

SACRED HEART COLLEGE

THEVARA



SERVER OPERATING SYSTEM
19U5VCBCA04

**BCA (Mobile Applications and Cloud
Technology)**

PRACTICAL RECORD

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Certificate

*This is to certify that it is a bonafied record of practical work done by Sri **Biraj Magar** bearing the Roll No. **22UBCA7356** of 5th Semester BCA(Mobile Applications and Cloud Technology) in the Server Operating System laboratory during the academic under our supervisor.*

Signature of Internal Examiner

Signature of External Examiner

Date: 11/09/2024

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SAMBA SHARE

Experiment: 1

Aim: Installation and configuration of Samba share.

Description:

SAMBA

One of the most common ways to network Ubuntu and Windows computers is to configure Samba as a File Server. This section covers setting up a Samba server to share files with Windows clients.

The server will be configured to share files with any client on the network without prompting for a password. If your environment requires stricter Access Controls see [Share Access Control](#)

Port No: 139

Package name: samba

Configuration file: /etc/samba/smb.conf.

Procedure:

1. To install Samba, we can run:

```
$sudo apt update  
$sudo apt install samba
```

2. We can check if the installation was successful by running:

```
$whereis samba
```

3. Now that Samba is installed, we need to create a directory for it to share:

```
$mkdir /home/<username>/sambashare/
```

The command above creates a new folder samba share in our home directory which we will share later. The configuration file for Samba is located at /etc/samba/smb.conf. To add the new directory as a share, we edit the file by running:

```
$sudo nano /etc/samba/smb.conf
```

At the bottom of the file, add the following lines:

```
[sambashare]  
comment = Samba on Ubuntu  
path = /home/username/sambashare  
read only = no  
browsable = yes
```

4. Then press Ctrl-O to save and Ctrl-X to exit from the nano text editor.

5. Now that we have our new share configured, save it and restart Samba for it to take effect:

```
$sudo service smbd restart
```

6. Update the firewall rules to allow Samba traffic:

```
$sudo ufw allow samba
```

SETTING UP USER ACCOUNTS AND CONNECTING TO SHARE

7. Since Samba doesn't use the system account password, we need to set up a Samba password for our user account:

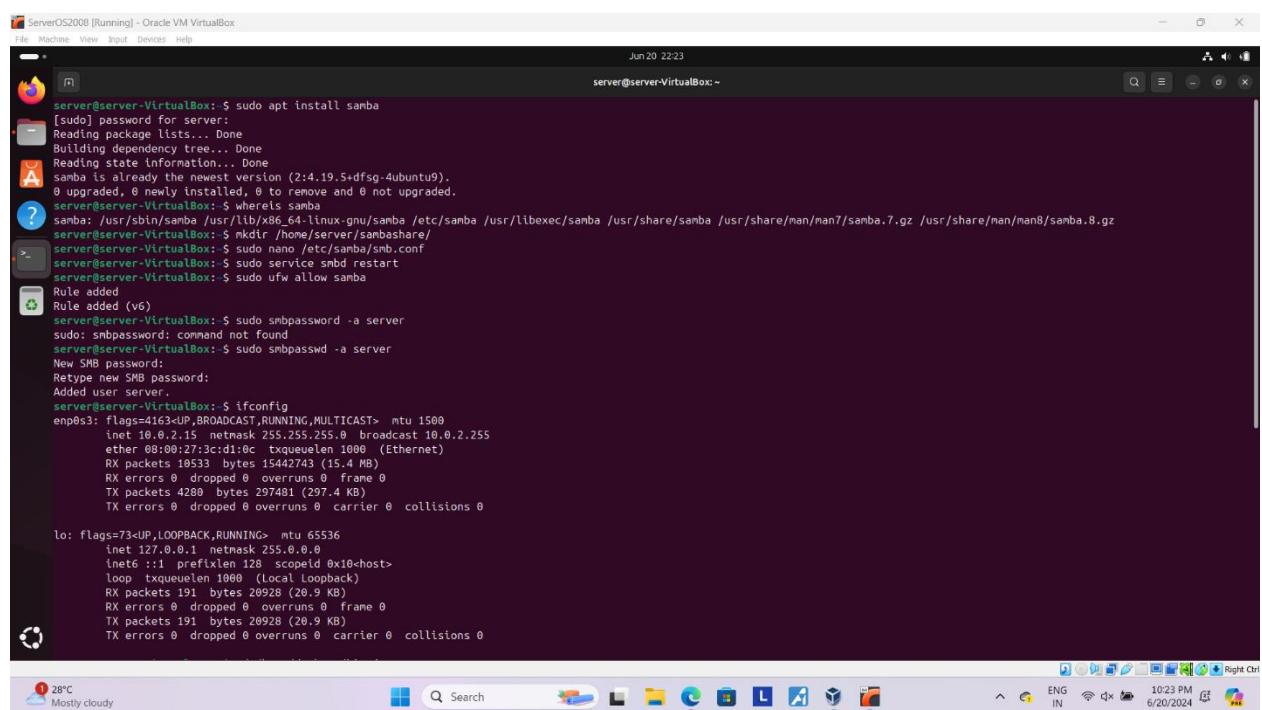
```
$ sudo smbpasswd -a username
```

CONNECTING TO SHARE

8. On Ubuntu: Open up the default file manager and click Connect to Server then enter: Connecting to samba via smb://127.0.0.1/sambashare

Note: ip-address is the Samba server IP address and sambashare is the name of the share. You'll be prompted for your credentials. Enter them to connect

Result:



The screenshot shows a terminal window titled "ServerOS2008 [Running] - Oracle VM VirtualBox". The terminal session starts with:

```
server@server-VirtualBox:~$ sudo apt install samba
[sudo] password for server:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
A samba is already the newest version (2:4.19.5+dfsg-4ubuntu9).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
server@server-VirtualBox:~$ whereis samba
samba: /usr/sbin/samba /usr/lib/x86_64-linux-gnu/samba /etc/samba /usr/libexec/samba /usr/share/samba /usr/share/man/man7/samba.7.gz /usr/share/man/man8/samba.8.gz
server@server-VirtualBox:~$ mkdir /home/server/sambashare/
server@server-VirtualBox:~$ sudo nano /etc/samba/smb.conf
server@server-VirtualBox:~$ sudo service smbd restart
server@server-VirtualBox:~$ sudo ufw allow samba
Rule added
Rule added (v6)
server@server-VirtualBox:~$ sudo smbpassword -a server
sudo: smbpassword: command not found
server@server-VirtualBox:~$ sudo smbpasswd -a server
New SMB password:
Retype new SMB password:
Added user server
server@server-VirtualBox:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
          ether 08:08:27:3c:d1:0e  txqueuelen 1000  (Ethernet)
        RX packets 10533  bytes 15442743 (15.4 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 4288  bytes 297481 (297.4 KB)
        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
          loop  txqueuelen 1000  (Local Loopback)
        RX packets 191  bytes 20928 (26.9 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 191  bytes 20928 (26.9 KB)
        TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0
```

The terminal window is part of a desktop environment, with a taskbar at the bottom showing icons for various applications like File Explorer, Task View, and Control Panel.

ServerOS2008 [Running] - Oracle VM VirtualBox

File Machine View Input Device Help Jun 20 21:41

server@server-VirtualBox:~ /etc/samba/smb.conf

```

# # This is the main Samba configuration file. You should read the
# # smb.conf(5) manual page in order to understand the options listed
# # here. Samba has a huge number of configurable options most of which
# # are not shown in this example
#
# # Some options that are often worth tuning have been included as
# # commented-out examples in this file.
# # When such options are commented with ";", the proposed setting
# # differs from the default Samba behaviour
# # . When commented with "#", the proposed setting is the default
# # behaviour of Samba but the option is considered important
# # enough to be mentioned here
#
# NOTE: Whenever you modify this file you should run the command
# "testparm" to check that you have not made any basic syntactic
# errors.

#===== Global Settings =====

[global]

## Browsing/Identification ##

# Change this to the workgroup/NT-domain name your Samba server will part of
workgroup = WORKGROUP

# server string is the equivalent of the NT Description field
server string = %h server (Samba, Ubuntu)

#### Networking ####


```

Help Exit Write Out Read File Where Is Cut Paste Execute Justify Location Undo Set Mark To Bracket Previous Back Read 242 lines Go To Line Redo Copy Where Was Next Forward

