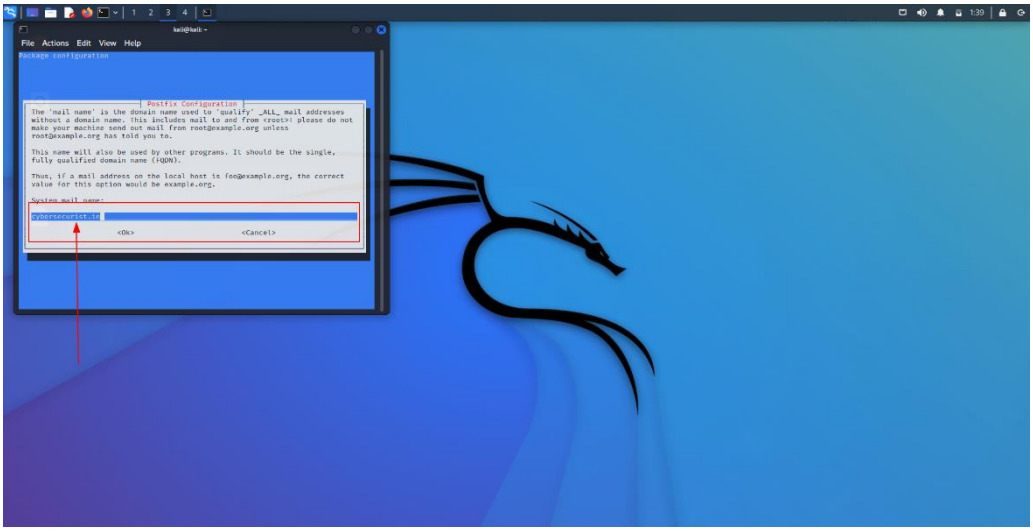
Creative services like SMTP/FTP login and send mail/file.

SMTP

- Install Postfix
- **$ sudo apt-get install postfix**
- The first part of the Postfix installation is a text-base user interface. Use you keyboard to select *Internet Site* for the type of mail configuration.



- Then Add a Domain name :



- Befor Starting you most get your **google App password.**
- Steps of Get google password:

Create & use App Passwords:

If you use 2-Step-Verification and get a "password incorrect" error when you sign in, you can try to use an App Password.

1. Go to your Google Account.
2. Select **Security**.
3. Under "Signing in to Google," select **App Passwords**. You may need to sign in. If you don't have this option, it might be because:
    a. 2-Step Verification is not set up for your account.
    b. 2-Step Verification is only set up for security keys.
    c. Your account is through work, school, or other organization.
    d. You turned on Advanced Protection.
4. At the bottom, choose **Select app** and choose the app you using › **Select device** and choose the device you're using › **Generate**.
5. Follow the instructions to enter the App Password. The App Password is the 16-character code in the yellow bar on your device.
6. Tap **Done**.

Configure SASL with Your Gmail Credentials

- SASL, which stands for Simple Authentication and Security Layer, is basically what it sounds like. SASL makes it easy for applications to authenticate with various internet technologies.

- Create a the file ***/etc/postfix/sasl/sasl_passwd***
- And add your Gmail address and app password to it like this:

[smtp.gmail.com]:587 amritprasad55@gmail.com:qodjkozoaqdmyqll

- In this case, ***smtp.gmail.com*** is the address of the Gmail SMTP server and 587 is the SMTP port.
- Next, create a hash database file with the following postmap command.

$ sudo postmap /etc/postfix/sasl/sasl_passwd

Note that now you will have a database file at

/etc/postfix/sasl/sasl_passwd.db

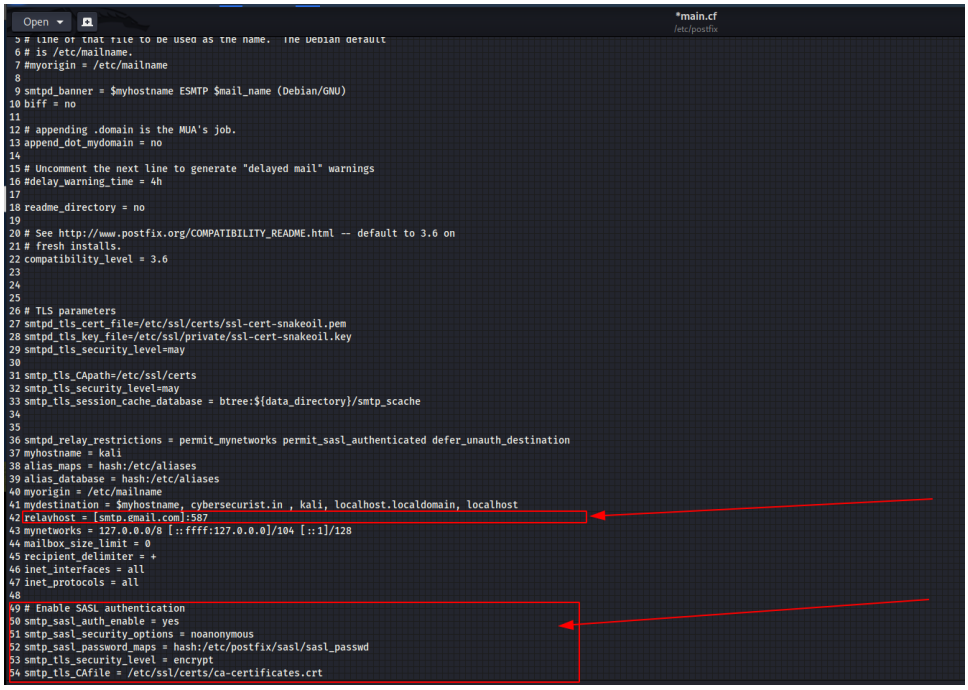
To protect the plain-text password, change the owner and permission for the SASL files as follows:

