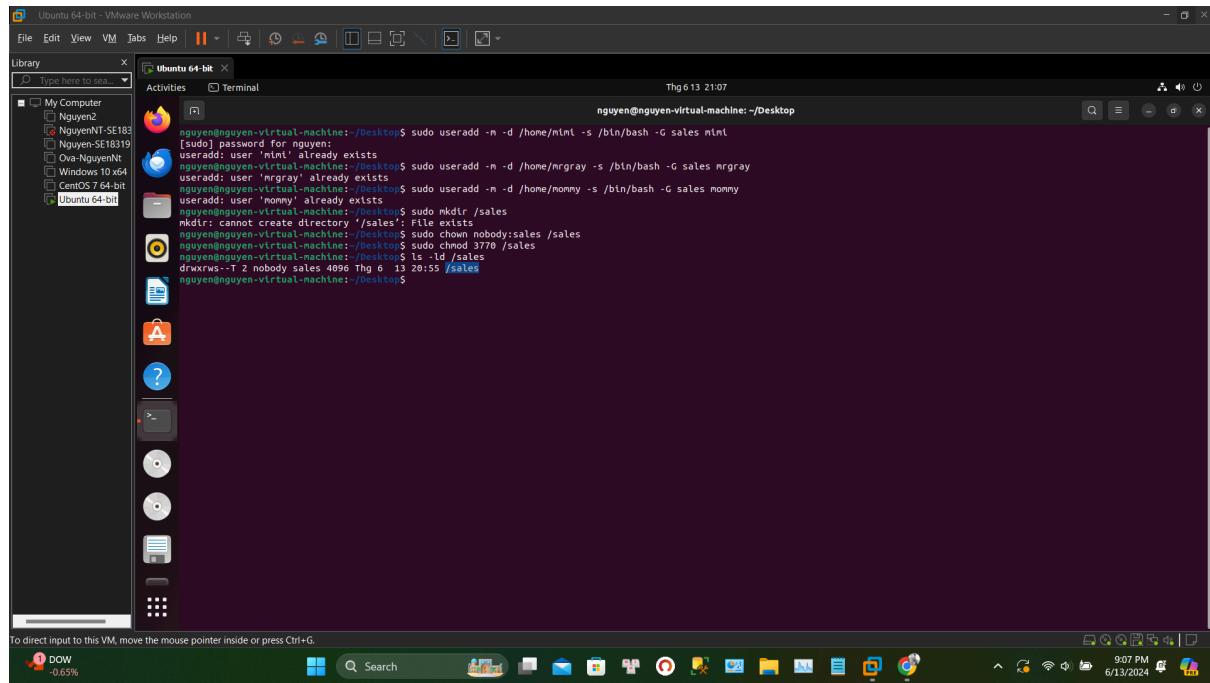
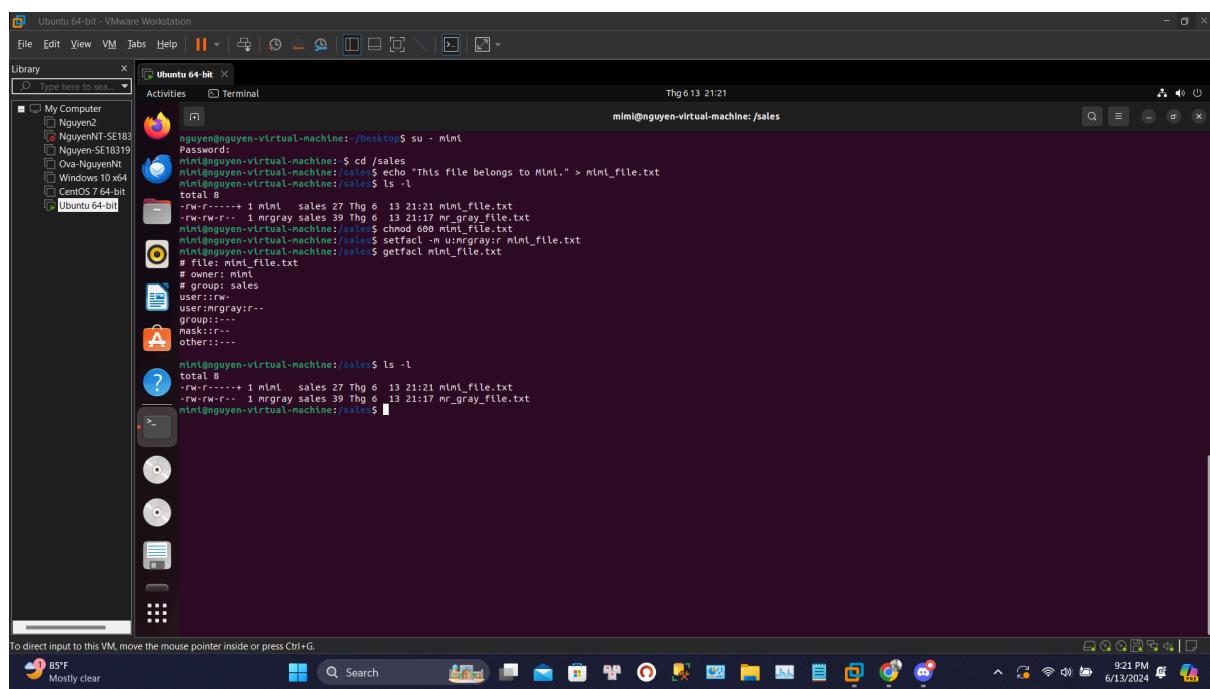


