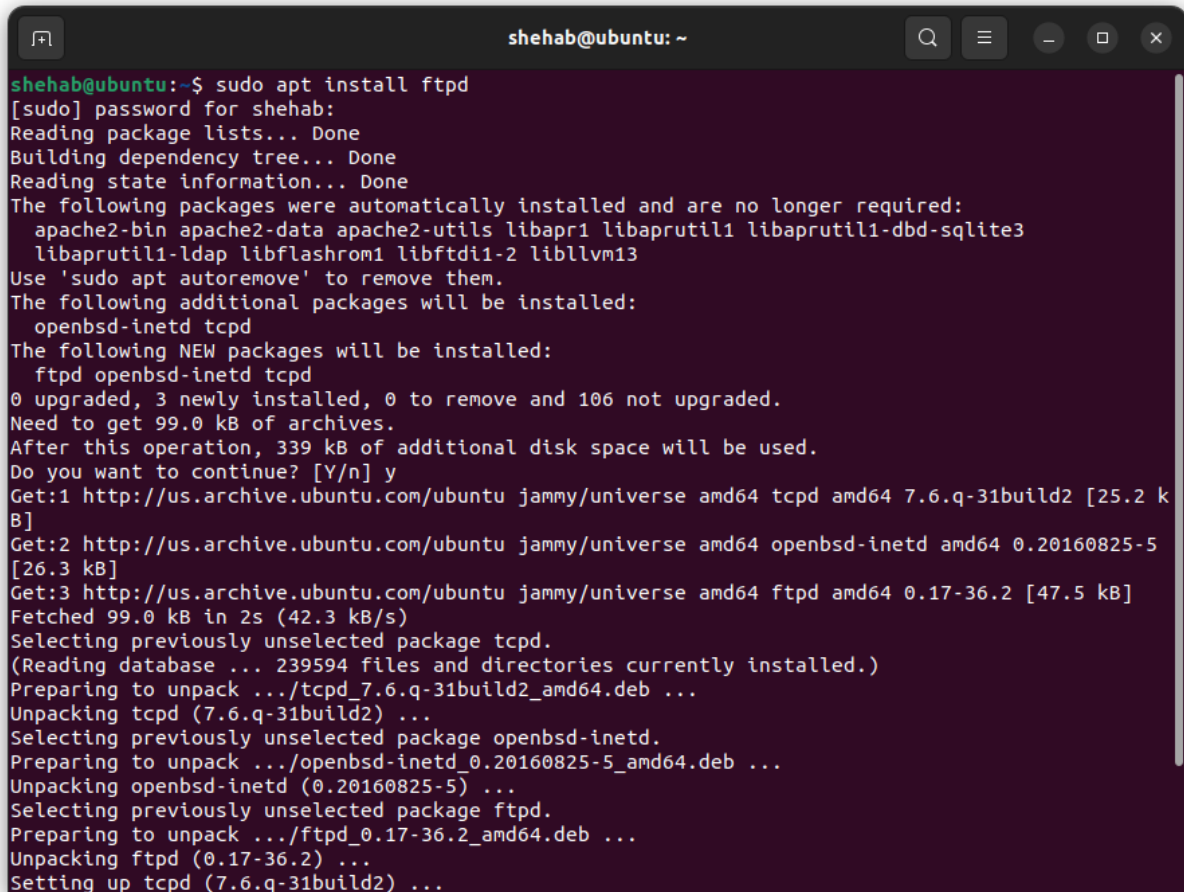


Shehab Hossam

Install ftpd service on your laptop

sudo apt install ftpd

A terminal window titled 'shehab@ubuntu: ~' with standard Ubuntu window controls. The terminal shows the command 'sudo apt install ftpd' and its output. The output indicates that several packages were automatically installed and are no longer required, including 'apache2-bin', 'apache2-data', 'apache2-utils', 'libapr1', 'libaprutil1', 'libaprutil1-dbd-sqlite3', 'libaprutil1-ldap', 'libflashrom1', 'libftdi1-2', and 'liblvm13'. It also shows that 'openbsd-inetd' and 'tcpd' will be installed along with 'ftpd'. The disk space requirements are listed as 99.0 kB for archives and 339 kB for additional disk space. The user confirms the installation with 'y'. The terminal then shows the progress of downloading and unpacking the packages: 'tcpd (7.6.q-31build2)', 'openbsd-inetd (0.20160825-5)', and 'ftpd (0.17-36.2)'.

```
shehab@ubuntu:~$ sudo apt install ftpd
[sudo] password for shehab:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  apache2-bin apache2-data apache2-utils libapr1 libaprutil1 libaprutil1-dbd-sqlite3
  libaprutil1-ldap libflashrom1 libftdi1-2 liblvm13
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  openbsd-inetd tcpd
The following NEW packages will be installed:
  ftpd openbsd-inetd tcpd
0 upgraded, 3 newly installed, 0 to remove and 106 not upgraded.
Need to get 99.0 kB of archives.
After this operation, 339 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us.archive.ubuntu.com/ubuntu jammy/universe amd64 tcpd amd64 7.6.q-31build2 [25.2 kB]
Get:2 http://us.archive.ubuntu.com/ubuntu jammy/universe amd64 openbsd-inetd amd64 0.20160825-5 [26.3 kB]