$ sudo chown kali:kali /etc/postfix/sasl/sasl_passwd /etc/postfix/sasl/sasl_passwd.db

$ sudo chmod 0600 /etc/postfix/sasl/sasl_passwd /etc/postfix/sasl/sasl_passwd.db

One more configuration file to edit here. To tell Postfix to use Gmail servers to send mail, set the relay value in the "**/etc/postfix/main.cf**" file.

Also, add the following to the end of "**/etc/postfix/main.cf**" to enable SASL authentication for Postfix.

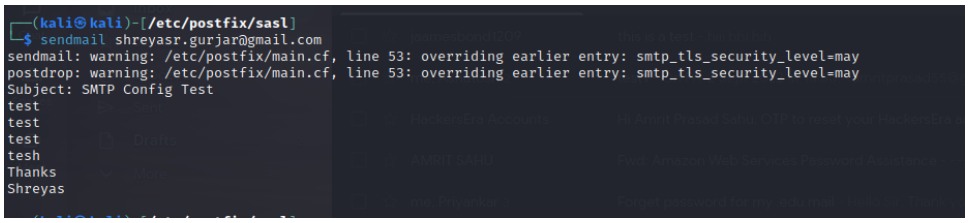


Finally, restart Postfix to apply our configuration changes.

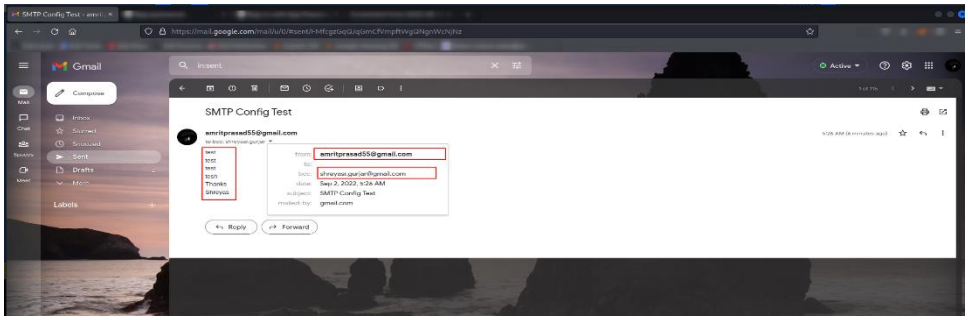
$ sudo systemctl restart postfix

Test Sending Email from Gmail

Use the *sendmail* command to send a test email.



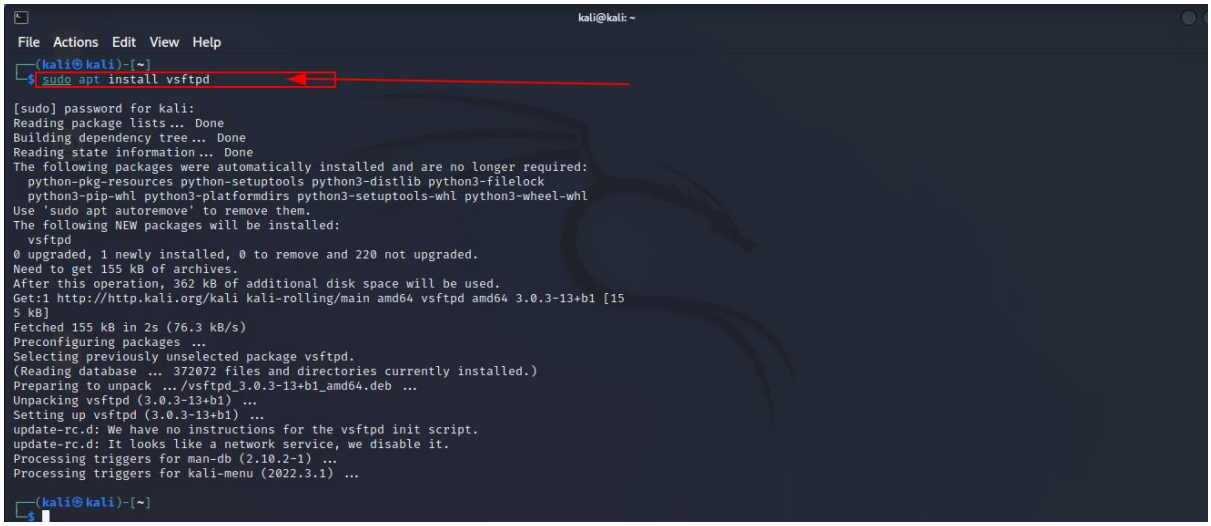
Press **“CTRL + D”** to send mail.