28°C Mostly cloudy Search ENG IN 9:41 PM 6/20/2024 Right Ctrl

ServerOS2008 [Running] - Oracle VM VirtualBox

File Machine View Input Device Help Jun 20 21:59

server@server-VirtualBox:~

Files + Other Locations

On This Device

Ubuntu 10.6 GB /21.5 GB available /

Networks

SERVER-VIRTUALBOX

smb://127.0.0.1/ Connect

```

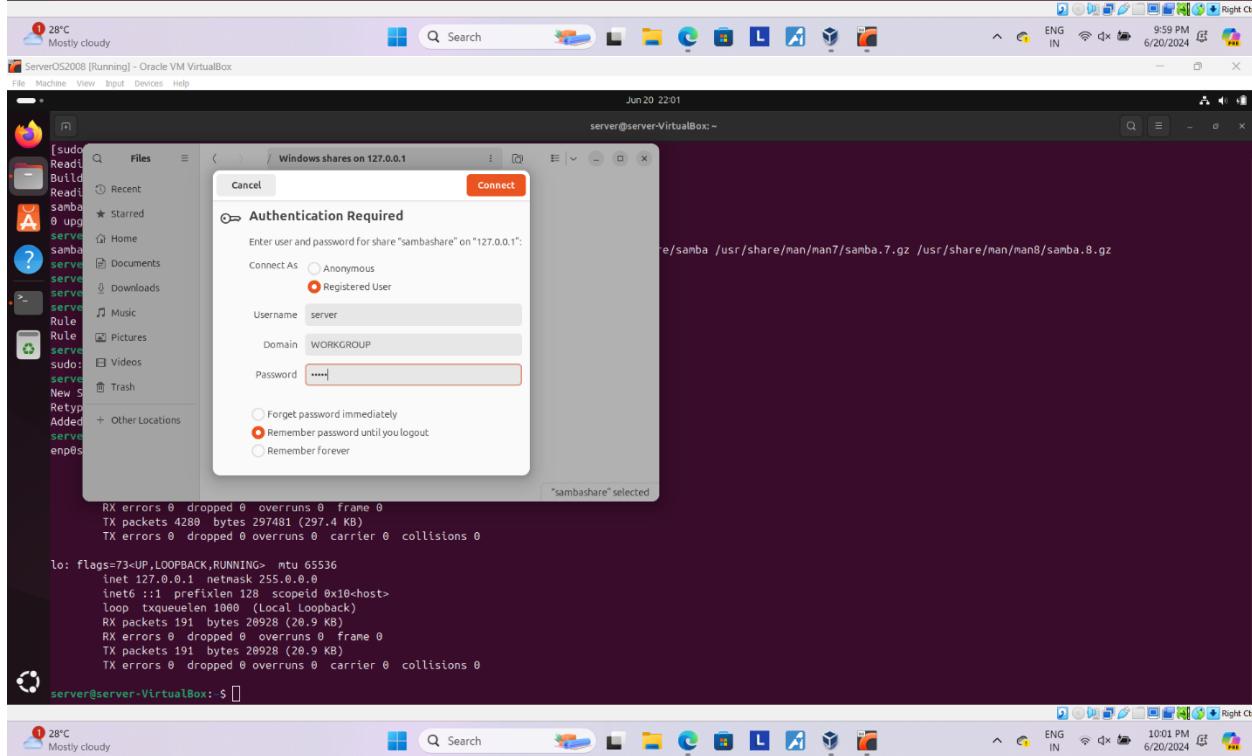
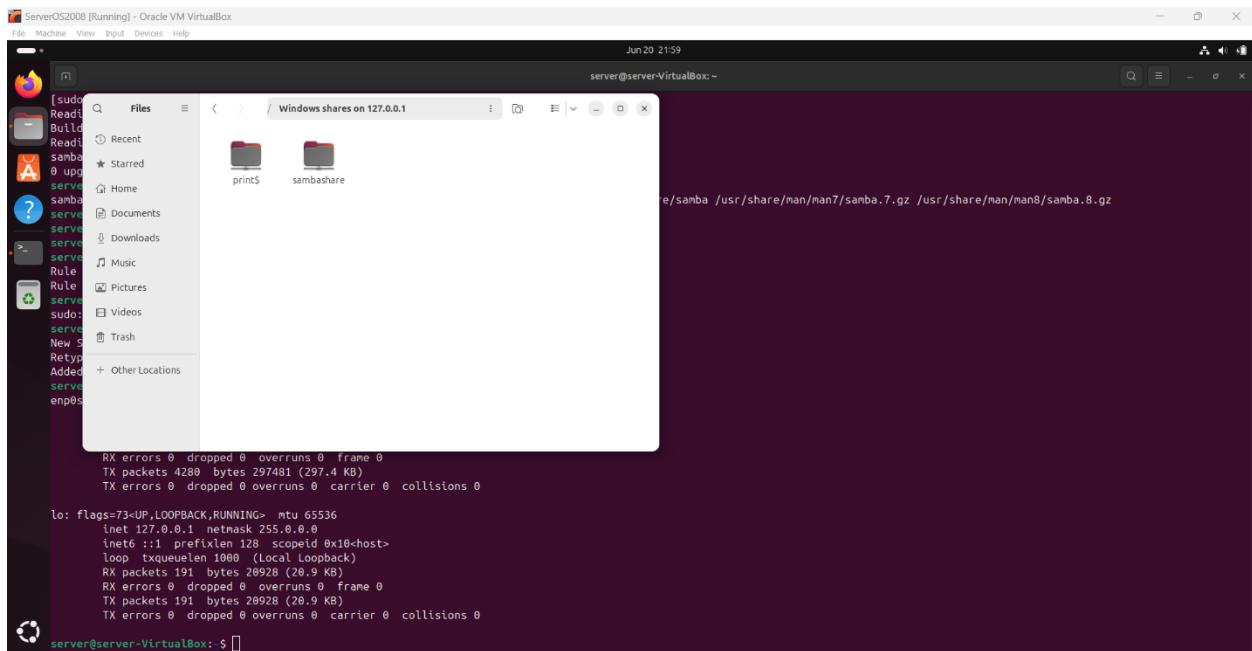
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 4280 bytes 297481 (297.4 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

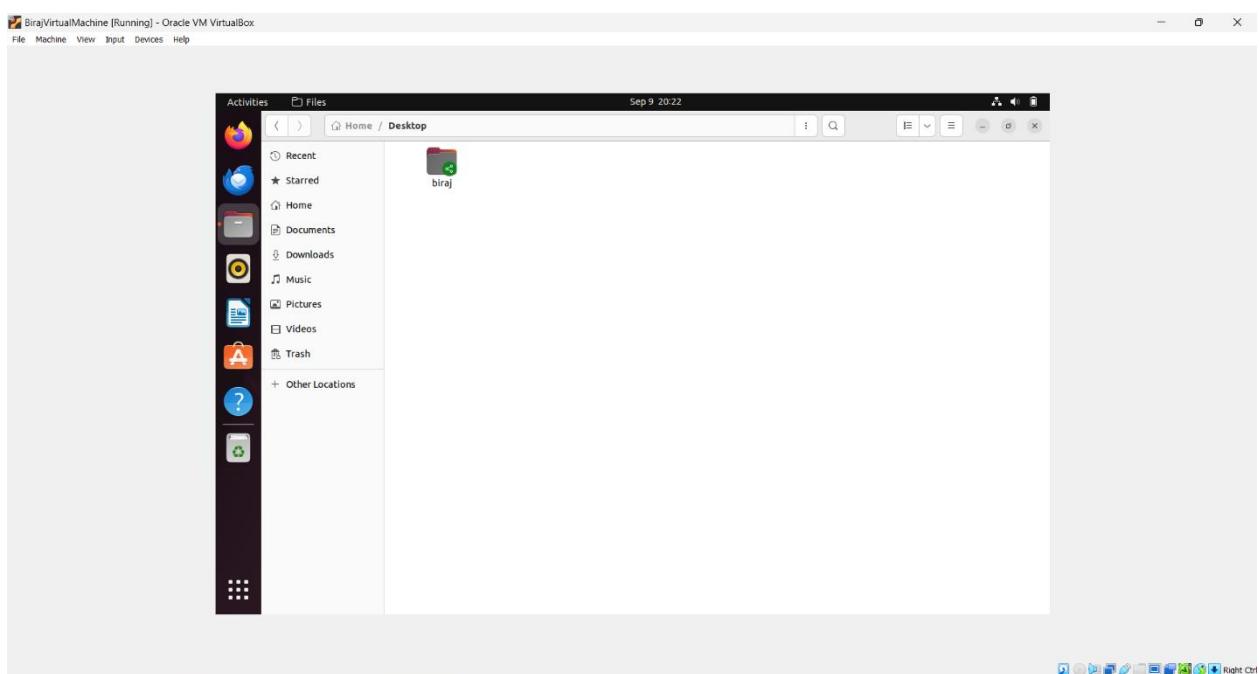
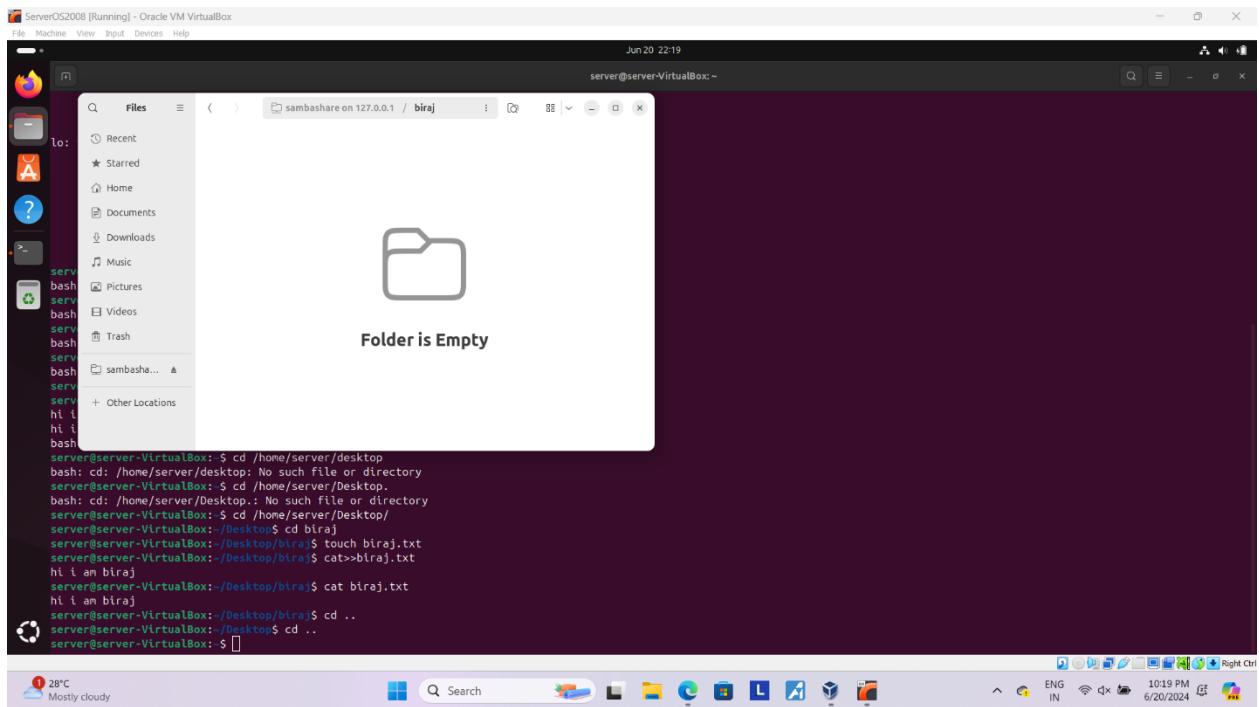
lo: flags=73<UP,LOOPBACK,RUNNING mtu 65536
inet 127.0.0.1 netmask 255.0.0.0
inet6 ::1 prefixlen 128 scopid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 191 bytes 20928 (20.9 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 191 bytes 20928 (20.9 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

```

server@server-VirtualBox:~

28°C Mostly cloudy Search ENG IN 9:59 PM 6/20/2024 Right Ctrl





All the commands have been executed and the output has been obtained successfully.

DNS

Experiment: 2

Aim: To create and configure DNS Server

Description:

DNS Server

A DNS server is a computer server that contains a database of public IP addresses and their associated hostnames, and in most cases, serves to resolve, or translate, those common names to IP addresses as requested.

Port No: 53

Package name: bind9

Configuration file: /etc/bind/named.conf. (Primary configuration file),/etc/bind/db.root
(root nameservers)

Procedure:

CASHING NAMESERVER

When configured as a caching nameserver BIND9 will find the answer to name queries and remember the answer when the domain is queried again.