Get:3 http://us.archive.ubuntu.com/ubuntu jammy/universe amd64 ftpd amd64 0.17-36.2 [47.5 kB]
Fetched 99.0 kB in 2s (42.3 kB/s)
Selecting previously unselected package tcpd.
(Reading database ... 239594 files and directories currently installed.)
Preparing to unpack .../tcpd_7.6.q-31build2_amd64.deb ...
Unpacking tcpd (7.6.q-31build2) ...
Selecting previously unselected package openbsd-inetd.
Preparing to unpack .../openbsd-inetd_0.20160825-5_amd64.deb ...
Unpacking openbsd-inetd (0.20160825-5) ...
Selecting previously unselected package ftpd.
Preparing to unpack .../ftpd_0.17-36.2_amd64.deb ...
Unpacking ftpd (0.17-36.2) ...
Setting up tcpd (7.6.q-31build2) ...
```

enable port 21 and 20 (tcp) using iptables command using INPUT chain

sudo iptables -t filter -I INPUT -p tcp --dport 21 -j ACCEPT

sudo iptables -t filter -I INPUT -p tcp --dport 20 -j ACCEPT

```
shehab@ubuntu: ~  
shehab@ubuntu:~$ iptables  
iptables v1.8.7 (nf_tables): no command specified  
Try 'iptables -h' or 'iptables --help' for more information.  
shehab@ubuntu:~$ man iptables  
shehab@ubuntu:~$ man iptables | grep -p  
grep: invalid option -- 'p'  
Usage: grep [OPTION]... PATTERNS [FILE]...  
Try 'grep --help' for more information.  
shehab@ubuntu:~$ man iptables | grep "-p"  
grep: invalid option -- 'p'  
Usage: grep [OPTION]... PATTERNS [FILE]...  
Try 'grep --help' for more information.  
shehab@ubuntu:~$ man iptables  
shehab@ubuntu:~$ sudo iptables -t filter -I INPUT -p tcp --dport 20 -j ACCEPT  
[sudo] password for shehab:  
shehab@ubuntu:~$ sudo iptables -t filter -I INPUT -p tcp --dport 21 -j ACCEPT  
shehab@ubuntu:~$
```

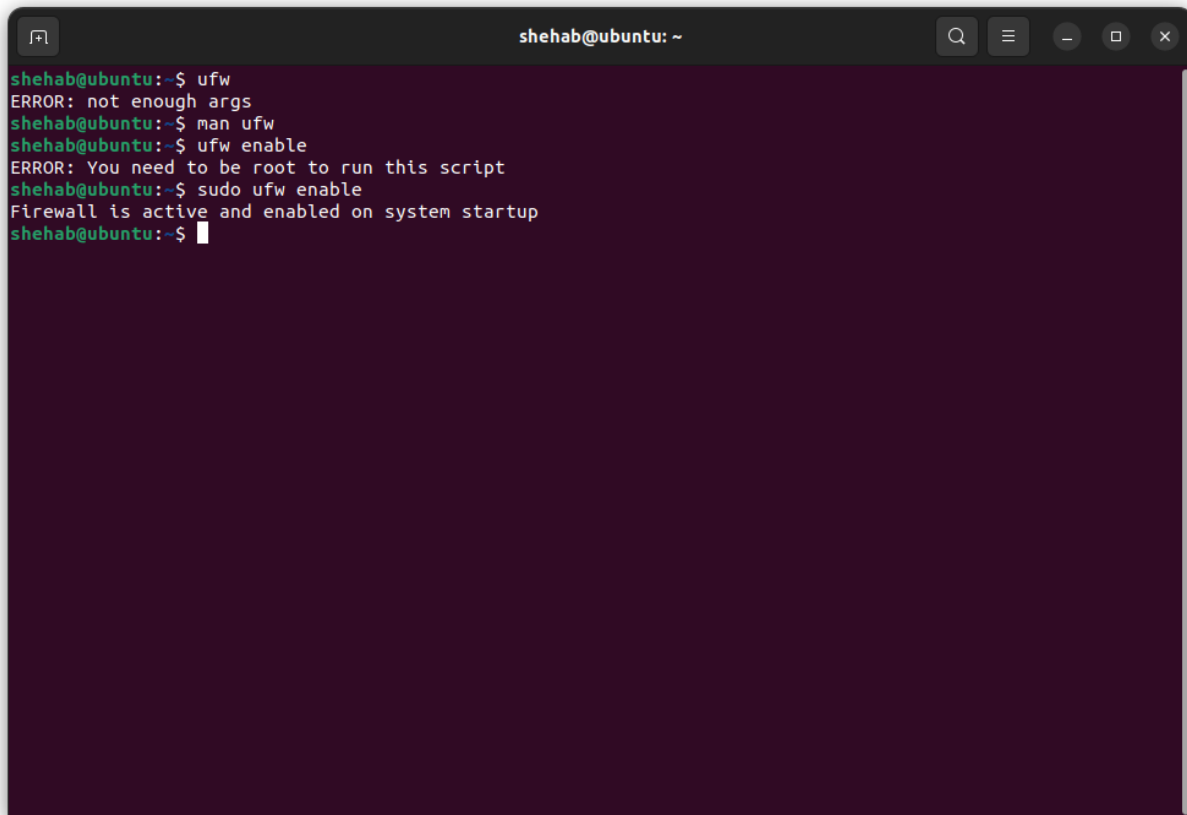
connect to ftp server (e.g: localhost) and browse the current directory