FTP

Install vsftpd in your machin

$ sudo apt install vsftpd



- After install
- Eanable ftp

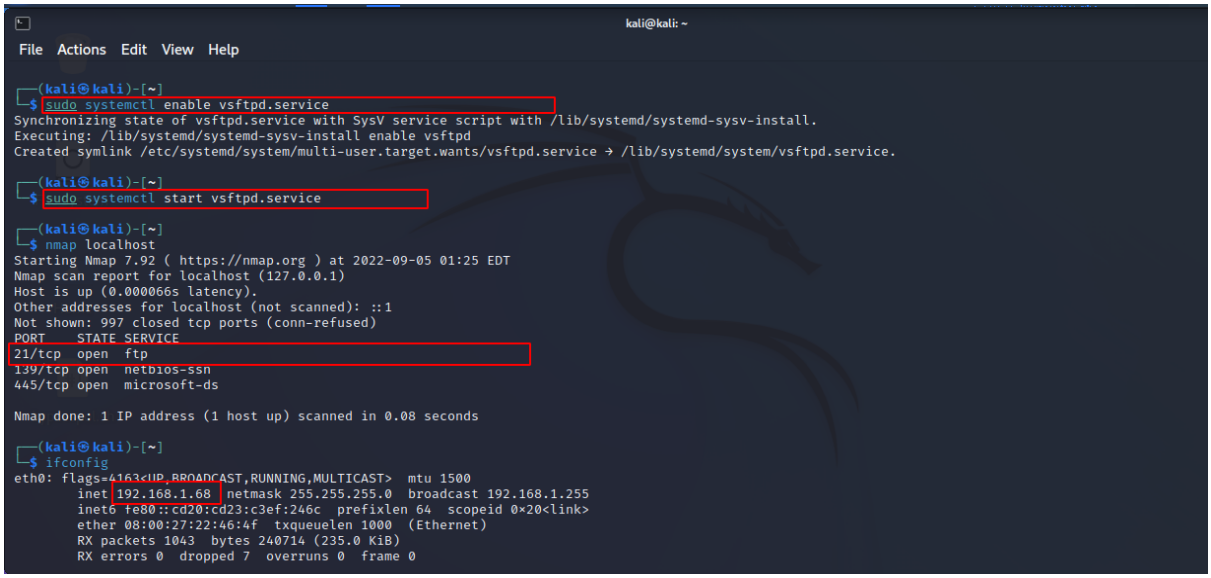
$ sudo systemctl enable vsftpd.service

- Start ftp

$ sudo systemctl start vsftpd.service

- Check ftp open or not

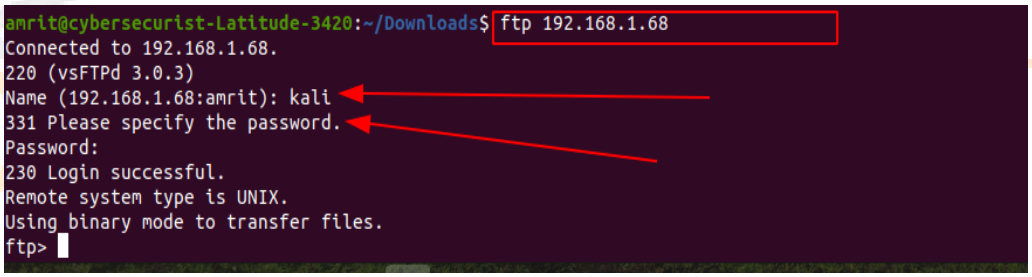
$ sudo systemctl start vsftpd.service



- Connect to the ftp service using host machine

  $ ftp <$IP>

- Enter your user name and password

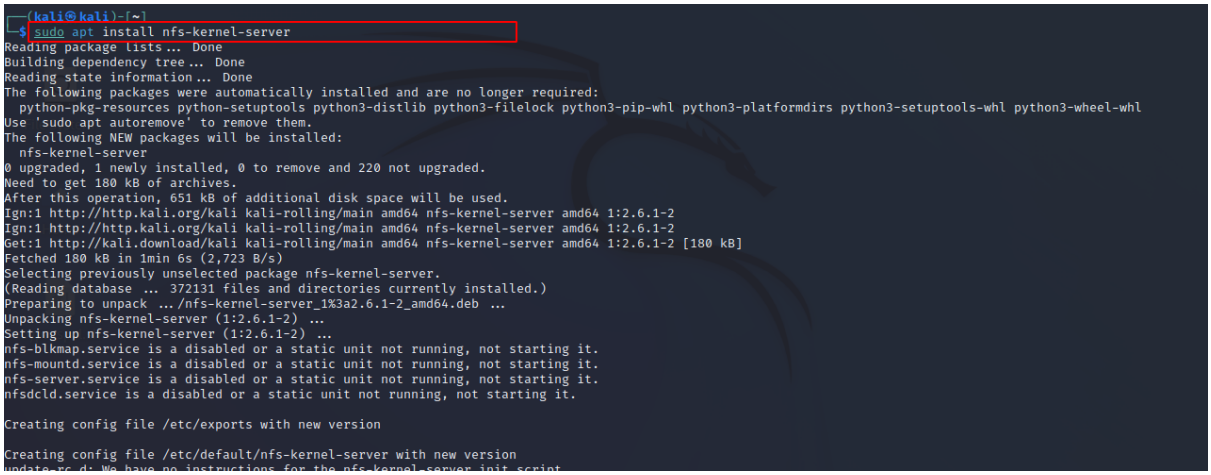


Creative file share service and configure NFS

NFS

- Install the nfs server

$ sudo apt install nfs-kernel-server



- Make a directory

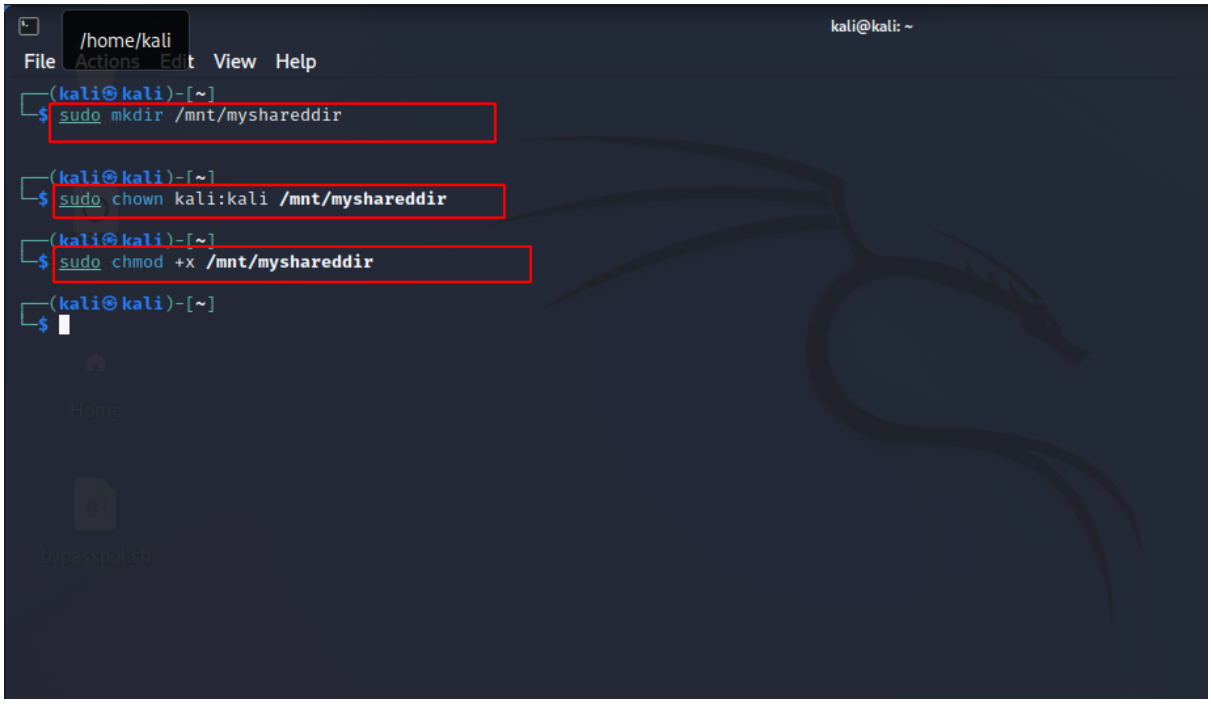
$ sudo mkdir /mnt/myshareddir

- Give owner permission

$ sudo chown kali:kali /mnt/myshareddir

- Give the permission to the directory

$ sudo chmod +x /mnt/myshareddir

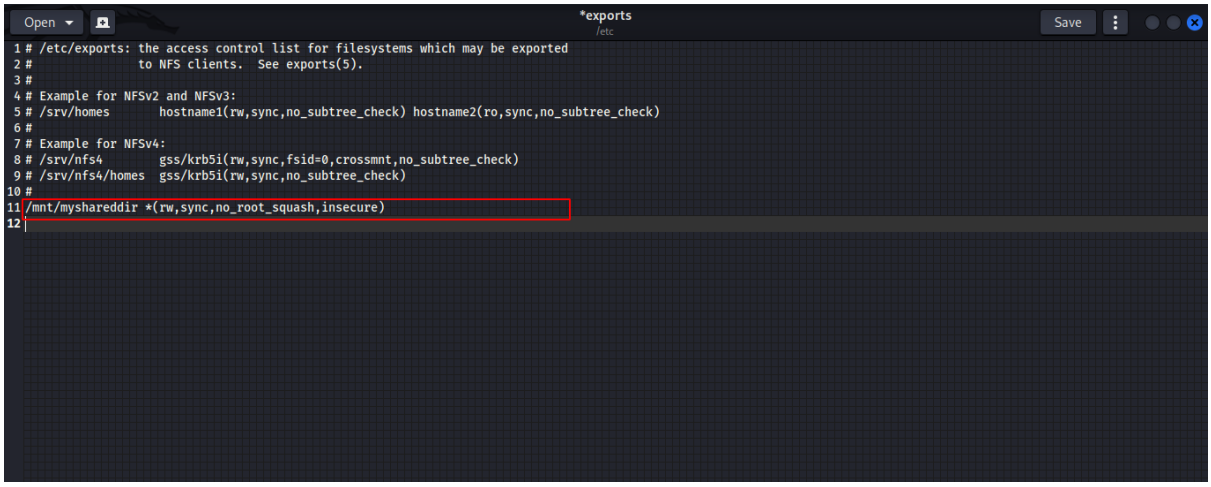


➢ Edit the exports file

$ sudo gedit /etc/exports

➢ Add the following line