LAB 6 – Access control lists and Implementing mandatory access control

8.1 – Creating a shared group directory:

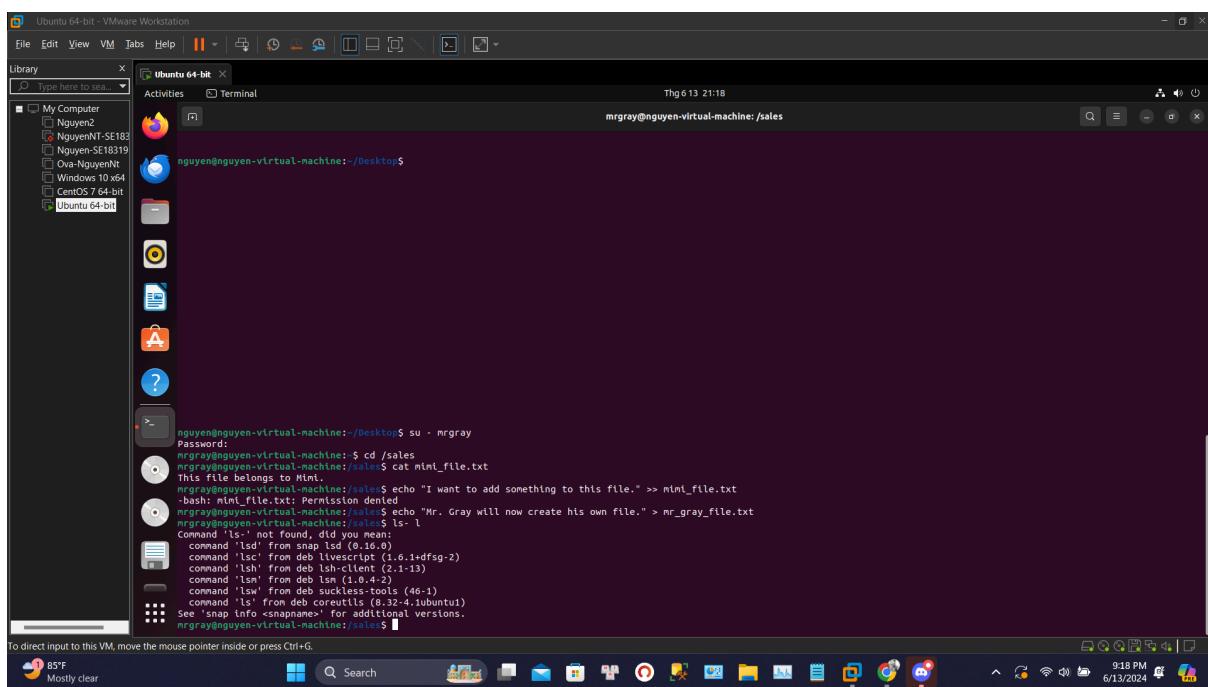
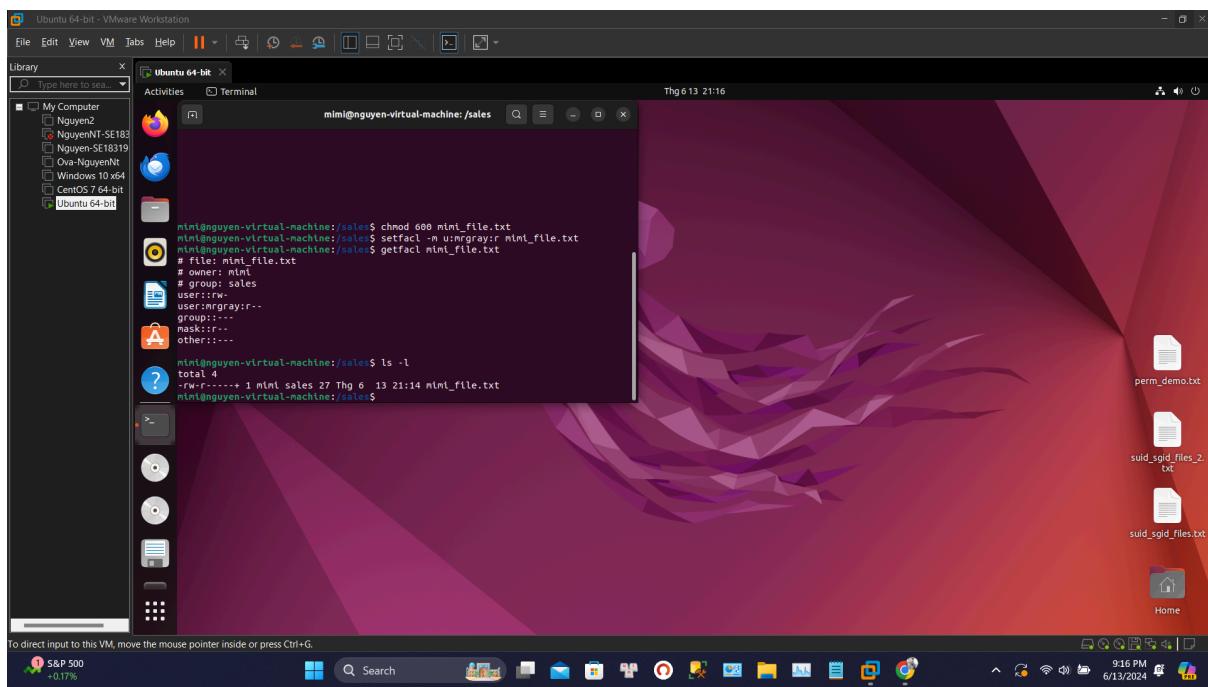