ftp localhost

```
shehab@ubuntu: ~  
?Invalid command.  
ftp> quit  
221 Goodbye.  
shehab@ubuntu:~$ ftp localhost  
Connected to localhost.  
220 ubuntu.myguest.virtualbox.org FTP server (Version 6.4/OpenBSD/Linux-ftpd-0.17) ready.  
Name (localhost:shehab): shehab  
331 Password required for shehab.  
Password:  
230 User shehab logged in.  
Remote system type is UNIX.  
Using binary mode to transfer files.  
ftp> ls  
229 Extended Passive Mode OK (|||57619|)  
150 Opening ASCII mode data connection for '/bin/ls'.  
total 150668  
-rw----- 1 shehab shehab      16125 06:36 5 أبر .bash_history  
-rw-r--r-- 1 shehab shehab       220 09:33 11 فير .bash_logout  
-rw-r--r-- 1 shehab shehab      3771 09:33 11 فير .bashrc  
drwx----- 17 shehab shehab      4096 05:55 1 أبر .cache  
drwx----- 18 shehab shehab      4096 13:56 20 فير .config  
drwxr-xr-x 2 shehab shehab      4096 07:38 25 فير Desktop  
-rw-rw-r-- 1 shehab shehab 102400000 06:03 1 أبر disk1.disk  
-rw-rw-r-- 1 shehab shehab 102400000 06:03 1 أبر disk2.disk  
-rw-rw-r-- 1 shehab shehab 102400000 08:22 28 مار disk3.disk  
-rw-rw-r-- 1 shehab shehab 102400000 08:06 28 مار disk4.disk  
drwxr-xr-x 2 shehab shehab      4096 09:49 11 فير Documents  
drwxr-xr-x 2 shehab shehab      4096 07:59 12 فير Downloads  
drwx----- 2 shehab shehab      4096 06:49 1 مار .gnupg  
-rwxr--r-- 1 root root         73 08:07 25 فير itiscript.sh  
-rwxrwx--- 1 shehab shehab       672 06:14 5 أبر lab3.txt  
drwxrwx--- 2 shehab shehab      4096 08:46 28 مار Lect 1  
-rw----- 1 shehab shehab        20 06:50 5 أبر .lessht  
drwx----- 3 shehab shehab      4096 09:49 11 فير .local
```

enable ufw service

sudo ufw enable

A terminal window titled 'shehab@ubuntu: ~' with standard Ubuntu window controls. The terminal shows a series of commands and their outputs: 'ufw' results in 'ERROR: not enough args'; 'man ufw' is executed; 'ufw enable' results in 'ERROR: You need to be root to run this script'; 'sudo ufw enable' results in 'Firewall is active and enabled on system startup'. The prompt returns to the root user after the sudo command.

```
shehab@ubuntu:~$ ufw
ERROR: not enough args
shehab@ubuntu:~$ man ufw
shehab@ubuntu:~$ ufw enable
ERROR: You need to be root to run this script
shehab@ubuntu:~$ sudo ufw enable
Firewall is active and enabled on system startup
shehab@ubuntu:~$
```

