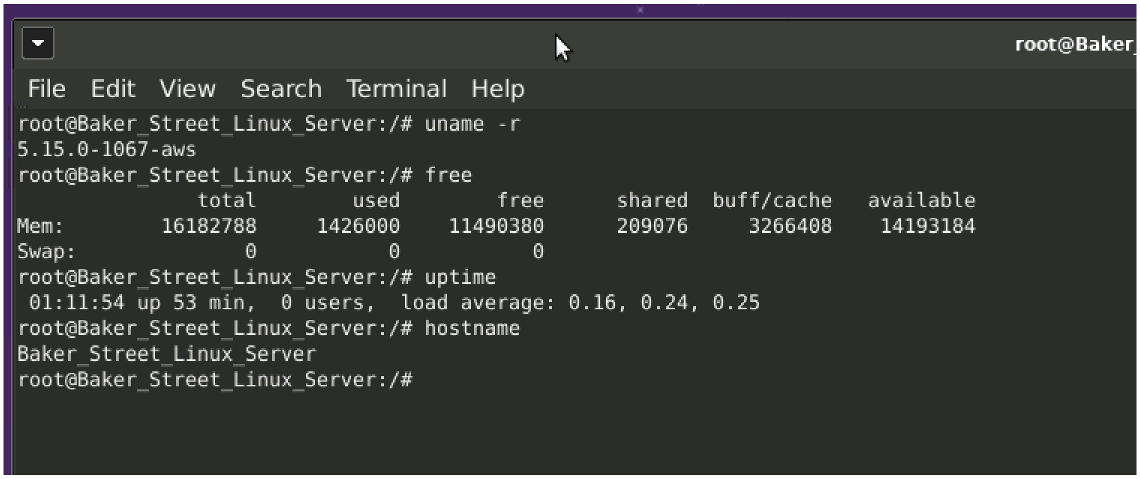
DAY ONE

Pre-Hardening Steps

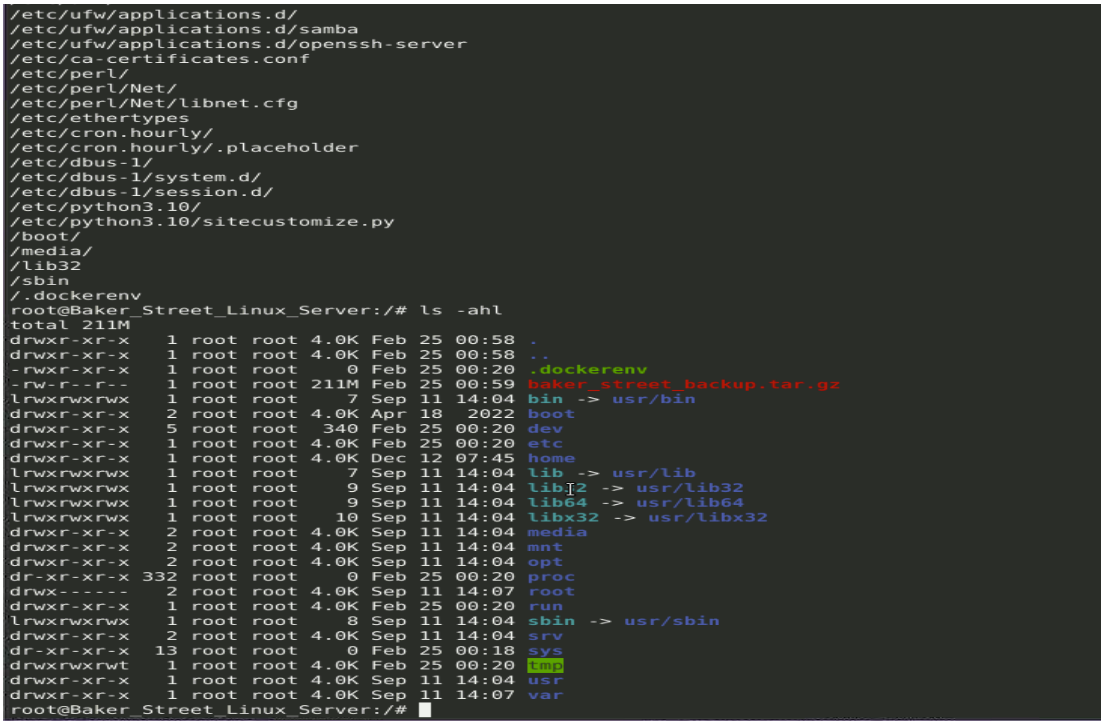
Day 1 Part 1: I ran the commands Hostname to see the host name. I ran uname – r to get the OS version. I ran the command free for the memory. Finally, I ran the uptime to show how long I have been in the terminal.



```
root@Baker_Street_Linux_Server:/# uname -r
5.15.0-1067-aws
root@Baker_Street_Linux_Server:/# free
               total        used        free      shared  buff/cache   available
Mem:        16182788     1426000    11490380      209076     3266408    14193184
Swap:              0           0           0
root@Baker_Street_Linux_Server:/# uptime
 01:11:54 up 53 min,  0 users,  load average: 0.16, 0.24, 0.25
root@Baker_Street_Linux_Server:/# hostname
Baker_Street_Linux_Server
root@Baker_Street_Linux_Server:/#
```