1. Install bind9 by typing

```
$sudo apt install bind9  
$sudo apt install dnsutils
```

2.The default configuration is set up to act as a caching server. All that is required is simply adding the IP Addresses of your ISP's DNS servers. Simply uncomment and edit the following in /etc/bind/named.conf.options:

3.Restart it by typing

```
$sudo systemctl restart bind9.service
```

PRIMARY MASTER

As a primary master server BIND9 reads the data for a zone from a file on its host and is authoritative for that zone.

Forward zone file

To add a DNS zone to BIND9, turning BIND9 into a Primary Master server, the first step is to edit /etc/bind/named.conf.local:

```
$sudo cp /etc/bind/db.local /etc/bind/db.example.com  
$sudo systemctl restart bind9.service
```

Reverse Zone File

Now that the zone is set up and resolving names to IP Addresses, a *Reverse zone* needs to be added to allow DNS to resolve an address to a name.

1. Edit /etc/bind/named.conf.local

2. Now create the /etc/bind/db.192 file:

```
$sudo cp /etc/bind/db.127 /etc/bind/db.192
```

3. edit /etc/bind/db.192 changing the basically the same options as /etc/bind/db.example.com:

4. After creating the reverse zone file restart BIND9:

```
$sudo systemctl restart bind9.service
```

5. Check the status

```
$Sudo service bind9 status
```

6. Check if nslookup can resolve

```
$nslookup ftp.example.com  
$nslookup ubuntu.example.com
```

7. Gather information about your DNS server

```
$dig ubuntu.example.com
```

```
$dig www.example.com
```

```
$dig ftp.example.com
```

Result:

```
kali@kali:~$ sudo apt install bind9
bind9 is already the newest version (3:9.20.1-1).
The following packages were automatically installed and are no longer required:
libavfilter libgeos3.12.1t64 libjxl8.7 libplacebo338 libpostproc57 libre2-10 libsvtavenc1d1 libx265-199 openjdk-17-jre-headless python3-mistune0 python3-pytzdata rwhod samba-dsdb-modules
libdactl1 libjsncp25 libndctl6 libpmem1 libravie0 librsvg0.3 libu2f-udev openjdk-17-jre python3-diskcache python3-pendulum rwho samba-ad-provision
Use 'sudo apt autoremove' to remove them.

Summary: Upgrading: 0, Installing: 0, Removing: 0, Not Upgrading: 3
kali@kali:~$ ls -al /etc/nanl
total 0
kali@kali:~$ ls -al /etc/resolv.conf
total 0
kali@kali:~$ cat /etc/resolv.conf
# Generated by NetworkManager
search local
nameserver 192.168.1.1
kali@kali:~$ nano /etc/resolv.conf
[REDACTED]
kali@kali:~$ cat /etc/resolv.conf
# Generated by NetworkManager
search local
nameserver 192.168.1.1
kali@kali:~$ nano /etc/bind/named.conf.options
[REDACTED]
kali@kali:~$ nano /etc/bind/named.conf.local
[REDACTED]
```

dssfd

```
kali@kali:~$ cat /etc/bind/named.conf.options
// If there is a firewall between you and nameservers you want
// to talk to, you may need to tell the firewall to allow multiple
// ports to talk. See http://www.ik.org/ucls/10/80013
//
// If your ISP provided one or more IP addresses for stable
// nameservers, you probably want to use them as forwarders.
// Uncomment the following block, and insert the addresses replacing
// the all-0's placeholder.
forwarders {
    10.0.2.15;
};

// If BIND logs error messages about the root key being expired,
// you will need to update your keys. See https://www.isc.org/bind-keys
dnssec-validation auto;

listen-on-v6 { any; };
```

```

kali@kali:~$ sudo nano /etc/bind/named.conf.local
;
; BIND data file for local loopback interface
;
$TTL    604800
@       IN      SOA     biraj.com. root.biraj.com. (
                            2 ; Serial
                            0 ; Refresh
                            86400 ; Retry
                            2419200 ; Expire
                            604800 ) ; Negative Cache TTL
;
@       IN      NS      biraj.com.
@       IN      A       10.0.2.56
@       IN      AAAA   ::1

kali@kali:~$ nslookup biraj.com
Server:  10.0.2.15
Address: 10.0.2.15#53

Name:  Biraj.com
Address: 10.0.2.33
Name:  Biraj.com
Address: ::1

kali@kali:~$ sudo nano /etc/bind/named.conf.local
(kali㉿kali)-[~] $ sudo systemctl restart named
(kali㉿kali)-[~] $ nslookup biraj.com
;; Got SERVFAIL reply from 10.0.2.15
Server:  10.0.2.15
Address: 10.0.2.15#53

** server can't find biraj.com: SERVFAIL

(kali㉿kali)-[~] $ sudo nano /etc/bind/biraj.com
(kali㉿kali)-[~] $ sudo nano /etc/bind/named.conf.local
(kali㉿kali)-[~] $ sudo cp /etc/bind/biraj.com /etc/bind/db.biraj.com
(kali㉿kali)-[~] $ sudo systemctl restart named
(kali㉿kali)-[~] $ nslookup biraj.com
Server:  10.0.2.15
Address: 10.0.2.15#53

Name:  biraj.com
Address: 10.0.2.56
Name:  biraj.com
Address: ::1

(kali㉿kali)-[~] $ sudo nano /etc/bind/named.conf.local

```

```

kali-linux-2024.2-virtualbox-amd64 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
File Actions Edit View Help
GNU nano 8.1
; BIND data file for local loopback interface
$TTL 604800
@ IN SOA biraj.com. root.biraj.com. (
        2 ; Serial
        604800 ; Refresh
        86400 ; Retry
        2419200 ; Expire
        604800 ) ; Negative Cache TTL
;
@ IN NS biraj.com.
@ IN A 10.0.2.56
@ IN AAAA ::1

kali@kali: ~

```

Help Exit Write Out Read File Where Is Replace Cut Paste Execute Justify Location Go To Line Read 14 Lines Undo Redo Set Mark To Bracket Where Was Previous Back Forward Prev Word Next Word Home End

```

kali-linux-2024.2-virtualbox-amd64 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
File Actions Edit View Help
Address: ::1

(kali㉿kali)-[~]
└─$ sudo nano /etc/bind/named.conf.local
(kali㉿kali)-[~]
└─$ sudo systemctl restart named
(kali㉿kali)-[~]
└─$ nslookup biraj.com
;; Got SERVFAIL reply from 10.0.2.15
Server:      10.0.2.15
Address:    10.0.2.15#53
Address:    ::1

** server can't find biraj.com: SERVFAIL

(kali㉿kali)-[~]
└─$ sudo nano /etc/bind/biraj.com
(kali㉿kali)-[~]
└─$ sudo nano /etc/bind/named.conf.local
(kali㉿kali)-[~]
└─$ sudo cp /etc/bind/biraj.com /etc/bind/db.biraj.com
(kali㉿kali)-[~]
└─$ sudo systemctl restart named
(kali㉿kali)-[~]
└─$ nslookup biraj.com
Server:      10.0.2.15
Address:    10.0.2.15#53
Name:    biraj.com
Address: 10.0.2.56
Name:    biraj.com
Address: ::1

(kali㉿kali)-[~]
└─$ sudo nano /etc/bind/named.conf.local
(kali㉿kali)-[~]
└─$ sudo nano /etc/bind/db.biraj.com
(kali㉿kali)-[~]
└─$ sudo cp /etc/bind/db.127 /etc/bind/db.56.2.0.10
(kali㉿kali)-[~]
└─$ 

```

Help Exit Write Out Read File Where Is Replace Cut Paste Execute Justify Location Go To Line Read 11 Lines Undo Redo Set Mark To Bracket Where Was Previous Back Forward Prev Word Next Word Home End

```

kali-linux-2024.2-virtualbox-amd64 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
File Actions Edit View Help
GNU nano 8.1
; BIND reverse data file for local loopback interface
$TTL 604800
@ IN SOA 56.2.0.10. root.56.2.0.10. (
        2 ; Serial
        604800 ; Refresh
        86400 ; Retry
        2419200 ; Expire
        604800 ) ; Negative Cache TTL
;
@ IN NS 56.2.0.10.
@ IN PTR biraj.com.


```

Help Exit Write Out Read File Where Is Replace Cut Paste Execute Justify Location Go To Line Read 11 Lines Undo Redo Set Mark To Bracket Where Was Previous Back Forward Prev Word Next Word Home End

The screenshot shows a terminal window titled "kali-linux-2024.2-virtualbox-amd64 [Running] - Oracle VM VirtualBox". The command being run is "sudo nano /etc/bind/named.conf.local". The content of the file is as follows:

```
GNU nano 8.1
// Do any local configuration here
//
// Consider adding the 1918 zones here, if they are not used in your
// organization
//include '/etc/bind/zones.rfc1918';
//forwarders {
//zone 'biraj.com' IN{
    type master;
    file '/etc/bind/db.biraj.com';
};

//reverse zone
zone '56.2.0.15.in-addr.arpa' IN{
    type master;
    file '/etc/bind/db.56.2.0.15';
};
```

The screenshot shows a terminal window titled "kali-linux-2024.2-virtualbox-amd64 [Running] - Oracle VM VirtualBox". The session starts with the user navigating to the /etc/bind directory and copying the biraj.com configuration file to named.conf.local. Then, the user runs systemctl to restart the named service. Finally, the user checks the status of the named service and lists all running processes.

```
(kali㉿kali)-[~]
$ sudo cp /etc/bind/biraj.com /etc/bind/named.conf.local
(kali㉿kali)-[~]
$ sudo systemctl restart named
(kali㉿kali)-[~]
$ netcat -l -p 53
Server: 10.0.2.15
Address: 10.0.2.15#53
Name: biraj.com
Address: ::1

(kali㉿kali)-[~]
$ sudo nano /etc/bind/named.conf.local
(kali㉿kali)-[~]
$ sudo nano /etc/bind/db.biraj.com
(kali㉿kali)-[~]
$ sudo cp /etc/bind/db.127 /etc/bind/db.56.2.0.10
(kali㉿kali)-[~]
$ sudo nano /etc/bind/named.conf.local
(kali㉿kali)-[~]
$ sudo systemctl restart named
(kali㉿kali)-[~]
$ ps -aux | grep 56.2.0.15.in-addr.arpa name = biraj.com.

(kali㉿kali)-[~]
```

All the commands have been executed and the output has been obtained successfully.