block port 21 and 21 (tcp) using ufw

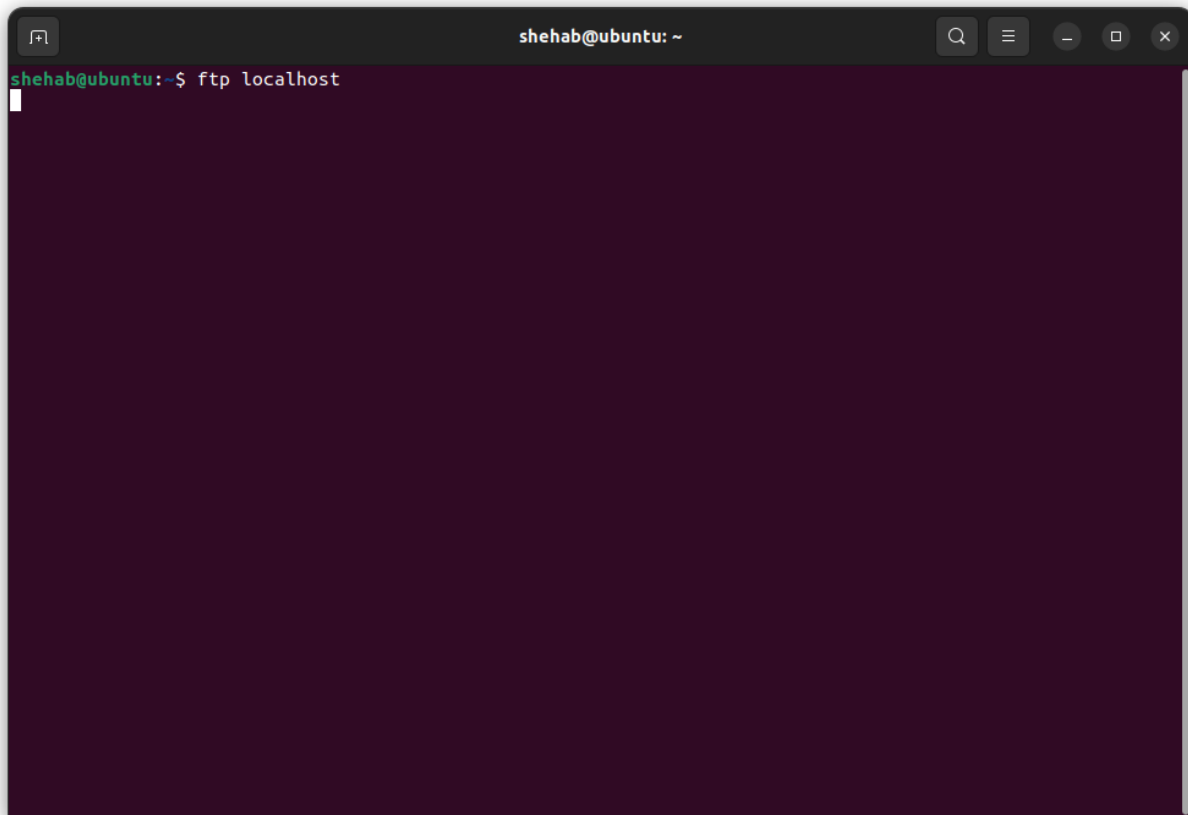
sudo ufw deny 20/tcp

sudo ufw deny 21/tcp

```
shehab@ubuntu: ~  
shehab@ubuntu:~$ ufw  
ERROR: not enough args  
shehab@ubuntu:~$ man ufw  
shehab@ubuntu:~$ ufw enable  
ERROR: You need to be root to run this script  
shehab@ubuntu:~$ sudo ufw enable  
Firewall is active and enabled on system startup  
shehab@ubuntu:~$ man ufw  
shehab@ubuntu:~$ sudo ufw deny 21/tcp  
Rule added  
Rule added (v6)  
shehab@ubuntu:~$ sudo ufw deny 20/tcp  
Rule added  
Rule added (v6)  
shehab@ubuntu:~$ sudo ufw status  
Status: active  
  
To Action From  
--  
Apache ALLOW Anywhere  
Apache Full ALLOW Anywhere  
21/tcp DENY Anywhere  
20/tcp DENY Anywhere  
Apache (v6) ALLOW Anywhere (v6)  
Apache Full (v6) ALLOW Anywhere (v6)  
21/tcp (v6) DENY Anywhere (v6)  
20/tcp (v6) DENY Anywhere (v6)  
  
shehab@ubuntu:~$
```

try to connect to ftp service

ftp localhost (I had to delete rules made in iptables earlier as well)