In Part 1, I ran the backup command given in the activity file to back up all files and directories. When it finished, I used the command ls—ahl to make sure the backup was completed. baker_street_backup. Tar.gz was listed in red, which let me know that the backup was completed.

- The command i used to backup the OS : -cvpzf /baker_street_backup.tar.gz –exclude=/baker_street_backup.tar.gz –exclude=/proc –-exclude=/tmp –exclude=/mnt –exclude=/sys –exclude=/dev –exclude=/run /

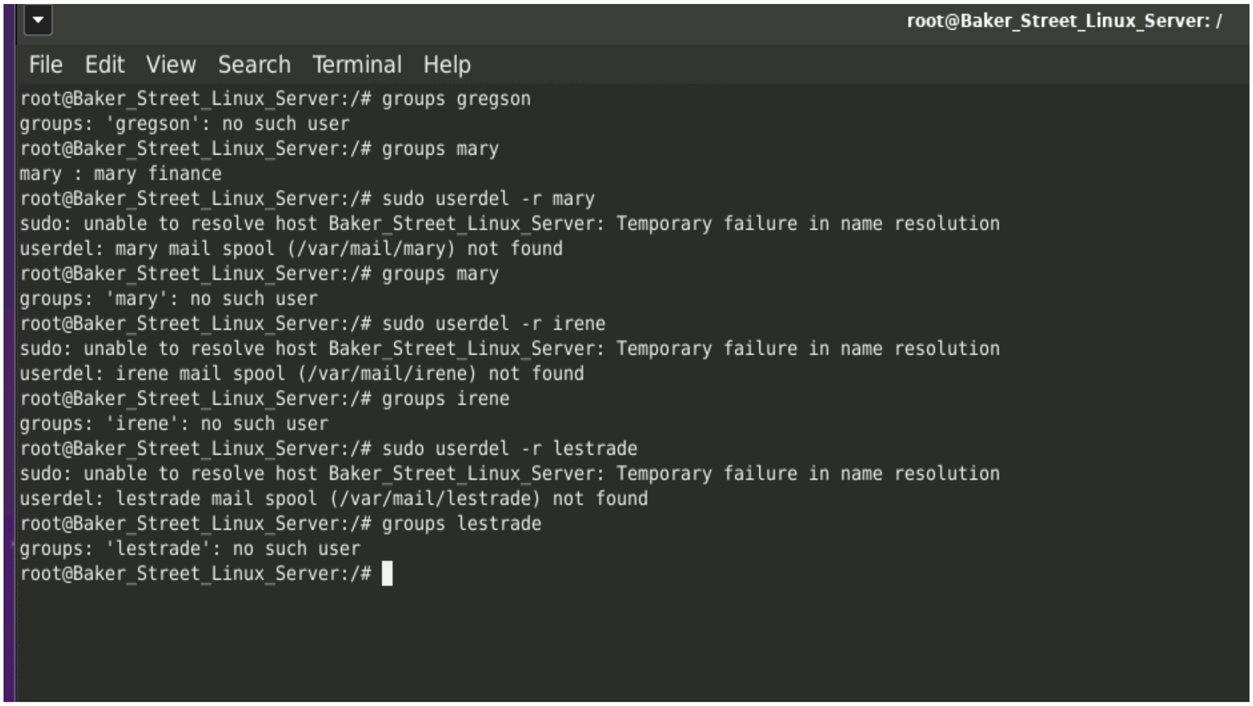


```
/etc/ufw/applications.d/
/etc/ufw/applications.d/samba
/etc/ufw/applications.d/openssh-server
/etc/ca-certificates.conf
/etc/perl/
/etc/perl/Net/
/etc/perl/Net/libnet.cfg
/etc/ethertypes
/etc/cron.hourly/
/etc/cron.hourly/.placeholder
/etc/dbus-1/
/etc/dbus-1/system.d/
/etc/dbus-1/session.d/
/etc/python3.10/
/etc/python3.10/sitecustomize.py
/boot/
/media/
/lib32
/sbin
/.dockerenv
root@Baker_Street_Linux_Server:/# ls -ahl
total 211M
drwxr-xr-x   1 root root 4.0K Feb 25 00:58 .
drwxr-xr-x   1 root root 4.0K Feb 25 00:58 ..
-rwxr-xr-x   1 root root    0 Feb 25 00:20 .dockerenv
-rw-r--r--   1 root root 211M Feb 25 00:59 baker_street_backup.tar.gz