FTP

Experiment : 3

Aim : To create and configure FTP Server

Description :

FTP Server

File Transfer Protocol (FTP) is a TCP protocol for downloading files between computers. In the past, it has also been used for uploading but, as that method does not use encryption, user credentials as well as data transferred in the clear and are easily intercepted. So if you are here looking for a way to upload and download files securely,

FTP works on a client/server model. The server component is called an *FTP daemon*. It continuously listens for FTP requests from remote clients. When a request is received, it manages the login and sets up the connection. For the duration of the session it executes any of commands sent by the FTP client

Port No: 21

Package name: vsftpd

Configuration file: /etc/vsftpd.conf

Procedure:

1. Install the vsftpd - FTP Server Installation in the ubuntu operating system

\$sudo apt install vsftpd

2. By default vsftpd is *not* configured to allow anonymous download. If you wish to enable anonymous download edit /etc/vsftpd.conf by changing:

\$anonymous_enable=YES

3. During installation a *ftp* user is created with a home directory of /srv/ftp. This is the default FTP directory.

If you wish to change this location, to /srv/files/ftp for example, simply create a directory in another location and change the *ftp* user's home directory:

\$sudo mkdir -p /srv/files/ftp

\$sudo usermod -d /srv/files/ftp ftp

4. After making the change restart vsftpd:

\$ sudo service vsftpd restart

5. User Authenticated FTP Configuration

By default vsftpd is configured to authenticate system users and allow them to download files. If you want users to be able to upload files, edit /etc/vsftpd.conf

```
$write_enable=YES
```

6. Now restart vsftpd:

```
$ sudo service vsftpd restart
```

7. Securing FTP

There are options in /etc/vsftpd.conf to help make vsftpd more secure.

```
$chroot_local_user=YES
```

```
$chroot_list_enable=YES
```

```
$chroot_list_file=/etc/vsftpd.chroot_list
```

8. After uncommenting the above options, create a /etc/vsftpd.chroot_list

containing a list of users one per line.

9. Then restart vsftpd:

```
$sudo service vsftpd restart
```

10. To configure *FTPS*, edit /etc/vsftpd.conf and at the bottom add:

```
$ssl_enable=YES
```

11. Then check the vsftpd status

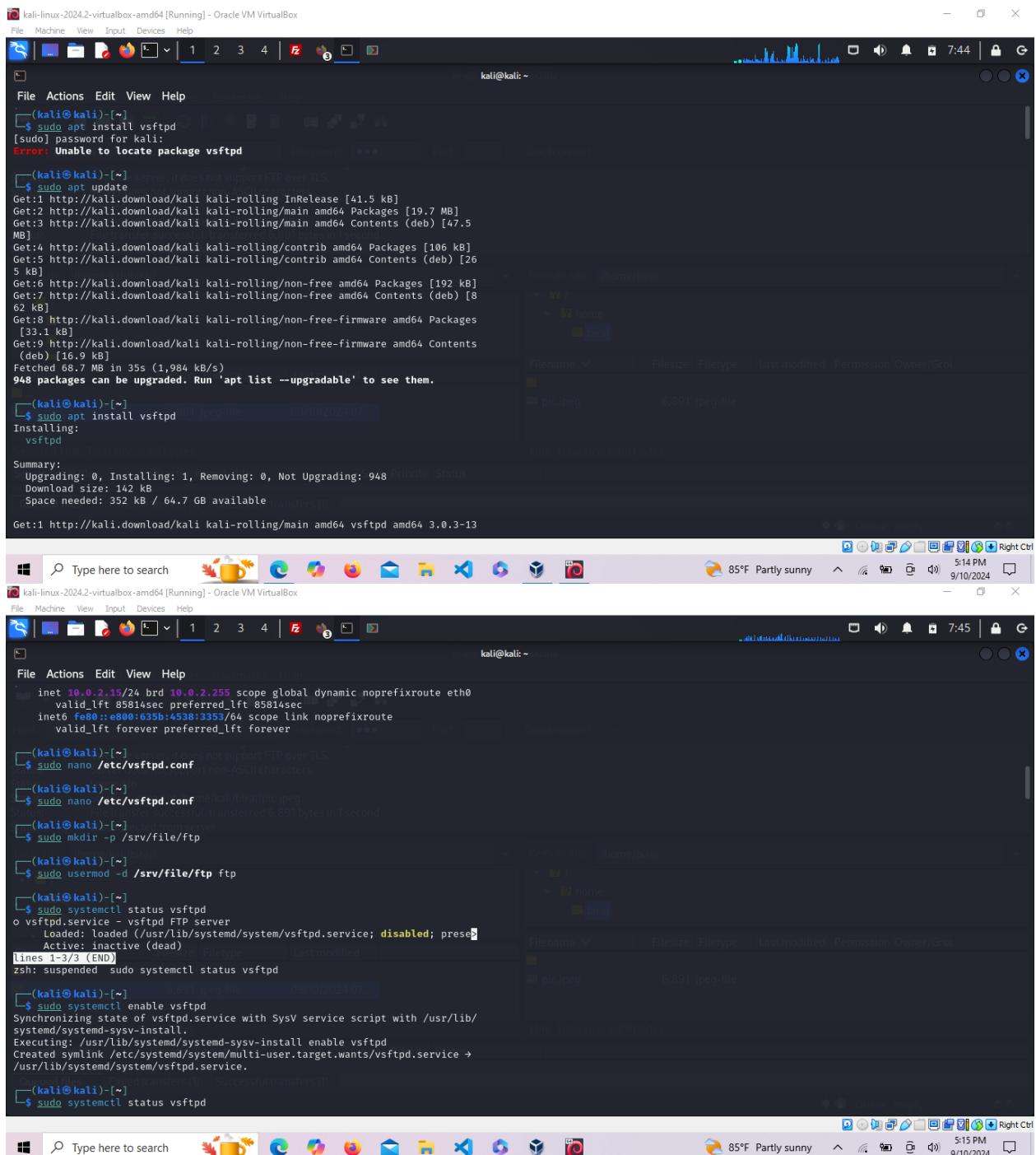
```
$sudo service vsftpd status
```

12. Now connect to ftp by the command

```
$ftp -p 192.168.234.128
```

13. Now install filezilla in ubuntu and open the filezilla and specify the ip address and port number of the ftp server then click connect

Result:



The screenshot shows a Kali Linux terminal window with two sessions. The top session is for installing vsftpd, and the bottom session is for configuring it.

Session 1 (Top):

```
(kali㉿kali)-[~]
└─$ sudo apt install vsftpd
[sudo] password for kali:
Error: Unable to locate package vsftpd
```

Get:1 http://kali.download/kali kali-rolling InRelease [41.5 kB]
Get:2 http://kali.download/kali kali-rolling/main amd64 Packages [19.7 MB]
Get:3 http://kali.download/kali kali-rolling/main amd64 Contents (deb) [47.5 kB]
Get:4 http://kali.download/kali kali-rolling/contrib amd64 Packages [106 kB]
Get:5 http://kali.download/kali kali-rolling/contrib amd64 Contents (deb) [26.5 kB]
Get:6 http://kali.download/kali kali-rolling/non-free amd64 Packages [192 kB]
Get:7 http://kali.download/kali kali-rolling/non-free amd64 Contents (deb) [8.62 kB]
Get:8 http://kali.download/kali kali-rolling/non-free-firmware amd64 Packages [33.1 kB]
Get:9 http://kali.download/kali kali-rolling/non-free-firmware amd64 Contents (deb) [16.9 kB]
Fetched 68.7 MB in 35s (1,984 kB/s)
948 packages can be upgraded. Run 'apt list --upgradable' to see them.

(kali㉿kali)-[~]
└─\$ sudo apt update
[...]

Session 2 (Bottom):

```
(kali㉿kali)-[~]
└─$ sudo apt install vsftpd
[...]
Installing:
  vsftpd
```

Summary:

```
Upgrading: 0, Installing: 1, Removing: 0, Not Upgrading: 948 Priority: Status
Download size: 142 kB
Space needed: 352 kB / 64.7 GB available
```

```
Get:1 http://kali.download/kali kali-rolling/main amd64 vsftpd amd64 3.0.3-13
```

```
(kali㉿kali)-[~]
└─$ sudo nano /etc/vsftpd.conf
[...]
```

```
(kali㉿kali)-[~]
└─$ sudo nano /etc/vsftpd.conf <--kali@kali/pic.jpeg
[...]
File transferred 6,891 bytes in 1 second
```

```
(kali㉿kali)-[~]
└─$ sudo mkdir -p /srv/file/ftp
[...]
```