A terminal window with a dark background and a light-colored title bar. The title bar contains the text 'shehab@ubuntu: ~' and standard window control buttons (search, menu, zoom, close). The terminal content shows a green prompt 'shehab@ubuntu:~\$' followed by the command 'ftp localhost' in white text. A white cursor is positioned at the end of the command line.

```
shehab@ubuntu: ~  
shehab@ubuntu:~$ ftp localhost
```

capture the ufw log to detect the blocked operation

`sudo dmesg`

```
shehab@ubuntu: ~  
pparmor_parser"  
[ 442.897156] audit: type=1400 audit(1680690173.009:64): apparmor="STATUS" operation="profile_replace" pr  
ofile="unconfined" name="snap.firefox.firefox" pid=5041 comm="apparmor_parser"  
[ 443.317116] audit: type=1400 audit(1680690173.427:65): apparmor="STATUS" operation="profile_replace" pr  
ofile="unconfined" name="snap.firefox.hook.configure" pid=5045 comm="apparmor_parser"  
[ 443.632127] audit: type=1400 audit(1680690173.737:66): apparmor="STATUS" operation="profile_replace" pr  
ofile="unconfined" name="snap.firefox.hook.connect-plug-host-hunspell" pid=5046 comm="apparmor_parser"  
[ 443.962850] audit: type=1400 audit(1680690174.067:67): apparmor="STATUS" operation="profile_replace" pr  
ofile="unconfined" name="snap.firefox.hook.disconnect-plug-host-hunspell" pid=5047 comm="apparmor_parser"  
[ 444.227111] audit: type=1400 audit(1680690174.330:68): apparmor="STATUS" operation="profile_replace" pr  
ofile="unconfined" name="snap.firefox.geckodriver" pid=5042 comm="apparmor_parser"  
[ 444.277509] audit: type=1400 audit(1680690174.378:69): apparmor="STATUS" operation="profile_replace" pr  
ofile="unconfined" name="snap.firefox.hook.post-refresh" pid=5048 comm="apparmor_parser"  
[ 444.743709] audit: type=1400 audit(1680690174.843:70): apparmor="STATUS" operation="profile_replace" pr  
ofile="unconfined" name="snap.snap-store.hook.configure" pid=5050 comm="apparmor_parser"  
[ 445.960071] audit: type=1400 audit(1680690176.054:71): apparmor="STATUS" operation="profile_replace" in  
fo="same as current profile, skipping" profile="unconfined" name="snap-update-ns.snap-store" pid=5049 comm  
="apparmor_parser"  
[ 446.063300] audit: type=1400 audit(1680690176.157:72): apparmor="STATUS" operation="profile_replace" pr  
ofile="unconfined" name="snap.snap-store.snap-store" pid=5051 comm="apparmor_parser"  
[ 447.230978] audit: type=1400 audit(1680690177.321:73): apparmor="STATUS" operation="profile_replace" pr  
ofile="unconfined" name="snap.snap-store.ubuntu-software" pid=5052 comm="apparmor_parser"  
[ 447.333326] audit: type=1400 audit(1680690177.424:74): apparmor="STATUS" operation="profile_replace" pr  
ofile="unconfined" name="snap.snap-store.ubuntu-software-local-file" pid=5053 comm="apparmor_parser"  
[ 467.736229] loop6: detected capacity change from 0 to 942872  
[ 499.629759] audit: type=1400 audit(1680690229.792:75): apparmor="STATUS" operation="profile_replace" pr  
ofile="unconfined" name="snap.snapd-desktop-integration.hook.configure" pid=5191 comm="apparmor_parser"  
[ 500.578253] audit: type=1400 audit(1680690230.740:76): apparmor="STATUS" operation="profile_replace" pr  
ofile="unconfined" name="snap.snapd-desktop-integration.snapd-desktop-integration" pid=5192 comm="apparmor  
_parser"  
[ 500.749141] audit: type=1400 audit(1680690230.912:77): apparmor="STATUS" operation="profile_replace" in  
fo="same as current profile, skipping" profile="unconfined" name="snap-update-ns.snapd-desktop-integration  
" pid=5190 comm="apparmor_parser"  
shehab@ubuntu:~$
```

install nfs service on your system

```
sudo apt install nfs-kernel-server -y
```

```
shehab@ubuntu: ~  
shehab@ubuntu:~$ sudo apt install nfs-kernel-server -y  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following packages were automatically installed and are no longer required:  
  apache2-bin apache2-data apache2-utils libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap  
  libflashrom1 libftdi1-2 liblvm13  
Use 'sudo apt autoremove' to remove them.  
The following additional packages will be installed:  
  keyutils libevent-core-2.1-7 libnfsidmap1 nfs-common rpcbind  
Suggested packages:  
  open-iscsi watchdog  
The following NEW packages will be installed:  
  keyutils libevent-core-2.1-7 libnfsidmap1 nfs-common nfs-kernel-server rpcbind  
0 upgraded, 6 newly installed, 0 to remove and 88 not upgraded.  
Need to get 615 kB of archives.  
After this operation, 2,235 kB of additional disk space will be used.  
Get:1 http://us.archive.ubuntu.com/ubuntu jammy/main amd64 libevent-core-2.1-7 amd64 2.1.12-stable-1build3  
  [93.9 kB]  
Get:2 http://us.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libnfsidmap1 amd64 1:2.6.1-1ubuntu1.2 [42.9 kB]  
Get:3 http://us.archive.ubuntu.com/ubuntu jammy/main amd64 rpcbind amd64 1.2.6-2build1 [46.6 kB]  
Get:4 http://us.archive.ubuntu.com/ubuntu jammy/main amd64 keyutils amd64 1.6.1-2ubuntu3 [50.4 kB]  
Get:5 http://us.archive.ubuntu.com/ubuntu jammy-updates/main amd64 nfs-common amd64 1:2.6.1-1ubuntu1.2 [241 kB]  
Get:6 http://us.archive.ubuntu.com/ubuntu jammy-updates/main amd64 nfs-kernel-server amd64 1:2.6.1-1ubuntu1.2 [140 kB]  
Fetched 615 kB in 2s (268 kB/s)  
Selecting previously unselected package libevent-core-2.1-7:amd64.  
(Reading database ... 239629 files and directories currently installed.)  
Preparing to unpack .../0-libevent-core-2.1-7_2.1.12-stable-1build3_amd64.deb ...  
Unpacking libevent-core-2.1-7:amd64 (2.1.12-stable-1build3) ...  
Selecting previously unselected package libnfsidmap1:amd64.
```