/mnt/myshareddir *(rw,sync,no_root_squash,insecure)



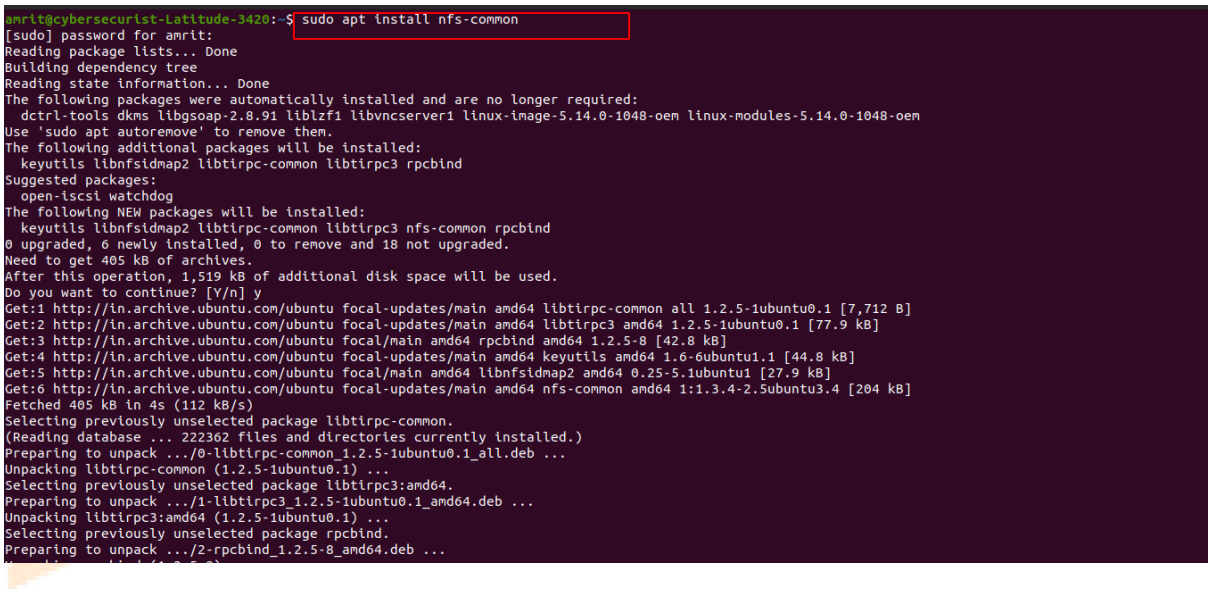
- Make the file share available

$ sudo exportfs –a

- Connect to the NFS server using the client machine

- Install the following package

$ sudo apt install nfs-common



- Create a local directory this will be the mount point for the NFS share.

$ sudo mkdir **/var/locally-mounted**

- Mount the file share by running the mount command.

$ sudo mount -t nfs 192.168.1.68:/mnt/myshareddir /var/locally-mounted/

```
amrit@cybersecurist-Latitude-3420:~$ sudo mkdir /var/locally-mounted
[sudo] password for amrit:
amrit@cybersecurist-Latitude-3420:~$ ifconfig
enp45s0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        ether 00:be:43:37:0c:ed  txqueuelen 1000  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 24996  bytes 2795427 (2.7 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 24996  bytes 2795427 (2.7 MB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

wlp44s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.1.80  netmask 255.255.255.0  broadcast 192.168.1.255
        inet6 fe80::3920:e25b:d5e2:ee47  prefixlen 64  scopeid 0x20<link>
        ether c8:94:02:dc:a7:0f  txqueuelen 1000  (Ethernet)
        RX packets 211218  bytes 196254514 (196.2 MB)
        RX errors 0  dropped 878  overruns 0  frame 0
        TX packets 110744  bytes 41539834 (41.5 MB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

amrit@cybersecurist-Latitude-3420:~$ sudo mount -t nfs 192.168.1.80:/mnt/myshareddir /var/locally-mounted/
mount.nfs: requested NFS version or transport protocol is not supported
amrit@cybersecurist-Latitude-3420:~$ sudo mount -t nfs 192.168.1.68:/mnt/myshareddir /var/locally-mounted/
mount.nfs: access denied by server while mounting 192.168.1.68:/mnt/myshareddir
amrit@cybersecurist-Latitude-3420:~$ sudo mount -t nfs 192.168.1.68:/mnt/myshareddir /var/locally-mounted/
amrit@cybersecurist-Latitude-3420:~$
```