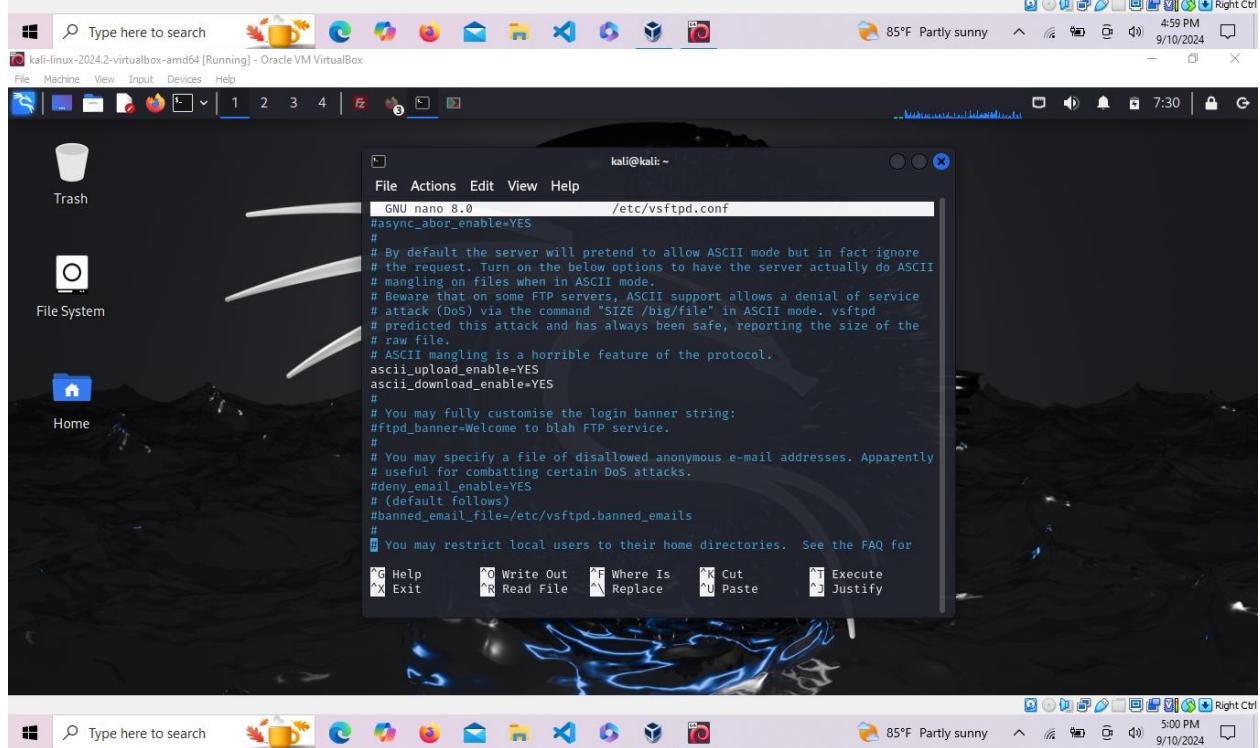
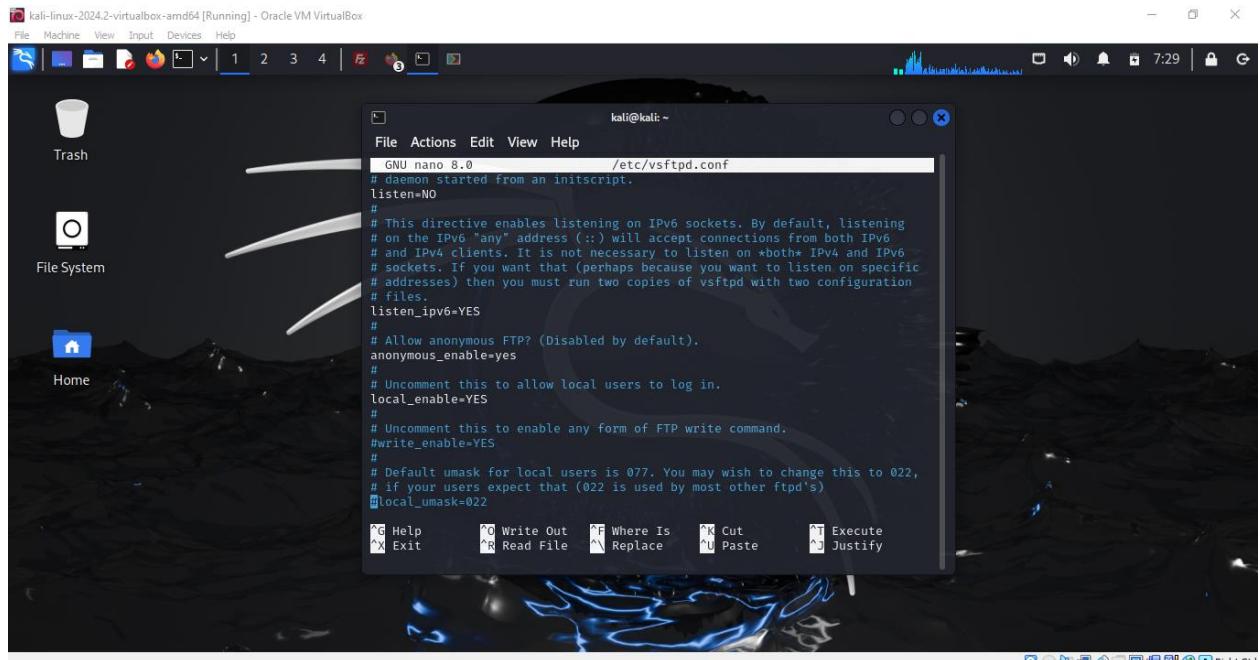
```
(kali㉿kali)-[~]
└─$ sudo usermod -d /srv/file/ftp
[...]
```

```
(kali㉿kali)-[~]
└─$ sudo systemctl status vsftpd
o vsftpd.service - vsftpd FTP server
   Loaded: loaded (/usr/lib/systemd/system/vsftpd.service; disabled; prese
     Active: inactive (dead)
lines 1-3/3 (END)
zsh: suspended  sudo systemctl status vsftpd
```

```
(kali㉿kali)-[~]
└─$ sudo systemctl enable vsftpd
Synchronizing state of vsftpd.service with SysV service script with /usr/lib/
systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable vsftpd
Created symlink /etc/systemd/system/multi-user.target.wants/vsftpd.service →
/usr/lib/systemd/system/vsftpd.service.
```

```
(kali㉿kali)-[~]
└─$ sudo systemctl status vsftpd
[...]
```

The terminal window has a dark theme. It includes a top bar with icons for file operations, a system tray with battery, signal strength, and volume, and a bottom taskbar with various application icons like file manager, browser, and terminal.



kali@kali: ~

```
GNU nano 8.0 /etc/vsftpd.conf
# sites. However, some broken FTP clients such as "ncFTP" and "mirror" assume
# the presence of the "-R" option, so there is a strong case for enabling it.
#ls_recurse_enable=YES
#
# Customization
# Some of vsftpd's settings don't fit the filesystem layout by
# default.
#       $HOME/uploads of home/biraj/pic.jpeg
# This option should be the name of a directory which is empty. Also, the
# directory should not be writable by the ftp user. This directory is used
# as a secure chroot() jail at times vsftpd does not require filesystem
# access.
secure_chroot_dir=/var/run/vsftpd/empty
#
# This string is the name of the PAM service vsftpd will use.
pam_service_name=vsftpd
#
# This option specifies the location of the RSA certificate to use for SSL
# encrypted connections.
rsa_cert_file=/etc/ssl/certs/ssl-cert-snakeoil.pem
rsa_private_key_file=/etc/ssl/private/ssl-cert-snakeoil.key
ssl_enable=NO
#
# Uncomment this to indicate that vsftpd use a utf8 filesystem.
#utf8_filesystem=YES
user_sub_token=$USER
local_root=/home/ftp/$USER
write_enable=YES
```

File Actions Edit View Help

Filesize: Filetype: Last modified: Permission: Owner: Group:

pic.jpeg 6,891 jpeg-file

Size Priority Status

Help files Write Out Where Is Cut Execute Location Undo Set Mark To Bracket Copy Where Was Previous Next

Exit Read File Replace Paste Go To Line Redo

Type here to search 85°F Partly sunny 5:16 PM 9/10/2024

kali@kali: ~

```
zsh: suspended sudo systemctl status vsftpd
(kali㉿kali)-[~]
$ sudo mv /home/kali/Downloads/pic.jpeg /srv/file/ftp ***
(kali㉿kali)-[~]
$ sudo service restart vsftpd
vsftpd: warning: vsftpd: not support FTP over TLS
vsftpd: warning: vsftpd: can't handle non-ASCII characters.
restart: unrecognized service
(kali㉿kali)-[~]
$ sudo systemctl restart vsftpd
[sudo] password for kali: 
Restarted service vsftpd in 1 second.
(kali㉿kali)-[~]
$ sudo apt install filezilla
Upgrading:
  gnutls-bin          libgnutls30t64  libnettle8t64
  libgnutls-dane0t64 libhogweed6t64

Installing:
  filezilla

Installing dependencies:
  filezilla-common    libfilezilla45  libpugixml1v5  liblibwxgtk3-2-1t64
  libfilezilla-common libpcre2-32-0   liblibwxbase3-2-1t64

Summary:
  Upgrading: 5, Installing: 8, Removing: 0, Not Upgrading: 943
  Download size: 13.9 MB
  Space needed: 43.5 MB / 64.6 GB available

Continue? [Y/n] y
Get:2 http://kali.download/kali kali-rolling/main amd64 libhogweed6t64 amd64
  3.10-1 [334 kB]
Get:1 http://mirrors.neusoft.edu.cn/kali kali-rolling/main amd64 libnettle8t6
  4 amd64 3.10-1 [303 kB]
```

Type here to search 85°F Partly sunny 5:15 PM 9/10/2024

```

kali@kali:~$ useradd -m biraj
Full Name []:
Room Number []:
Work Phone []:
Home Phone []:
Other []
Is the information correct? [Y/n] y
info: Adding new user `biraj' to supplemental / extra groups `users' ...
info: Adding user `biraj' to group `users' ...
(kali㉿kali)-[~] $ sudo nano /etc/vsftpd.chroot_list
Status: Disconnected from server
(kali㉿kali)-[~] $ sudo systemctl restart vsftpd
(kali㉿kali)-[~] $ sudo nano /etc/vsftpd.conf
(kali㉿kali)-[~] $ sudo systemctl restart vsftpd
(kali㉿kali)-[~] $ sudo systemctl restart vsftpd
(kali㉿kali)-[~] $ sudo systemctl status vsftpd
● vsftpd.service - vsftpd FTP server
   Loaded: loaded (/usr/lib/systemd/system/vsftpd.service; enabled; preset: enabled)
   Active: active (running) since Tue 2024-09-10 07:00:04 EDT; 8s ago
     Process: 26489 ExecStartPre=/bin/mkdir -p /var/run/vsftpd/empty (code-exit)
       Main PID: 26491 (vsftpd)
          Tasks: 1 (limit: 2272)
         Memory: 796.0K (peak: 1.6M)

vsftpd.service

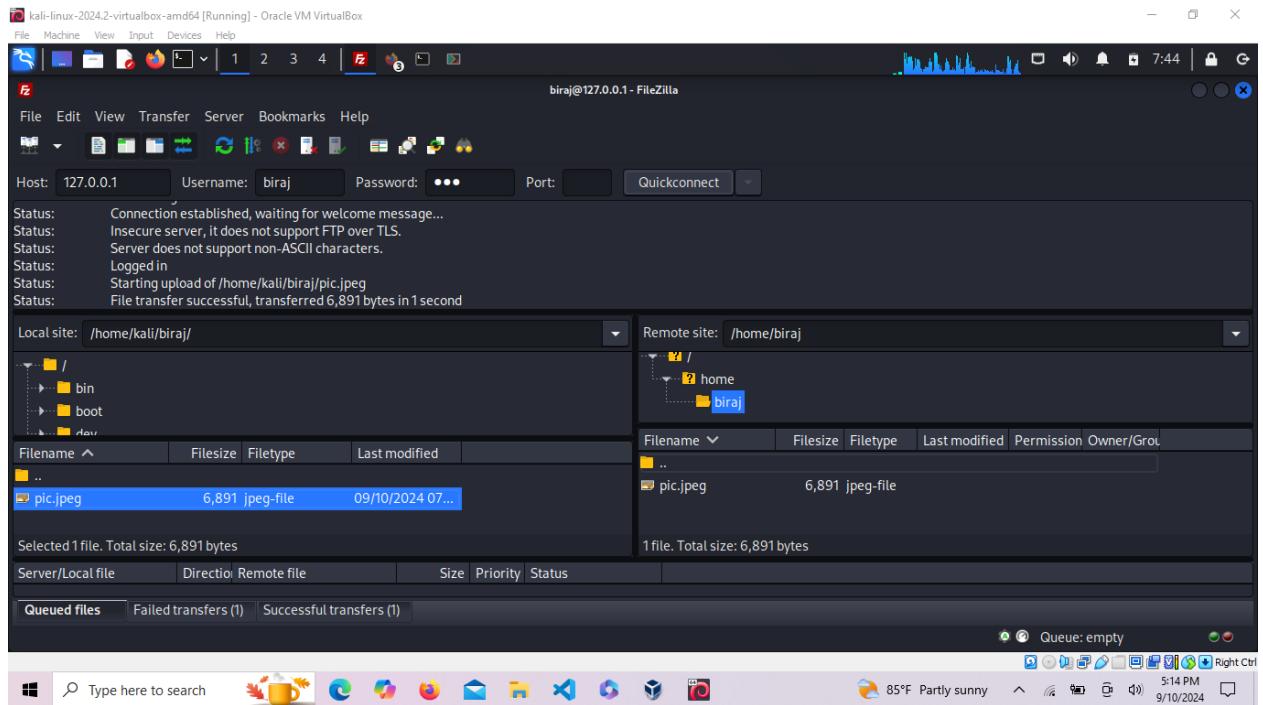
```

The terminal shows the creation of a user 'biraj' and the configuration of the vsftpd service to chroot users into their home directories. The configuration file /etc/vsftpd.conf is modified to include the chroot_list directive.