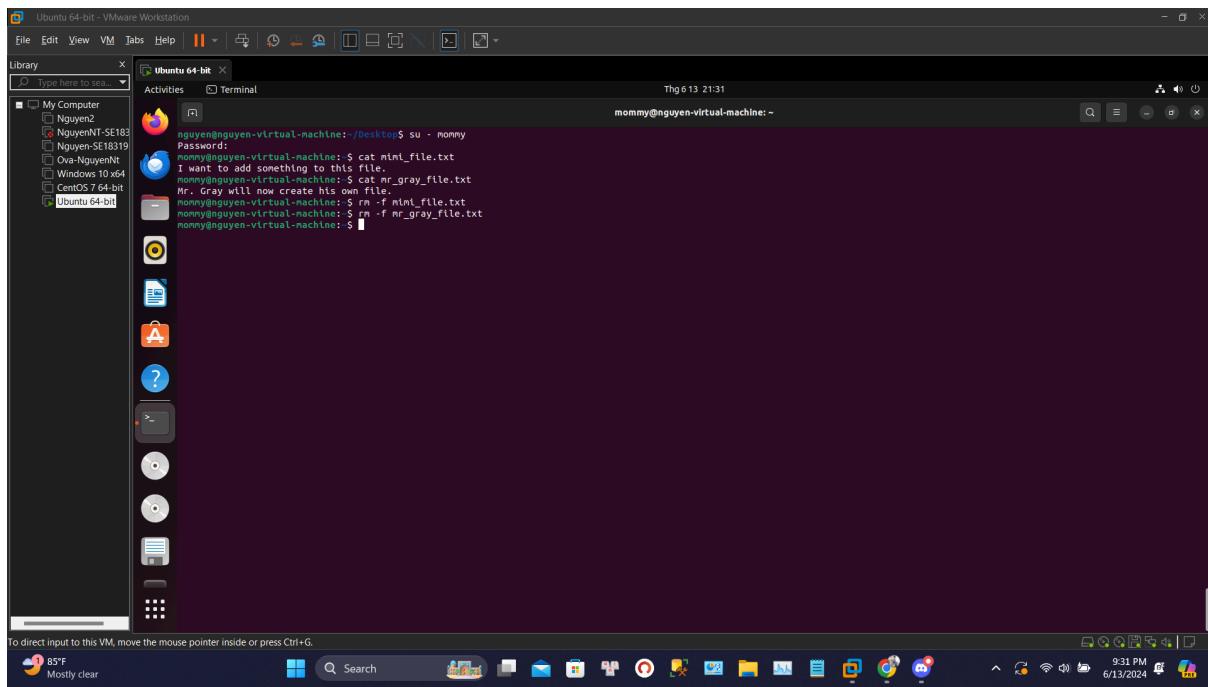
```
nguyen@nguyen-virtual-machine:~/Desktop$ sudo useradd -m -d /home/mmlt -s /bin/bash -G sales mmlt
[sudo] password for nguyen:
useradd: user 'mmlt' already exists
nguyen@nguyen-virtual-machine:~/Desktop$ sudo useradd -m -d /home/nrgray -s /bin/bash -G sales nrgray
useradd: user 'nrgray' already exists
nguyen@nguyen-virtual-machine:~/Desktop$ sudo useradd -m -d /home/momny -s /bin/bash -G sales momny
useradd: user 'momny' already exists
nguyen@nguyen-virtual-machine:~/Desktop$ sudo mkdirr /sales
mkdirr: cannot create directory '/sales': File exists
nguyen@nguyen-virtual-machine:~/Desktop$ sudo chmod 3770 /sales
nguyen@nguyen-virtual-machine:~/Desktop$ ls -ld /sales
drwxrws--- 2 nobody sales 4096 Thg 6 13 20:55 /sales
nguyen@nguyen-virtual-machine:~/Desktop$
```