- Folder will be mounted
- To check if it is mounted or not enter

$ df –h

```
amrit@cybersecurist-Latitude-3420: ~
amrit@cybersecurist-Latitude-3420:~$ df -h
Filesystem                      Size  Used Avail Use% Mounted on
udev                            7.7G     0  7.7G   0% /dev
tmpfs                           1.6G  2.2M  1.6G   1% /run
/dev/nvme0n1p2                  468G   92G  353G  21% /
tmpfs                           7.7G     0  7.7G   0% /dev/shm
tmpfs                           5.0M  4.0K  5.0M   1% /run/lock
tmpfs                           7.7G     0  7.7G   0% /sys/fs/cgroup
/dev/loop0                      128K  128K     0 100% /snap/bare/5
/dev/loop1                       56M   56M     0 100% /snap/core18/2128
/dev/loop2                       56M   56M     0 100% /snap/core18/2538
/dev/loop3                      219M  219M     0 100% /snap/gnome-3-34-1804/72
/dev/loop4                       62M   62M     0 100% /snap/core20/1611
/dev/loop6                       92M   92M     0 100% /snap/gtk-common-themes/1535
/dev/loop5                      219M  219M     0 100% /snap/gnome-3-34-1804/77
/dev/loop8                       51M   51M     0 100% /snap/snap-store/547
/dev/loop12                      66M   66M     0 100% /snap/gtk-common-themes/1515
/dev/loop9                       55M   55M     0 100% /snap/snap-store/558
/dev/loop7                       47M   47M     0 100% /snap/snapd/16292
/dev/loop10                     401M  401M     0 100% /snap/gnome-3-38-2004/112
/dev/loop11                     347M  347M     0 100% /snap/gnome-3-38-2004/115
/dev/nvme0n1p1                  511M  5.3M  506M   2% /boot/efi
tmpfs                           1.6G   72K  1.6G   1% /run/user/1001
192.168.1.68:/mnt/myshareddir    79G   19G   56G  25% /var/locally-mounted
amrit@cybersecurist-Latitude-3420:~$
```

- Now goto the newly created directory **/var/locally-mounted**

$ Cd /var/locally-mounted

- All the files and subdirectories will be listed there

```
amrit@cybersecurist-Latitude-3420:/$ cd var/locally-mounted/
amrit@cybersecurist-Latitude-3420:/var/locally-mounted$ ls
test1.txt
amrit@cybersecurist-Latitude-3420:/var/locally-mounted$ cat test1.txt
hello
amrit@cybersecurist-Latitude-3420:/var/locally-mounted$
```

Create SMB service and configure it

What is SMB

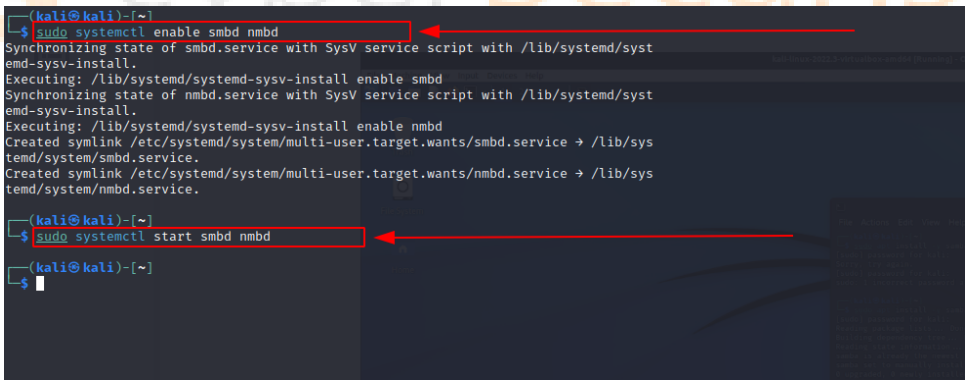
The SMB (Server Message Block) protocol provides for "client-server communication," which allows programs and services on networked computers to communicate with one another. File, print, and device sharing are just a few of the network functions enabled by SMB.