enable nfs service on the firewall

```
sudo iptables -t filter -I INPUT -p tcp --dport 2049 -j ACCEPT
```

```
sudo iptables -t filter -I INPUT -p udp --dport 2049 -j ACCEPT
```



```
shehab@ubuntu: ~  
shehab@ubuntu:~$ man nfs  
shehab@ubuntu:~$  
shehab@ubuntu:~$ man nfs | grep enable  
sion=1" enables a number of advanced features, such as NFSv4 sessions.  
ative to NFSs data transfer size (such as network environments that enable jumbo Ethernet  
To enable a machine to send jumbo frames on cards that support it, it is suffi-  
order to enable Kerberos security. Refer to the rpc.gssd(8) man page for details.  
shehab@ubuntu:~$ man nfs | grep activate  
shehab@ubuntu:~$ grep nfs /etc/servecis  
grep: /etc/servecis: No such file or directory  
shehab@ubuntu:~$ grep nfs /etc/servcises  
grep: /etc/servcises: No such file or directory  
shehab@ubuntu:~$ grep nfs /etc/services  
nfs          2049/tcp          # Network File System  
nfs          2049/udp          # Network File System  
shehab@ubuntu:~$ sudo iptables -t filter -I INPUT -p tcp --dport 2049 -j ACCEPT  
shehab@ubuntu:~$ sudo iptables -t filter -I INPUT -p udp --dport 2049 -j ACCEPT  
shehab@ubuntu:~$
```

create and share /tmp/shares folder using exportsfs command and /etc/exports file