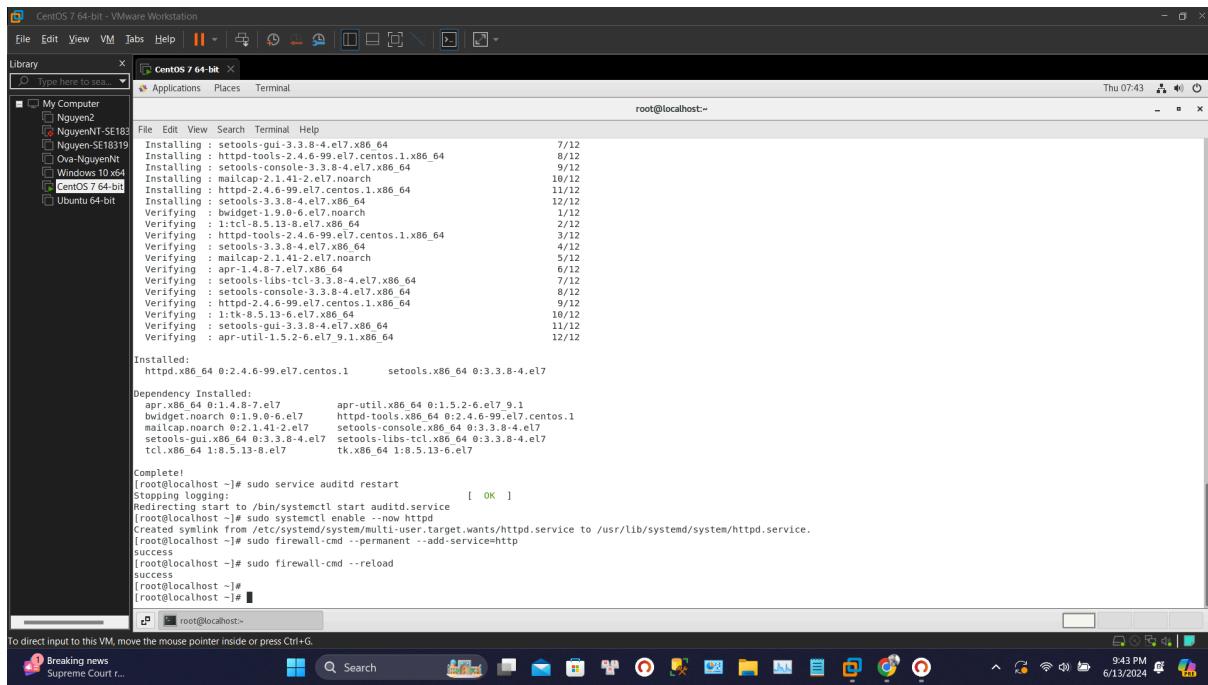
```
mimi@nguyen-virtual-machine:~$ su - mmlt
Password:
mimi@nguyen-virtual-machine:~$ cd /sales
mimi@nguyen-virtual-machine:/sales$ echo "This file belongs to Mimi." > mmlt_file.txt
mimi@nguyen-virtual-machine:/sales$ ls -l
total 0
mmlt_file.txt 1 mmlt sales 27 Thg 6 13 21:21 mmlt_file.txt
miml@nguyen-virtual-machine:/sales$ chmod 600 mmlt_file.txt
miml@nguyen-virtual-machine:/sales$ setfacl -m u:nrgray:r: mmlt_file.txt
miml@nguyen-virtual-machine:/sales$ getfacl mmlt_file.txt
mmlt_file.txt:rw-r-- 1 mmlt sales 27 Thg 6 13 21:21 mmlt_file.txt
user::rwx
user:nrgray:r-
group::r-
mask::r-
other::r---

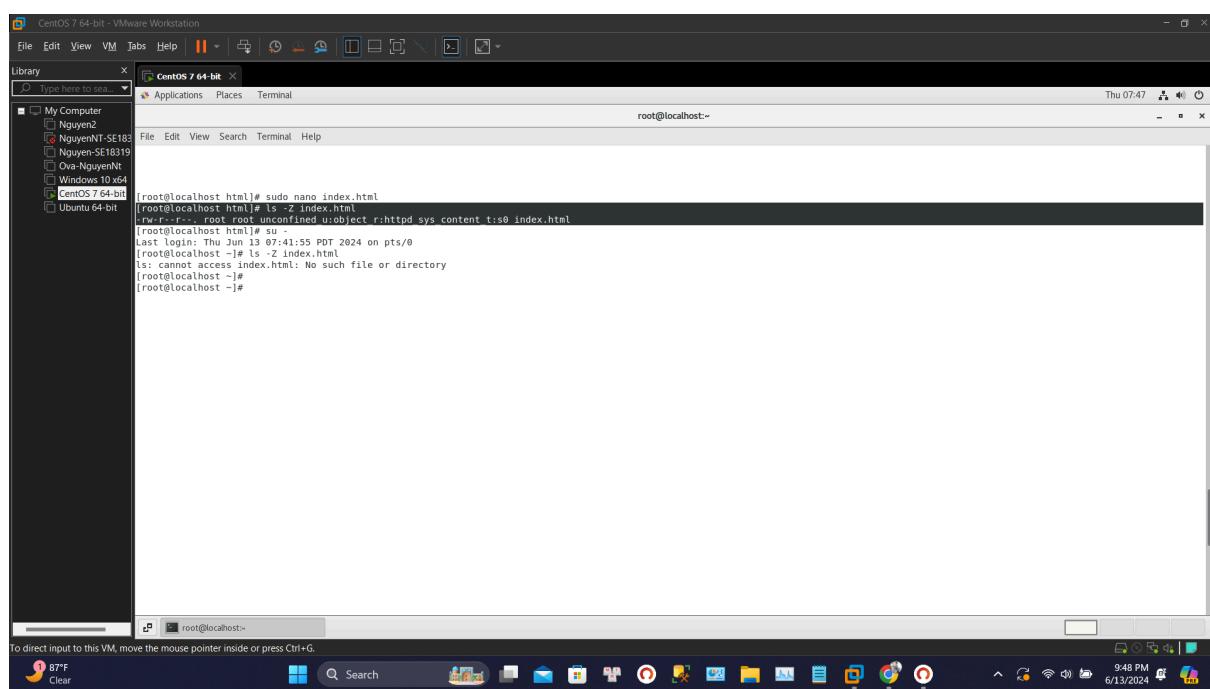
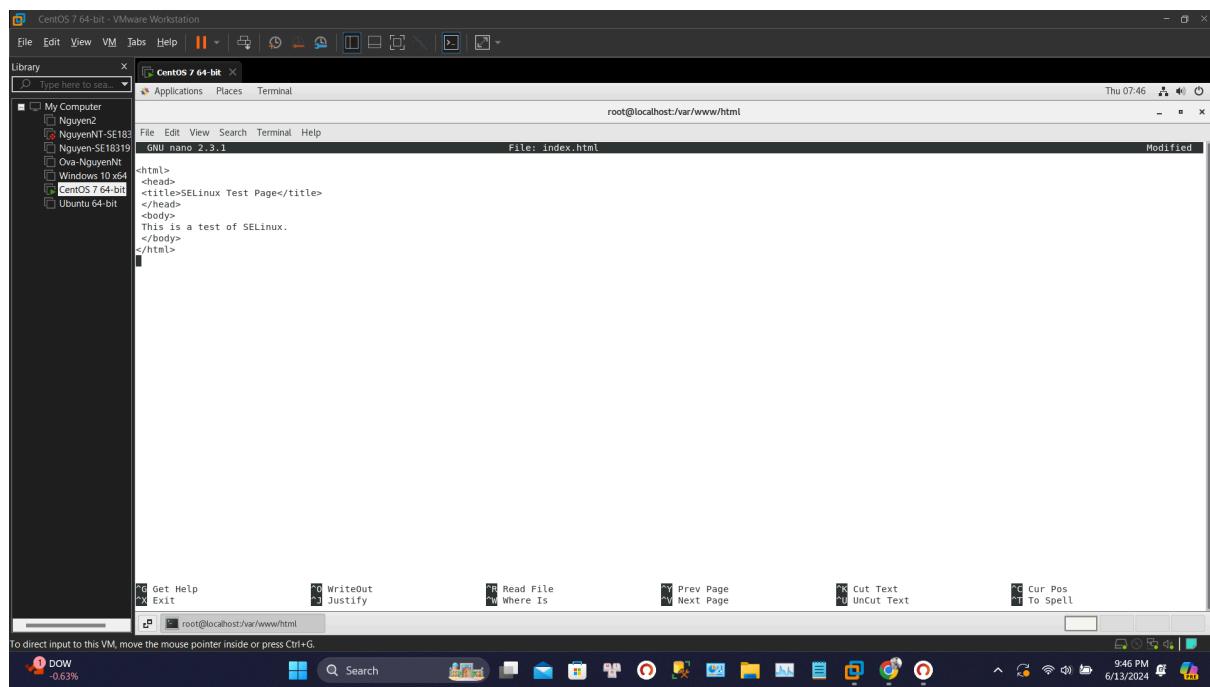
miml@nguyen-virtual-machine:/sales$ ls -l
total 0
mmlt_file.txt 1 mmlt sales 27 Thg 6 13 21:21 mmlt_file.txt
mr_gray_file.txt 1 nrgray sales 39 Thg 6 13 21:17 mr_gray_file.txt
miml@nguyen-virtual-machine:/sales$
```