- Install Samba in your os

  $ sudo apt install –y samba
- Eanable "**smbd" & "nmbd"**

  $ sudo systemctl enable ambd nmbd
- Start "**smbd" & "nmbd"**

  $ sudo systemctl start ambd nmbd

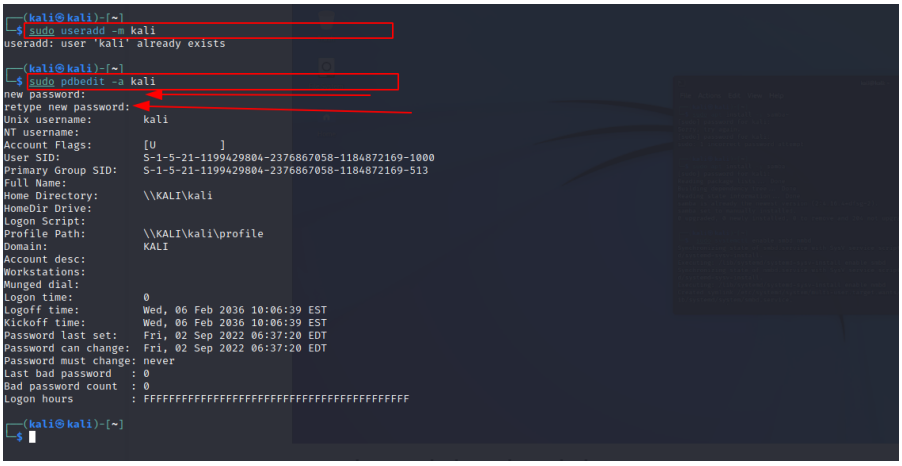


Add user access to samba with pdbedit. This user must be exists in Linux. If user to be added by pdbedit does not exist, you need to add user with useradd.

$ sudo useradd –m kali

Set your user password

$ sudo pdbedit –a kali



- Edit the configuration file

sudo gedit /etc/samba/smb.conf

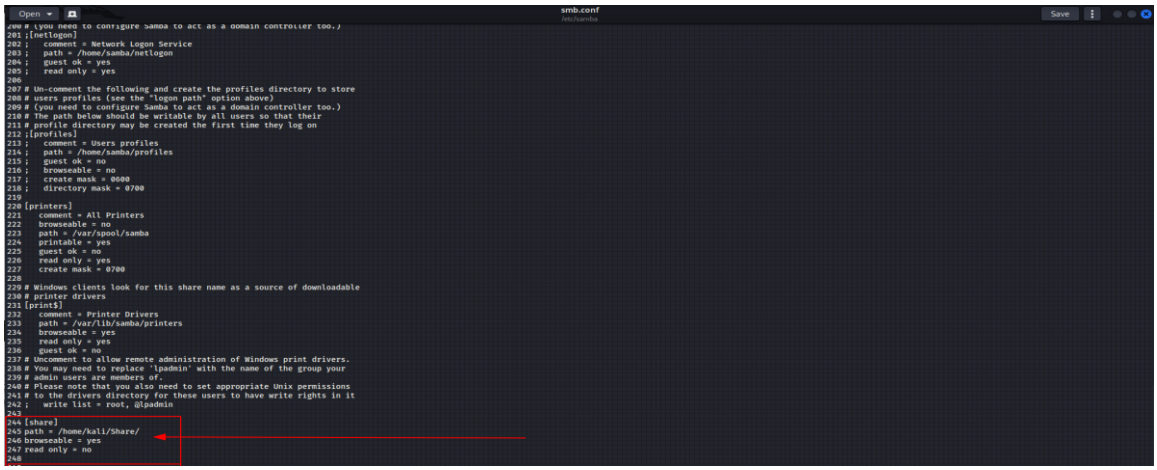
- Add the following code at the bottom

[share]