FileZilla interface showing a successful download of 'pic.jpeg' from the local site to the remote site.

Local site:	Remote site:
/home/kali/	/
..	..
.cache	pic.jpeg

Status messages indicate the download was successful, transferred 6,891 bytes in 1 second.



All the commands have been executed and the output has been obtained successfully.

SQUID

Experiment: 4

Aim: To create and configure Squid -proxy server

Description:

SQUID – PROXY SERVER

Squid is a full-featured web proxy cache server application which provides proxy and cache services for HyperText Transport Protocol (HTTP), File Transfer Protocol (FTP), and other popular network protocols. Squid can implement caching and proxying of Secure Sockets Layer (SSL) requests and caching of Domain Name Server (DNS) lookups, and perform transparent caching. Squid also supports a wide variety of caching protocols, such as Internet Cache Protocol (ICP), the HyperText Caching Protocol (HTCP), the Cache Array Routing Protocol (CARP), and the Web Cache Coordination Protocol (WCCP).

The Squid proxy cache server is an excellent solution to various proxy and caching server needs, and scales from the branch office to enterprise-level networks while providing extensive, granular access control mechanisms, and monitoring of critical parameters via the Simple Network Management Protocol (SNMP). When selecting a computer system for use as a dedicated Squid caching proxy server for many users ensure it is configured with a large amount of physical memory as Squid maintains an in-memory cache for increased performance.

Port No: 3128

Package name: squid

Configuration file: /etc/squid/squid.conf

Procedure:

1. At a terminal prompt, enter the following command to install the Squid server:

```
$sudo apt install squid
```

2. Squid is configured by editing the directives contained within the /etc/squid/squid.conf configuration file.
3. Change the access as shown below:

```
acl localnet src 192.168.234.139(your ip address)
acl blocksite dstdomain "etc/squid/blocksite"
http_access deny blocksite
http_access allow localnet
#http_access deny all
http_access allow all
```

4. To block access to the website we must configure using "etc/squid/blocksite"

we edit the file by running:

```
$cd /etc/squid
```

```
$sudo gedit blocksite
```

5. Add the websites to block:

in this case, I am blocking youtube, facebook, google

6. To check the actual functioning of the proxy server go to the browser and click settings, search proxy in connection settings.

7. To configure Proxy access to the internet

8. Select Manual Proxy configuration

9. Type your HTTP Proxy(IP Address) and Port number as 3128.

10. Select SOCKS v5

CONNECTING TO WEBSITE

11. Search for the blocked websites

12. Access is denied to the above websites

Result:

```
372 packages can be upgraded. Run 'apt list --upgradable' to see them.
root@UBUNTU:~$ sudo apt install squid
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libdbi-perl libecap3 squid-common squid-langpack
Suggested packages:
  libmldb-perl libnet-daemon libsql-statement-perl squidclient squid-cgi
  squid-purge resolvconf smbclient winbind
The following NEW packages will be installed:
  libdbi-perl libecap3 squid-common squid-langpack
0 upgraded, 5 newly installed, 0 to remove and 372 not upgraded.
Need to get 3,809 kB of archives.
After this operation, 14.9 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://archive.ubuntu.com/ubuntu jammy/main amd64 libecap3 amd64 1.0.1-3.2ubuntu4 [17.0 kB]
Get:2 http://archive.ubuntu.com/ubuntu jammy/main amd64 squid-langpack all 20200403-1 [170 kB]
Get:3 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 squid-common all 5.9-0ubuntu0.22.04.2 [204 kB]
Get:4 http://archive.ubuntu.com/ubuntu jammy/main amd64 libdbi-perl amd64 1.643-3build3 [741 kB]
Get:5 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 squid amd64 5.9-0ubuntu0.22.04.2 [2,678 kB]
Fetched 3,809 kB in 2s (1,811 kB/s)
Selecting previously unselected package libecap3:amd64.
(Reading database ... 16351 files and directories currently installed.)
Preparing to unpack .../libecap3_1.0.1-3.2ubuntu4_amd64.deb ...
Unpacking libecap3:amd64 (1.0.1-3.2ubuntu4) ...
Selecting previously unselected package squid-langpack.
Preparing to unpack .../squid-langpack_20200403-1_all.deb ...
Unpacking squid-langpack (20200403-1) ...
Selecting previously unselected package squid-common.
Preparing to unpack .../squid-common_5.9-0ubuntu0.22.04.2_all.deb ...
Unpacking squid-common (5.9-0ubuntu0.22.04.2) ...
Selecting previously unselected package libdbi-perl:amd64.
Preparing to unpack .../libdbi-perl_1.643-3build3_amd64.deb ...
Unpacking libdbi-perl:amd64 (1.643-3build3) ...
Selecting previously unselected package squid.
Preparing to unpack .../squid_5.9-0ubuntu0.22.04.2_amd64.deb ...
proxy::13:13:proxy:/bin:/usr/sbin/nologin
Unpacking squid (5.9-0ubuntu0.22.04.2) ...
Setting up squid-langpack (20200403-1) ...

Setting up libdbi-perl:amd64 (1.643-3build3) ...
Setting up libecap3:amd64 (1.0.1-3.2ubuntu4) ...
Setting up squid-common (5.9-0ubuntu0.22.04.2) ...
Setting up squid (5.9-0ubuntu0.22.04.2) ...
Setcap worked! /usr/lib/squid/pinger is not suid!
Skipping profile in /etc/apparmor.d/disable: usr.sbin.squid
Created symlink /etc/systemd/system/multi-user.target.wants/squid.service → /lib
/systemd/system/squid.service.
Processing triggers for ufw (0.36.1-4ubuntu0.1) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for libc-bin (2.35-0ubuntu3.1) ...
root@UBUNTU:~# cd /etc/squid/
root@UBUNTU:/etc/squid# nano squid.conf
root@UBUNTU:/etc/squid# systemctl restart squid
root@UBUNTU:/etc/squid# systemctl status squid
● squid.service - Squid Web Proxy Server
   Loaded: loaded (/lib/systemd/system/squid.service; enabled; vendor preset: en
   Active: active (running) since Mon 2024-09-09 13:12:47 IST; 13s ago
     Docs: man:squid(8)
   Process: 8236 ExecStartPre=/usr/sbin/squid --foreground -z (code=exited, st
 Main PID: 8239 (squid)
   Tasks: 4 (limit: 2254)
    Memory: 19.4M
      CPU: 203ms
     CGroup: /system.slice/squid.service
             └─8239 /usr/sbin/squid --foreground -sYC
                 ├─8241 "(squid-1)" --kid squid-1 --foreground -sYC
                 ├─8242 "(logfile-daemon)" /var/log/squid/access.log
                 └─8243 "(pinger)"

Sep 09 13:12:47 UBUNTU squid[8241]: Using Least Load store dir selection
Sep 09 13:12:47 UBUNTU squid[8241]: Set Current Directory to /var/spool/squid
Sep 09 13:12:47 UBUNTU squid[8241]: Finished loading MIME types and icons.
Sep 09 13:12:47 UBUNTU squid[8241]: HTTP Disabled.
Sep 09 13:12:47 UBUNTU squid[8241]: Pinger socket opened on FD 14
Sep 09 13:12:47 UBUNTU squid[8241]: Squid plugin modules loaded: 0
Sep 09 13:12:47 UBUNTU squid[8241]: Adaptation support is off.
Sep 09 13:12:47 UBUNTU squid[8241]: Accepting HTTP Socket connections at conn3 >
lines 1-23
[1]+  Stopped                  systemctl status squid
```

UBUNTU22 Clone Clone [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Terminal Sep 9 13:18 root@UBUNTU:/etc/squid

```
GNU nano 6.2
squid.conf

# Protect web applications running on the same server as Squid. They often
# assume that only local users can access them at "localhost" ports.
#http_access deny to_localhost

# Protect cloud servers that provide local users with sensitive info about
# their server via certain well-known link-local (a.k.a. APIPA) addresses.
#http_access deny to_linklocal

# INSERT YOUR OWN RULE(S) HERE TO ALLOW ACCESS FROM YOUR CLIENTS
# include /etc/squid/conf.d/*.conf

# For example, to allow access from your local networks, you may uncomment the
# following rule (and/or add rules that match your definition of "local"):
# http_access allow localnet

# And finally deny all other access to this proxy
acl localnet src 10.0.2.15
acl blocksite dstdomain "/etc/squid/blocksite"
http_access deny blocksite
http_access allow localnet
http_access allow all
http_access deny all

# TAG: adapted_http_access
#   Allowing or Denying access based on defined access lists
#
# Essentially identical to http_access, but runs after redirectors
# and ICAP/eCAP adaptation. Allowing access control based on their
# output.
#
# If not set then only http_access is used.
#Default:
# Allow, unless rules exist in squid.conf.
```

Help Write Out Where Is Cut Execute Justify Location Go To Line Undo Redo Set Mark Copy