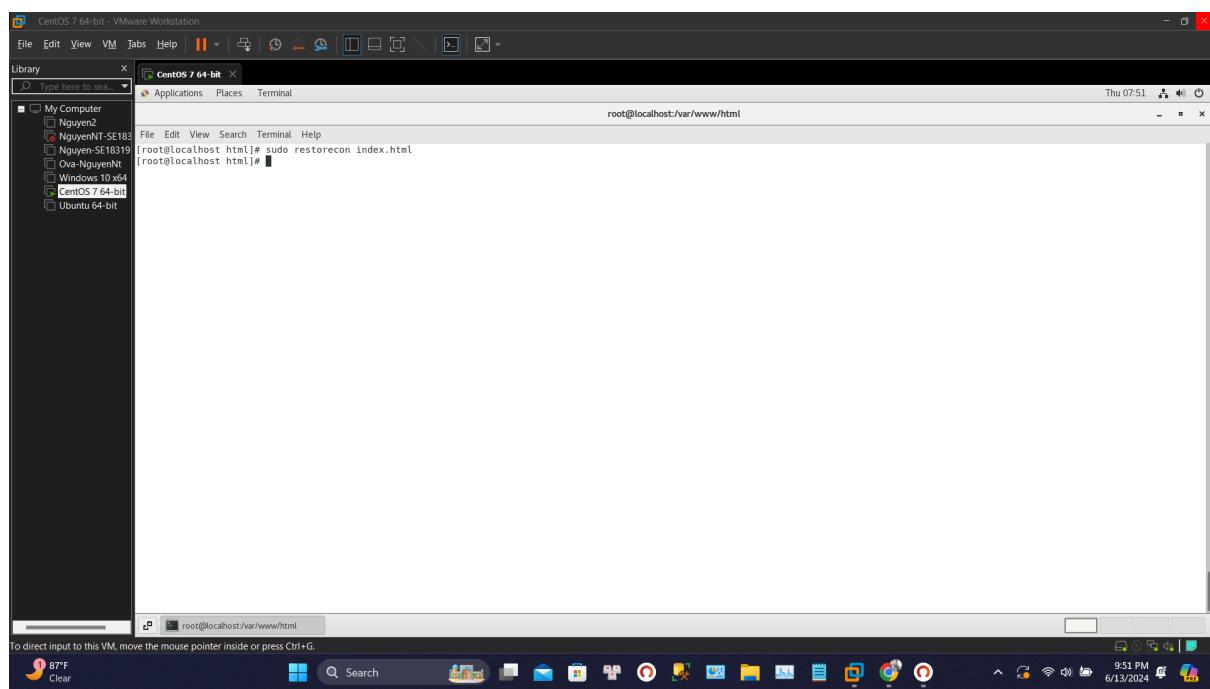
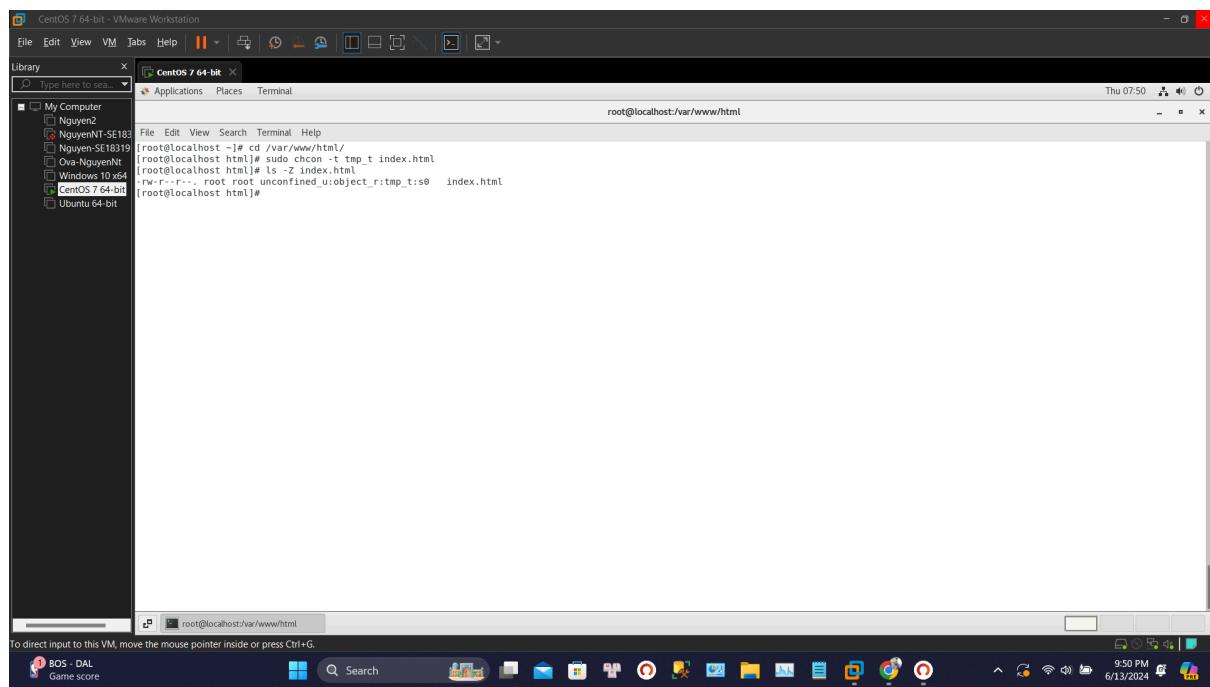