sudo mkdir /tmp/nfs-shares

sudo mkdir share

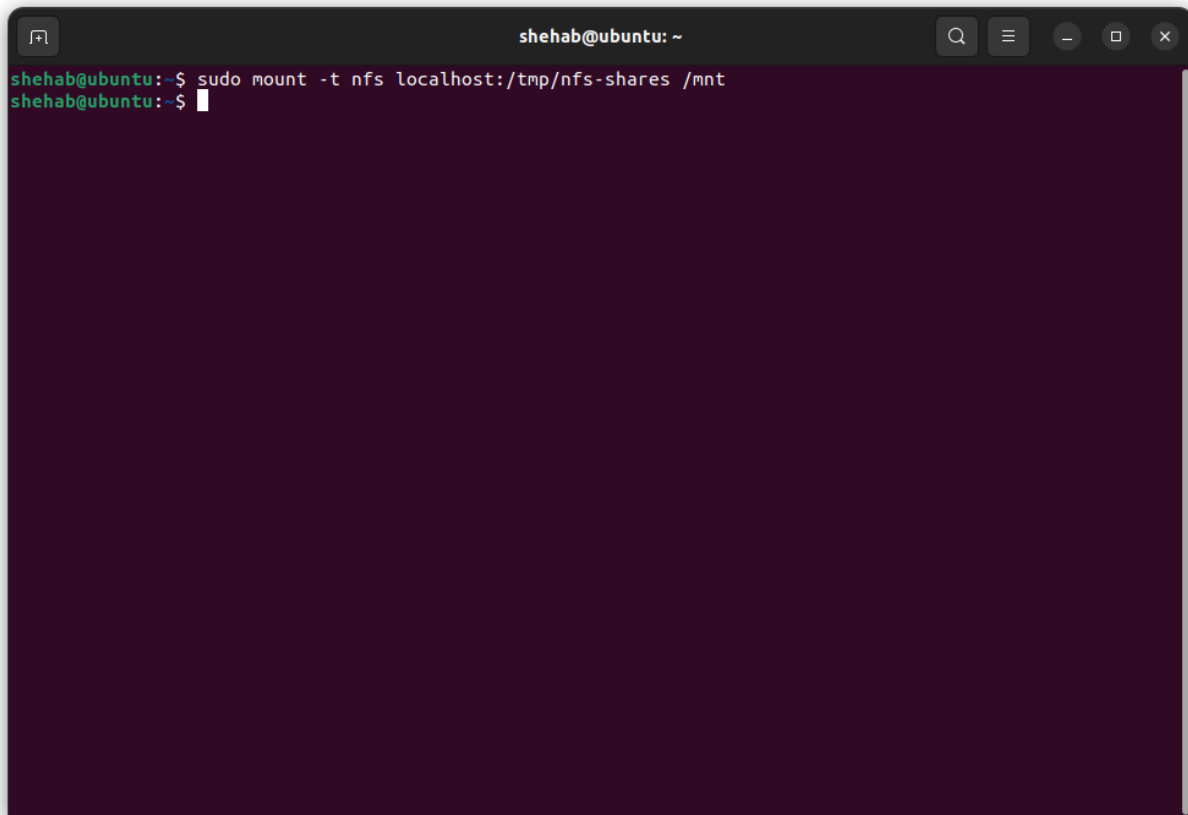
sudo nano /etc/exports

sudo exportsfs -a

```
shehab@ubuntu: /tmp
snap-private-tmp
systemd-private-b64e2170f20e46bfa29a6c18962732d5-colord.service-fvWQxk
systemd-private-b64e2170f20e46bfa29a6c18962732d5-fwupd.service-gC4K6J
systemd-private-b64e2170f20e46bfa29a6c18962732d5-ModemManager.service-KgtXla
systemd-private-b64e2170f20e46bfa29a6c18962732d5-power-profiles-daemon.service-G4JmK
systemd-private-b64e2170f20e46bfa29a6c18962732d5-switcheroo-control.service-KHuSpp
systemd-private-b64e2170f20e46bfa29a6c18962732d5-systemd-logind.service-7HZF4L
systemd-private-b64e2170f20e46bfa29a6c18962732d5-systemd-oond.service-i9sWdk
systemd-private-b64e2170f20e46bfa29a6c18962732d5-systemd-resolved.service-SNGz6t
systemd-private-b64e2170f20e46bfa29a6c18962732d5-systemd-timesyncd.service-G0cf5Q
systemd-private-b64e2170f20e46bfa29a6c18962732d5-upower.service-aNpkCw
tracker-extract-3-files.1000
tracker-extract-3-files.127
VMwareDnD
shehab@ubuntu:/tmp$ sudo mkdir share
shehab@ubuntu:/tmp$ ls
nfs-shares
share
snap-private-tmp
systemd-private-b64e2170f20e46bfa29a6c18962732d5-colord.service-fvWQxk
systemd-private-b64e2170f20e46bfa29a6c18962732d5-fwupd.service-gC4K6J
systemd-private-b64e2170f20e46bfa29a6c18962732d5-ModemManager.service-KgtXla
systemd-private-b64e2170f20e46bfa29a6c18962732d5-power-profiles-daemon.service-G4JmK
systemd-private-b64e2170f20e46bfa29a6c18962732d5-switcheroo-control.service-KHuSpp
systemd-private-b64e2170f20e46bfa29a6c18962732d5-systemd-logind.service-7HZF4L
systemd-private-b64e2170f20e46bfa29a6c18962732d5-systemd-oond.service-i9sWdk
systemd-private-b64e2170f20e46bfa29a6c18962732d5-systemd-resolved.service-SNGz6t
systemd-private-b64e2170f20e46bfa29a6c18962732d5-systemd-timesyncd.service-G0cf5Q
systemd-private-b64e2170f20e46bfa29a6c18962732d5-upower.service-aNpkCw
tracker-extract-3-files.1000
tracker-extract-3-files.127
VMwareDnD
shehab@ubuntu:/tmp$ sudo exportfs -a
shehab@ubuntu:/tmp$
```

mount the remote share on /mnt folder (you can using localhost as well)

```
sudo mount -t nfs localhost:/tmp/nfs-shares /mnt
```

A terminal window titled 'shehab@ubuntu: ~' with standard window controls. The prompt is 'shehab@ubuntu:~\$' and the command 'sudo mount -t nfs localhost:/tmp/nfs-shares /mnt' has been entered. The cursor is at the end of the second prompt line.

```
shehab@ubuntu:~$ sudo mount -t nfs localhost:/tmp/nfs-shares /mnt
shehab@ubuntu:~$
```