Exit Read File Replace

Type here to search

UBUNTU22 Clone Clone [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Terminal Sep 9 13:21 root@UBUNTU:/etc/squid

```
GNU nano 6.2
squid.conf

# require-proxy-header
#   Require PROXY protocol version 1 or 2 connections.
#   The proxy_protocol_access is required to permit
#   downstream proxies which can be trusted.

# worker-queues
#   Ask TCP stack to maintain a dedicated listening queue
#   for each worker accepting requests at this port.
#   Requires TCP stack that supports the SO_REUSEPORT socket
#   option.

# SECURITY WARNING: Enabling worker-specific queues
#   allows any process running as Squid's effective user to
#   easily accept requests destined to this port.

# If you run Squid on a dual-homed machine with an internal
# and an external interface we recommend you to specify the
# internal address:port in http_port. This way Squid will only be
# visible on the internal address.

# Squid normally listens to port 3128
http_port 3128

# TAG: https_port
#   Usage: [ip:]port [mode] tls-cert=certificate.pem [options]
#   The socket address where Squid will listen for client requests made
#   over TLS or SSL connections. Commonly referred to as HTTPS.

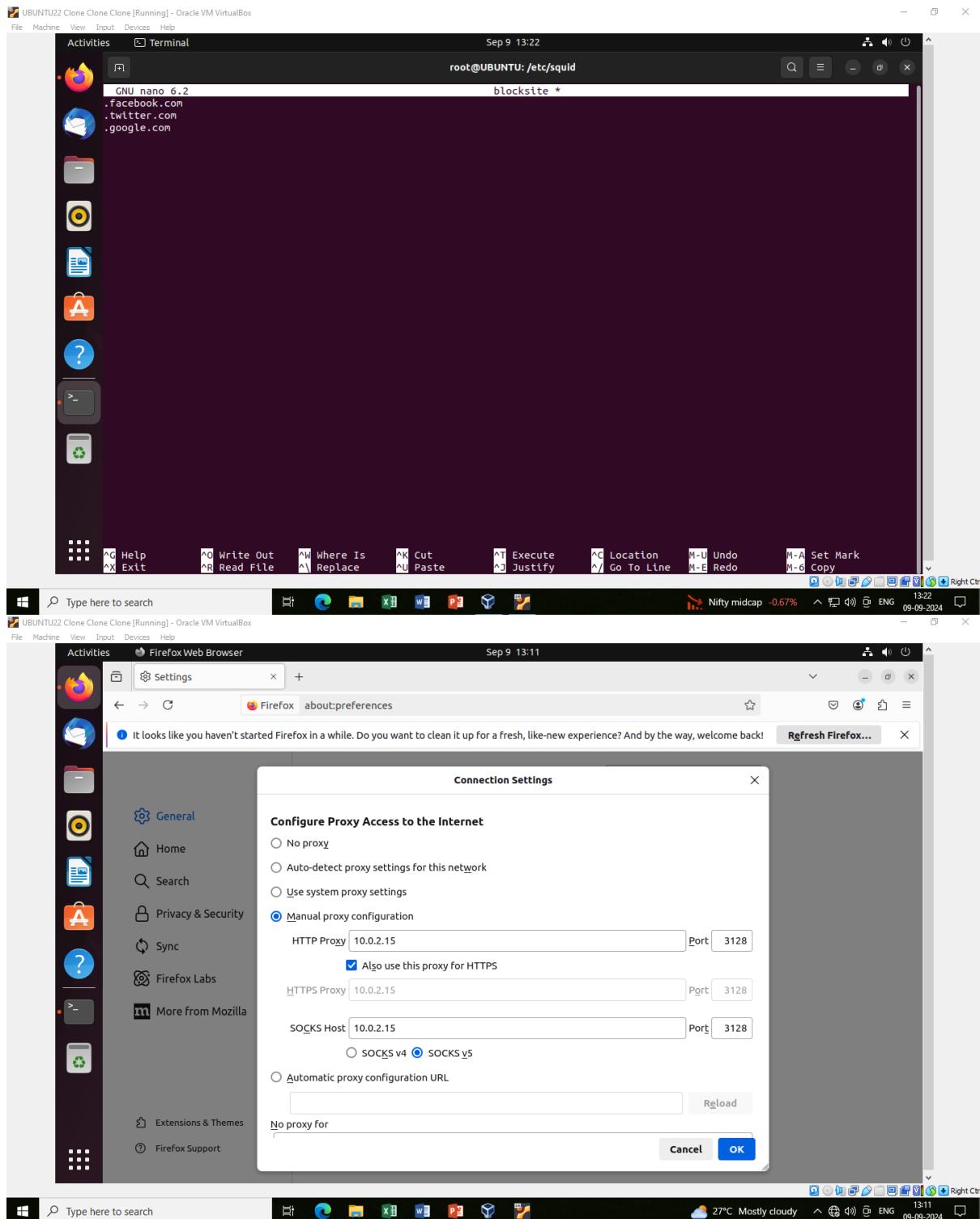
#   This is most useful for situations where you are running squid in
#   accelerator mode and you want to do the TLS work at the accelerator
#   level.
```

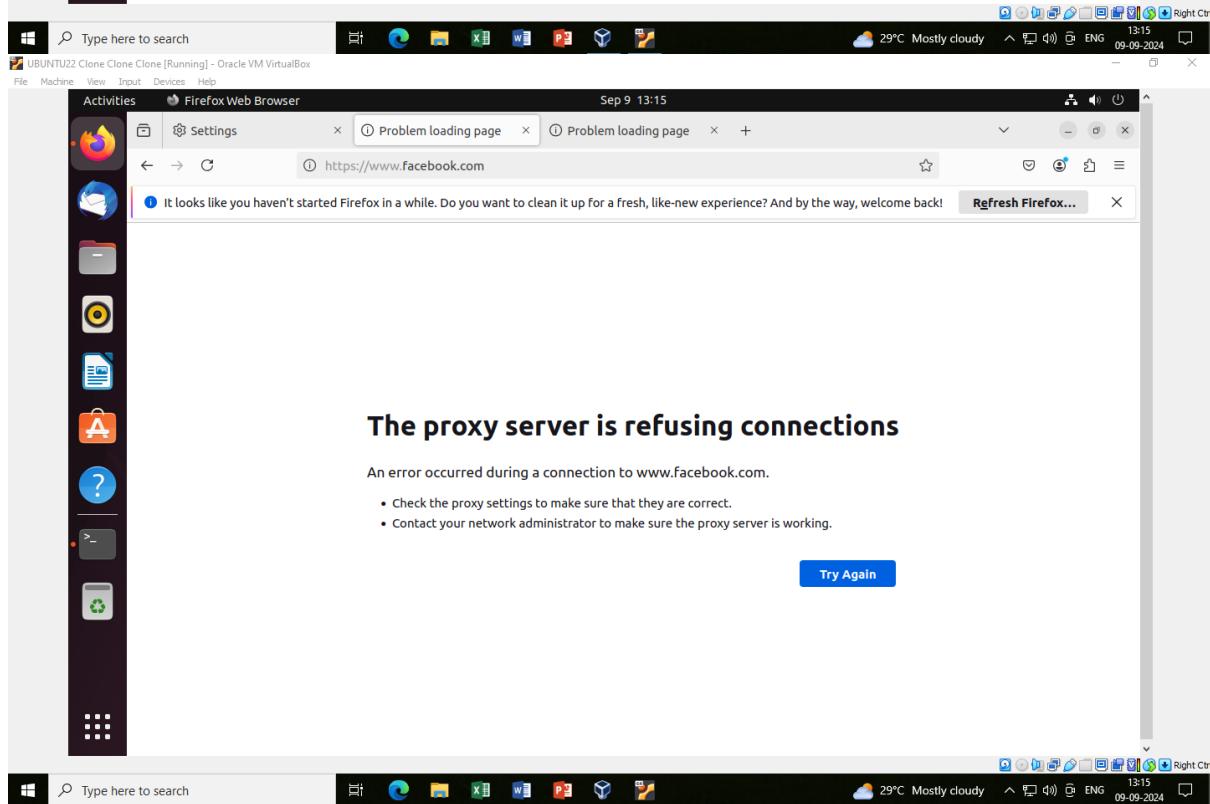
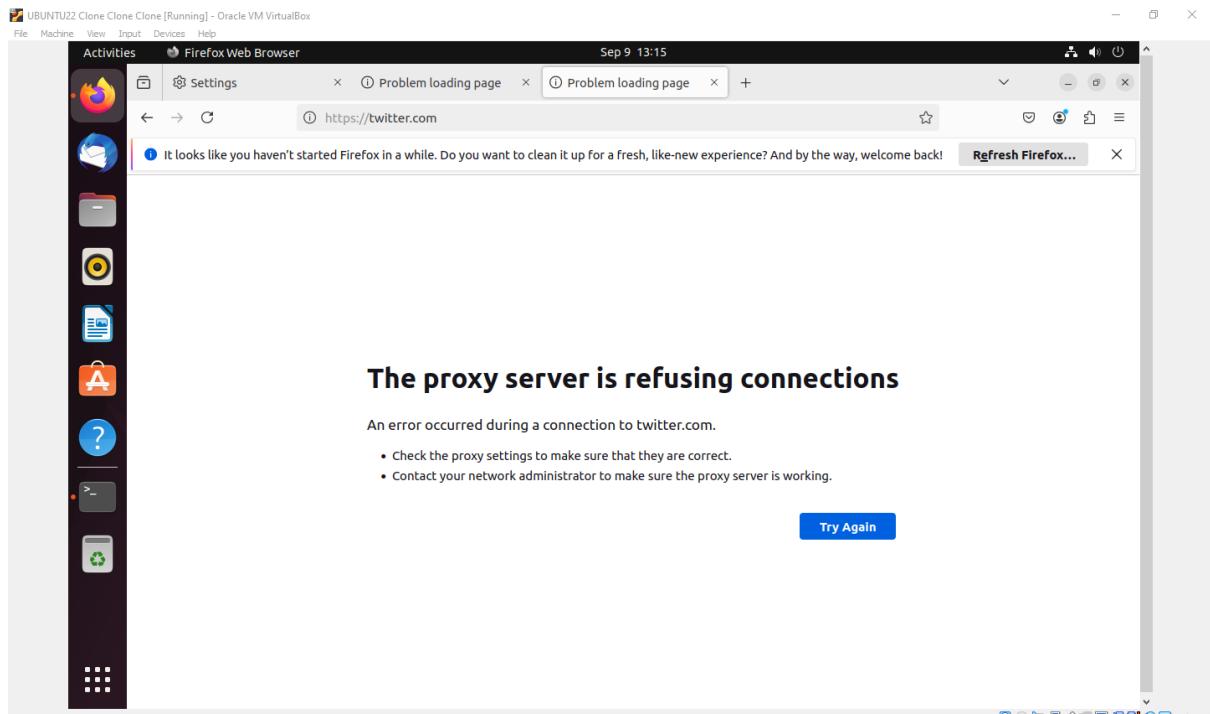
Help Write Out Where Is Cut Execute Justify Location Go To Line Undo Redo Set Mark Copy