8.2 – SELinux type enforcement:







9.1 – SELinux Booleans and ports:

The screenshot shows a VMware Workstation interface with a CentOS 7 64-bit VM running. The terminal window displays the following command and its output:

```
[root@localhost ~]# sudo semanage port -a -s 82 -t http_port_t -p tcp  
[root@localhost ~]# sudo semanage port -l
```

SELinux Port Type	Proto	Port Number
afs1_callback_port_t	tcp	7001
afs1_callback_port_t	udp	7001
afs_bos_port_t	udp	7007
afs_fs_port_t	tcp	2040
afs_fs_port_t	udp	7000, 7005
afs_gpt_port_t	udp	7006
afs_pt_port_t	tcp	7892
afs_pt_port_t	udp	7802
afs_vl_port_t	udp	7003
agentx_port_t	tcp	705
agentx_port_t	udp	705
amanda_port_t	tcp	10000-10083
amanda_port_t	udp	10000-10082
amavisd_recv_port_t	tcp	10024
amavisd_send_port_t	tcp	10025
ampm_port_t	tcp	15672, 5671-5672
ampm_port_t	udp	5671-5672
aoe_port_t	tcp	5190-5193
aoe_port_t	udp	5190-5193
apc_port_t	tcp	3052
apc_port_t	udp	3052
apcupsd_port_t	tcp	3551
apcupsd_port_t	udp	3551
apertus_ldap_port_t	Tcp	539
apertus_ldap_port_t	udp	539
asterisk_port_t	tcp	1720
asterisk_port_t	udp	2427, 2727, 4569
audi_port_t	tcp	60
audi_port_t	tcp	113
bacula_port_t	tcp	9103
bacula_port_t	udp	9103
bctp_port_t	tcp	8999
bctp_port_t	udp	8999
bgp_port_t	tcp	179, 2605
bgp_port_t	udp	179, 2605
boinc_client_port_t	Tcp	1843
boinc_client_port_t	udp	1834

```

CentOS 7 64-bit - VMware Workstation
File Edit View VM Tabs Help || Type here to search... Applications Places Terminal root@localhost:~# Thu 07:55
Library
My Computer
  Nguyen2
  Nguyen-SE183
  Nguyen-SE1839
  Ova-NguyenNT
  Windows 10 x64
  CentOS 7 64-bit
  Ubuntu 64-bit
File Edit View Search Terminal Help
wccp_port_t      udp    2648
webm_port_t      tcp    9699
webm_port_t      udp    9698
whm_port_t       tcp    45, 4321
whois_port_t     udp    43, 4321
winshadow_port_t Tcp    3161
winshadow_port_t udp    3261
wsdapi_port_t   tcp    5357
wsdapi_port_t   udp    5357
wsicopy_port_t  tcp    3378
wsicopy_port_t  udp    3378
xdmcpc_port_t   tcp    177
xdmcpc_port_t   udp    177
xen_port_t      tcp    8002
xfr_port_t      tcp    7100
xiuexpansion3_port_t  tcp    2623
xiuexpansion3_port_t  udp    2623
xiuexpansion4_port_t  tcp    2624
xiuexpansion4_port_t  udp    2624
zabbix_comport_t  tcp    6032
zserver_port_t   tcp    6080-6020
zabbix_agent_port_t  tcp    10050
zabbix_port_t   tcp    10051
zarafa_port_t   tcp    2300, 237
zerobin_port_t  tcp    2606, 2608-2609, 2600-2604
zebra_port_t    udp    2606, 2608-2609, 2600-2604
zented_port_t   tcp    1229
zented_port_t   udp    1229
zookeeper_client_port_t  tcp    2181
zookeeper_election_port_t  tcp    3888
zookeeper_leader_port_t  tcp    8088
zope_port_t     tcp    8021
[root@localhost ~]# sudo systemctl restart httpd
[root@localhost ~]# sudo semanage -d 82 -t http_port_t -p tcp
usage: semanage [-h]
...
[import,export,login,user,port,ibpkey,ibendport,interface,module,node,fcontext,boolean,permissive,dontaudit]
...
semanage: error: argument subcommand: invalid choice: '82' (choose from 'import', 'export', 'login', 'user', 'port', 'ibpkey', 'ibendport', 'interface', 'module', 'node', 'fcontext', 'boolean', 'permissive', 'dontaudit')
[root@localhost ~]#