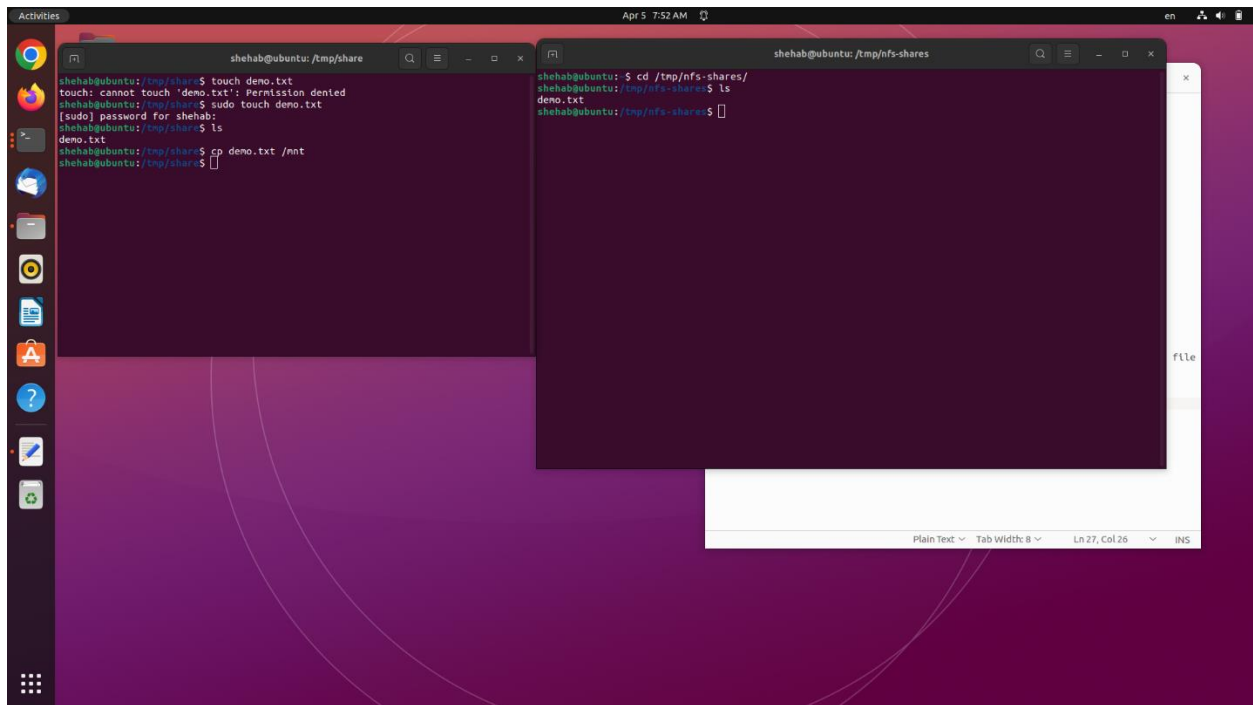
copy some files to the remote share

```
touch demo.txt
```

```
cp demo.txt /mnt
```

```
cd /tmp/nfs-shares/
```

```
ls
```



save iptables rules to /tmp/iptables-backup file

`sudo iptables-save > ./iptables-backup`

```
shehab@ubuntu: /tmp
systemd-private-b64e2170f20e46bfa29a6c18962732d5-systemd-logind.service-7HZF4L
systemd-private-b64e2170f20e46bfa29a6c18962732d5-systemd-oomd.service-i9sWdk
systemd-private-b64e2170f20e46bfa29a6c18962732d5-systemd-resolved.service-SNGz6t
systemd-private-b64e2170f20e46bfa29a6c18962732d5-systemd-timesyncd.service-G0cf5Q
systemd-private-b64e2170f20e46bfa29a6c18962732d5-upower.service-aNpkCw
tracker-extract-3-files.1000
tracker-extract-3-files.127
VMwareDnD
shehab@ubuntu: /tmp$ sudo iptables-save > ./iptables-backup
shehab@ubuntu: /tmp$ cat iptables-backup
# Generated by iptables-save v1.8.7 on Wed Apr  5 08:04:22 2023
*filter
:INPUT DROP [0:0]
:FORWARD DROP [0:0]
:OUTPUT ACCEPT [5:200]
:ufw-after-forward - [0:0]
:ufw-after-input - [0:0]
:ufw-after-logging-forward - [0:0]
:ufw-after-logging-input - [0:0]
:ufw-after-logging-output - [0:0]
:ufw-after-output - [0:0]
:ufw-before-forward - [0:0]
:ufw-before-input - [0:0]
:ufw-before-logging-forward - [0:0]
:ufw-before-logging-input - [0:0]
:ufw-before-logging-output - [0:0]
:ufw-before-output - [0:0]
:ufw-logging-allow - [0:0]
:ufw-logging-deny - [0:0]
:ufw-not-local - [0:0]
:ufw-reject-forward - [0:0]
:ufw-reject-input - [0:0]
:ufw-reject-output - [0:0]
:ufw-skip-to-policy-forward - [0:0]
```