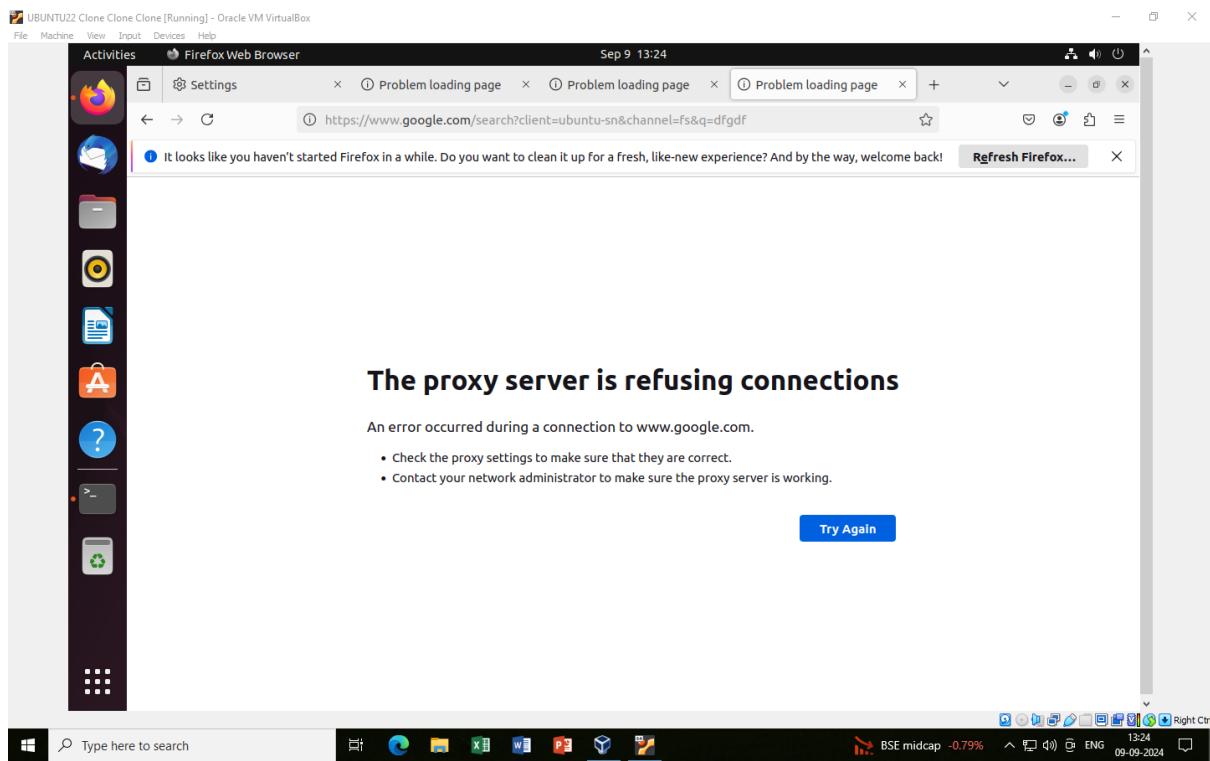
Exit Read File Replace

Type here to search

Cloud 29°C Mostly cloudy ENG 13:21 09-09-2024







All the commands have been executed and the output has been obtained successfully.

SSH

Experiment: 5

Aim: Installation of Open SSH between two ubuntu machines.

Description:

Remote File Sharing using SSH

OpenSSH is a powerful collection of tools for the remote control of, and transfer of data between, networked computers. You will also learn about some of the configuration settings possible with the OpenSSH server application and how to change them on your Ubuntu system.

OpenSSH is a freely available version of the Secure Shell (SSH) protocol family of tools for remotely controlling, or transferring files between computers. Traditional tools used to accomplish these functions, such as telnet or rcp, are insecure and transmit the user's password in cleartext when used. OpenSSH provides a server daemon and client tools to facilitate secure, encrypted remote control and file transfer operations, effectively replacing the legacy tools.

Port No: 22

Package name: openssh-client

Configuration file: /etc/ssh/sshd_config

Procedure:

1. create two EC2 instance of ubuntu ssh client and ssh server
2. Create the password for the instance of ssh server by \$sudo passwd ubuntu
3. Now check whether the ssh server is running by the command \$sudo service ssh status
4. configure the sshd_config file by the following command \$sudo vim /etc/ssh/sshd_config and include the following changes
PasswordAuthentication yes , KbdInteractiveAuthentication no ,KerberosGetAFSToken no
5. Now check the status of the ssh server by the command \$sudo service ssh status
6. Now create a text file by the command \$touch text.txt
7. Now log in to the ssh_client and create a ssh_keygen by the command \$ssh_keygen
8. Now copy the ssh_keygen form the ssh_client \$ssh-copy-id ubuntu@privateip
9. Now restart the client machine
10. Then connect to the ssh_server by ssh_client
11. then type ls you will be prompted with the screen with your text file which you have created

Result:

```
# HostbasedAuthentication
#IgnoreUserKnownHosts no
# Don't read the user's ~/.rhosts and ~/.shosts files
#IgnoreRhosts yes

# To disable tunneled clear text passwords, change to no here!
PasswordAuthentication yes
#PermitEmptyPasswords no

# Change to yes to enable challenge-response passwords (beware issues with
# some PAM modules and threads)
#KbdInteractiveAuthentication no

# Kerberos options
#KerberosAuthentication no
#KerberosOrLocalPasswd yes
#KerberosTicketCleanup yes
```

```
ubuntu@ip-172-31-11-168:~$ sudo vim /etc/ssh/sshd_config
ubuntu@ip-172-31-11-168:~$ sudo passwd ubuntu
New password:
Retype new password:
passwd: password updated successfully
ubuntu@ip-172-31-11-168:~$
ubuntu@ip-172-31-11-168:~$ sudo service ssh
 * Usage: /etc/init.d/ssh {start|stop|reload|force-reload|restart|try-restart|status}
ubuntu@ip-172-31-11-168:~$ sudo service ssh status
● ssh.service - OpenBSD Secure Shell server
    Loaded: loaded (/usr/lib/systemd/system/ssh.service; disabled; preset: enabled)
    Drop-In: /usr/lib/systemd/system/ssh.service.d
              └── ec2-instance-connect.conf
        Active: active (running) since Wed 2024-09-04 14:24:48 UTC; 39min ago
      TriggeredBy: ● ssh.socket
                    Docs: man:sshd(8)
                           man:sshd_config(5)
    Process: 1306 ExecStartPre=/usr/sbin/sshd -t (code=exited, status=0/SUCCESS)
   Main PID: 1308 (sshd)
      Tasks: 1 (limit: 1130)
     Memory: 2.1M (peak: 18.8M)
        CPU: 244ms
       CGroup: /system.slice/ssh.service
```

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

```
Last login: Wed Sep 4 14:05:05 2024 from 103.135.95.46
ubuntu@ip-172-31-4-149:~$ ssh ubuntu@172.31.11.168
(ubuntu@172.31.11.168) Password:
Welcome to Ubuntu 24.04 LTS (GNU/Linux 6.8.0-1012-aws x86_64)

 * Documentation: https://help.ubuntu.com
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/pro

System information as of Wed Sep 4 15:06:45 UTC 2024

System load: 0.0          Processes:           113
Usage of /: 23.0% of 6.71GB Users logged in:      1
Memory usage: 21%          IPv4 address for enX0: 172.31.11.168
Swap usage:  0%
```

Expanded Security Maintenance for Applications is not enabled.

CodeTogether ⚡ 0 ⚡ 0 Share Code Link Explain Code Comment Code Find Bugs Code Chat Search Error Go Live AI Code Chat

Type here to search

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

```
Last login: Wed Sep 4 14:49:53 2024 from 103.135.95.46
ubuntu@ip-172-31-11-168:~$ ls
biraj.txt  text.txt
ubuntu@ip-172-31-11-168:~$
```

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

Expanded Security Maintenance for Applications is not enabled.

CodeTogether ⚡ 0 ⚡ 0 Share Code Link Explain Code Comment Code Find Bugs Code Chat Search Error Go Live AI Code Chat

Type here to search

The screenshot shows the VS Code interface with the terminal tab active. The terminal window displays the following command and its execution:

```
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install the new keys
ubuntu@172.31.4.149: Permission denied (publickey).
ubuntu@ip-172-31-11-168:~$ ssh-keygen
Generating public/private ed25519 key pair.
Enter file in which to save the key (/home/ubuntu/.ssh/id_ed25519):
/home/ubuntu/.ssh/id_ed25519 already exists.
Overwrite (y/n)? y
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/ubuntu/.ssh/id_ed25519
Your public key has been saved in /home/ubuntu/.ssh/id_ed25519.pub
The key fingerprint is:
SHA256:cD77c3NgFWYRfnpYeERbLetjlAHi4Ed6P6GN8S0mEqQ ubuntu@ip-172-31-11-168
The key's randomart image is:
+--[ED25519 256]--+
| . o ... +B|
| . = . +*+|
| . + * . +B=|
| o * O .+=o|
| E . S * Boo..|
| . o . +*. |
| . . .o o |
| . ....o|
| .oo|
+---[SHA256]----+
ubuntu@ip-172-31-11-168:~$ ssh-copy-id ubuntu@172.31.4.149
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/ubuntu/.ssh/id_ed25519.pub"
```

The status bar at the bottom shows "CodeTogether" and various system icons.

The screenshot shows the VS Code interface with the terminal tab active. The terminal window displays the following command and its execution:

```
+---[SHA256]----+
ubuntu@ip-172-31-11-168:~$ ssh-copy-id ubuntu@172.31.11.168
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/ubuntu/.ssh/id_ed25519.pub"
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install the new keys
(ubuntu@172.31.11.168) Password:
Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'ubuntu@172.31.11.168'"
and check to make sure that only the key(s) you wanted were added.

ubuntu@ip-172-31-11-168:~$ ssh ubuntu@172.31.11.168
Welcome to Ubuntu 24.04 LTS (GNU/Linux 6.8.0-1012-aws x86_64)

 * Documentation: https://help.ubuntu.com
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/pro

System information as of Wed Sep  4 15:37:50 UTC 2024

 System load: 0.0          Processes:      117
 Usage of /: 23.0% of 6.71GB  Users logged in:     1
```

The status bar at the bottom shows "CodeTogether" and various system icons.

All the commands have been executed and the output has been obtained successfully.