```

9.2 – Troubleshooting an AppArmor profile:

```

Ubuntu 64-bit - VMware Workstation
File Edit View VM Tabs Help || Type here to search... Activities Terminal nguyen@nguyen-virtual-machine: ~/Desktop
Library
My Computer
  Nguyen2
  Nguyen-SE183
  Nguyen-SE1839
  Ova-NguyenNT
  Windows 10 x64
  CentOS 7 64-bit
  Ubuntu 64-bit
File Edit View Search Terminal Help
nguyen@nguyen-virtual-machine:~/Desktop$ sudo apt install apparmor-utils apparmor-profiles apparmor-profiles-extra
[sudo] password for nguyen:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  python3-apparmor python3-libapparmor
Suggested packages:
  virt-manager
The following NEW packages will be installed:
  apparmor-profiles apparmor-profiles-extra apparmor-utils python3-apparmor
  python3-libapparmor
0 upgraded, 0 newly installed, 0 to remove and 175 not upgraded.
Need to get 0 B/210 kB of additional disk space.
After this operation, 1,596 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://vn.archive.ubuntu.com/ubuntu jammy-updates/main amd64 python3-libapparmor amd64 3.0.4-2ubuntu2.3 [29,5 kB]
Get:2 http://vn.archive.ubuntu.com/ubuntu jammy-updates/main amd64 python3-apparmor all 3.0.4-2ubuntu2.3 [81,1 kB]
Get:3 http://vn.archive.ubuntu.com/ubuntu jammy-updates/main amd64 apparmor-utils amd64 2.10.2-1 [59,5 kB]
Get:4 http://vn.archive.ubuntu.com/ubuntu jammy-updates/main amd64 apparmor-profiles amd64 1.34-1 [52,4 kB]
Get:5 http://vn.archive.ubuntu.com/ubuntu jammy/universe amd64 apparmor-profiles-extra all 1.34 [7,716 kB]
Fetched 210 kB in 5s (40,4 kB/s)
Selecting previously unselected package python3-libapparmor.
(Reading database ... 2020 packages available, reading the index...)
Preparing to unpack .../python3-libapparmor_3.0.4-2ubuntu2.3_amd64.deb ...
Unpacking python3-libapparmor (3.0.4-2ubuntu2.3) ...
Selecting previously unselected package python3-apparmor.
Preparing to unpack .../python3-apparmor_3.0.4-2ubuntu2.3_all.deb ...
Unpacking python3-apparmor (3.0.4-2ubuntu2.3) ...
Selecting previously unselected package apparmor-utils.
Preparing to unpack .../apparmor-utils_3.0.4-2ubuntu2.3_all.deb ...
Unpacking apparmor-utils (3.0.4-2ubuntu2.3) ...
Selecting previously unselected package apparmor-profiles.
Preparing to unpack .../apparmor-profiles_3.0.4-2ubuntu2.3_all.deb ...
Unpacking apparmor-profiles (3.0.4-2ubuntu2.3) ...
Selecting previously unselected package apparmor-profiles-extra.
Preparing to unpack .../apparmor-profiles-extra_1.34_all.deb ...
Unpacking apparmor-profiles-extra (1.34) ...
Setting up python3-libapparmor (3.0.4-2ubuntu2.3) ...
Setting up apparmor-utils (3.0.4-2ubuntu2.3) ...
Setting up apparmor-profiles-extra (1.34) ...
Setting up python3-apparmor (3.0.4-2ubuntu2.3) ...
Setting up apparmor-utils (3.0.4-2ubuntu2.3) ...
Processing triggers for man-db (2.10.2-1) ...