path = /home/kali/Share/

browseable = yes

read only = no



Save it and exit

- Goto the home directory and **create a folder Share**
- Give permission to it

$ chmod +x Share

- Restart the smb service

$sudo service smbd start

$sudo service nmbd start

- Set the smb password

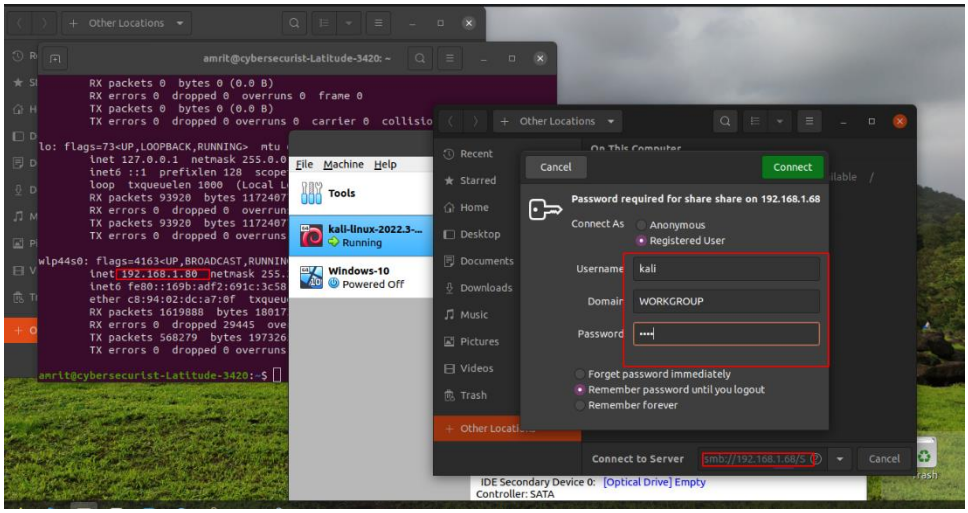
$ sudo smbpasswd -a kali

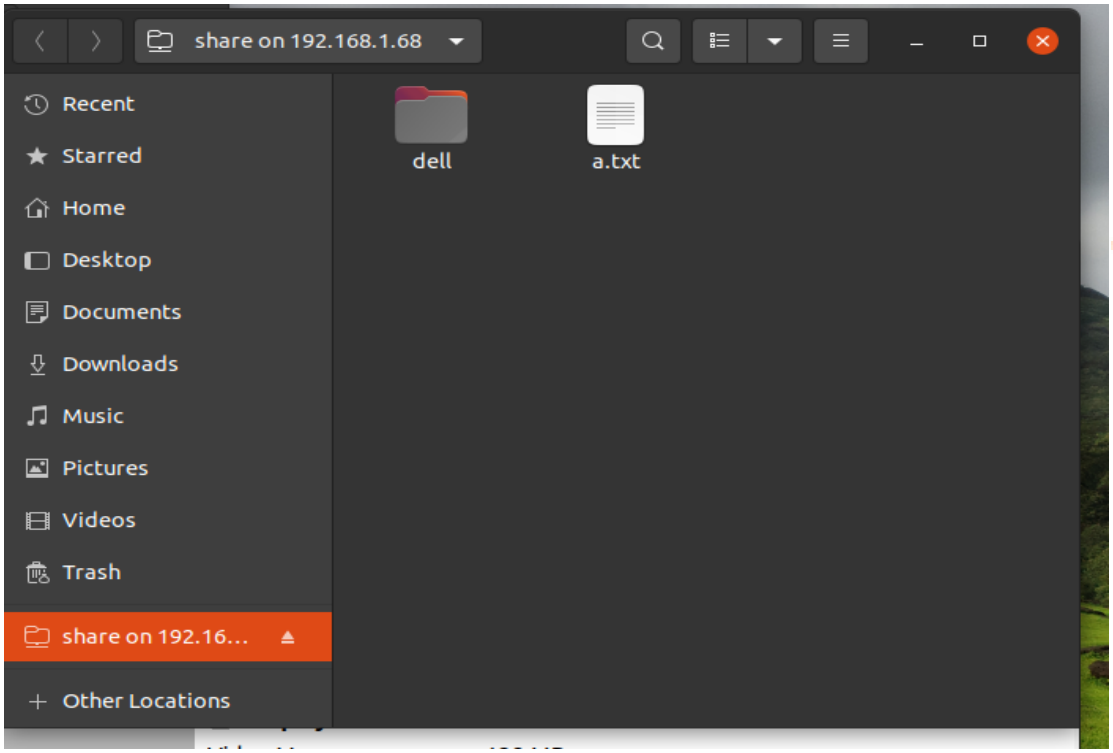
- Connect to it using windows or linux machine

Smb://<$ip>/<file name>

For linux goto the file **Explorer below > Other Locations**

Below there is a bar where it says **connect to the server**


Other Locations
amrit@cybersecurist-Latitude-3420: ~
RX packets 0 bytes 0 (0.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 0 bytes 0 (0.0 B)
TX errors 0 dropped 0 overruns 0 carrier 0 collisio
lo: flags=73<UP,LOOPBACK,RUNNING> mtu
inet 127.0.0.1 netmask 255.0.0
inet6 ::1 prefixlen 128 scope
loop txqueuelen 1000 (Local L
RX packets 93920 bytes 1172407
RX errors 0 dropped 0 overrun
TX packets 93920 bytes 1172407
TX errors 0 dropped 0 overruns
wlp44s0: flags=4163<UP,BROADCAST,RUNNIN
inet 192.168.1.80 netmask 255.
inet6 fe80::169b:adf2:691c:3c58
ether c8:94:02:dc:a7:0f txqueu
RX packets 1619888 bytes 18017
RX errors 0 dropped 29445 ove
TX packets 568279 bytes 197326
TX errors 0 dropped 0 overruns
amrit@cybersecurist-Latitude-3420:~$
File Machine Help
Tools
kali-linux-2022.3-...
Running
Windows-10
Powered Off
Other Locations
Recent
Starred
Home
Desktop
Documents
Downloads
Music
Pictures
Videos
Trash
Cancel
Connect
Password required for share share on 192.168.1.68
Connect As
Anonymous
Registered User
Username
kali
Domain
WORKGROUP
Password
Forget password immediately
Remember password until you logout
Remember forever
Connect to Server
smb://192.168.1.68/S
Cancel
IDE Secondary Device 0: [Optical Drive] Empty
Controller: SATA


share on 192.168.1.68
Recent
Starred
Home
Desktop
Documents
Downloads
Music
Pictures
Videos
Trash
share on 192.16...
Other Locations
dell
a.txt