```

Ubuntu 64-bit - VMware Workstation

File Edit View VM Tabs Help

Library Type here to search

Activities Terminal

Ubuntu 64-bit

```
Weak crypto is allowed
WARNING: The 'netbios name' is too long (max. 15 chars).
Server role: ROLE_STANDALONE

Done
Setting up samba (2:4.15.13+dfsg-0ubuntu1.6) ...
Samba is not being run as an AD Domain Controller: Masking samba-ad-dc.service
Please file a bug report about deb-systemd-helper not finding those services.
Please enable deb-systemd-helper
Created symlink /etc/systemd/system/multi-user.target.wants/nmbd.service → /lib/systemd/system/nmbd.service.
Failed to preset unit: unit file /etc/systemd/system/samba-ad-dc.service is masked.
/usr/bin/deb-systemd-helper: error: systemctl preset failed on samba-ad-dc.service: No such file or directory
Created symlink /etc/systemd/system/multi-user.target.wants/smbd.service → /lib/systemd/system/smbd.service.
AppArmor profile for a FOF or multi-unit, not starting it.
Processing triggers for ufw (0.36.1-4ubuntu1.1) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for liblc-bits (2.35-0ubuntu3.7) ...
nguyen@nguyen-virtual-machine:~$ sudo systemctl status smbd
● smbd.service - Samba SMB Daemon
   Loaded: loaded (/lib/systemd/system/smbd.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2024-06-13 22:05:24 +07; 19s ago
     Docs: man:smbd(8)
          man:samba(7)
          man:manpages(5)
 Main PID: 3434 (smbd)
   Status: "smbd: ready to serve connections..."
    Tasks: 4 (limit: 4555)
   Memory: 10.5M
      CPU: 2.00ms
     CGroup: /system.slice/smbd.service
             └─3447 /usr/sbin/smbd --foreground -no-process-group
                 ├─3449 /usr/sbin/smbd --foreground -no-process-group
                 ├─3450 /usr/sbin/smbd --foreground -no-process-group
                 ├─3451 /usr/lib/x86_64-linux-gnu/samba/samba-bgd -ready-signal-fd=45 --parent-watch-fd=11 --debuglevel=0 -F

Thg 6 13 22:05:24 nguyen-virtual-machine systemd[1]: Starting Samba SMB Daemon...
Thg 6 13 22:05:24 nguyen-virtual-machine update-apparmor-samba-profile[3439]: grep: /etc/apparmor.d/samba/smbd-shares: No such file or directory
Thg 6 13 22:05:24 nguyen-virtual-machine update-apparmor-samba-profile[3442]: dtrf: /etc/apparmor.d/samba/smbd-shares: No such file or directory
Thg 6 13 22:05:24 nguyen-virtual-machine update-apparmor-samba-profile[3442]: Reloading updated AppArmor profile for Samba...
Thg 6 13 22:05:24 nguyen-virtual-machine systemd[1]: Started Samba SMB Daemon.
nguyen@nguyen-virtual-machine:~/Desktop$
```

To direct input to this VM, move the mouse pointer inside or press Ctrl+G.

87°F Clear 10:05 PM 6/13/2024

Ubuntu 64-bit - VMware Workstation

File Edit View VM Tabs Help

Library Type here to search

Activities Terminal

Ubuntu 64-bit

```
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for liblc-bits (2.35-0ubuntu3.7) ...
nguyen@nguyen-virtual-machine:~$ sudo systemctl status smbd
● smbd.service - Samba SMB Daemon
   Loaded: loaded (/lib/systemd/system/smbd.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2024-06-13 22:05:24 +07; 19s ago
     Docs: man:smbd(8)
          man:samba(7)
          man:manpages(5)
 Main PID: 3434 (smbd)
   Status: "smbd: ready to serve connections..."
    Tasks: 4 (limit: 4555)
   Memory: 10.5M
      CPU: 2.00ms
     CGroup: /system.slice/smbd.service
             └─3447 /usr/sbin/smbd --foreground -no-process-group
                 ├─3449 /usr/sbin/smbd --foreground -no-process-group
                 ├─3450 /usr/sbin/smbd --foreground -no-process-group
                 ├─3451 /usr/lib/x86_64-linux-gnu/samba/samba-bgd -ready-signal-fd=45 --parent-watch-fd=11 --debuglevel=0 -F

Thg 6 13 22:05:24 nguyen-virtual-machine systemd[1]: Starting Samba SMB Daemon...
Thg 6 13 22:05:24 nguyen-virtual-machine update-apparmor-samba-profile[3439]: grep: /etc/apparmor.d/samba/smbd-shares: No such file or directory
Thg 6 13 22:05:24 nguyen-virtual-machine update-apparmor-samba-profile[3442]: dtrf: /etc/apparmor.d/samba/smbd-shares: No such file or directory
Thg 6 13 22:05:24 nguyen-virtual-machine update-apparmor-samba-profile[3442]: Reloading updated AppArmor profile for Samba...
Thg 6 13 22:05:24 nguyen-virtual-machine systemd[1]: Started Samba SMB Daemon.
nguyen@nguyen-virtual-machine:~$ sudo systemctl status nmbd
● nmbd.service - Samba NMB Daemon
   Loaded: loaded (/lib/systemd/system/nmbd.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2024-06-13 22:05:24 +07; 38s ago
     Docs: man:nmbd(8)
          man:nmb(7)
          man:manpages(5)
 Main PID: 3435 (nmbd)
   Status: "nmbd: ready to serve connections..."
    Tasks: 1 (limit: 4555)
   Memory: 2.00M
      CPU: 2.00ms
     CGroup: /system.slice/nmbd.service
             └─3435 /usr/sbin/nmbd --foreground -no-process-group

Thg 6 13 22:05:24 nguyen-virtual-machine systemd[1]: Starting Samba NMB Daemon...
Thg 6 13 22:05:24 nguyen-virtual-machine systemd[1]: Started Samba NMB Daemon.
nguyen@nguyen-virtual-machine:~$
```

To direct input to this VM, move the mouse pointer inside or press Ctrl+G.

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