lrwxrwxrwx   1 root root    7 Sep 11 14:04 bin -> usr/bin
drwxr-xr-x   2 root root 4.0K Apr 18  2022 boot
drwxr-xr-x   5 root root  340 Feb 25 00:20 dev
drwxr-xr-x   1 root root 4.0K Feb 25 00:20 etc
drwxr-xr-x   1 root root 4.0K Dec 12 07:45 home
lrwxrwxrwx   1 root root    7 Sep 11 14:04 lib -> usr/lib
lrwxrwxrwx   1 root root    9 Sep 11 14:04 lib32 -> usr/lib32
lrwxrwxrwx   1 root root    9 Sep 11 14:04 lib64 -> usr/lib64
lrwxrwxrwx   1 root root   10 Sep 11 14:04 libx32 -> usr/libx32
drwxr-xr-x   2 root root 4.0K Sep 11 14:04 media
drwxr-xr-x   2 root root 4.0K Sep 11 14:04 mnt
drwxr-xr-x   2 root root 4.0K Sep 11 14:04 opt
dr-xr-xr-x 332 root root    0 Feb 25 00:20 proc
drwx------   2 root root 4.0K Sep 11 14:07 root
drwxr-xr-x   1 root root 4.0K Feb 25 00:20 run
lrwxrwxrwx   1 root root    8 Sep 11 14:04 sbin -> usr/sbin
drwxr-xr-x   2 root root 4.0K Sep 11 14:04 srv
dr-xr-xr-x  13 root root    0 Feb 25 00:18 sys
drwxrwxrwt   1 root root 4.0K Feb 25 00:20 tmp
drwxr-xr-x   1 root root 4.0K Sep 11 14:04 usr
drwxr-xr-x   1 root root 4.0K Sep 11 14:07 var
root@Baker_Street_Linux_Server:/#
```

Auditing Users and Groups

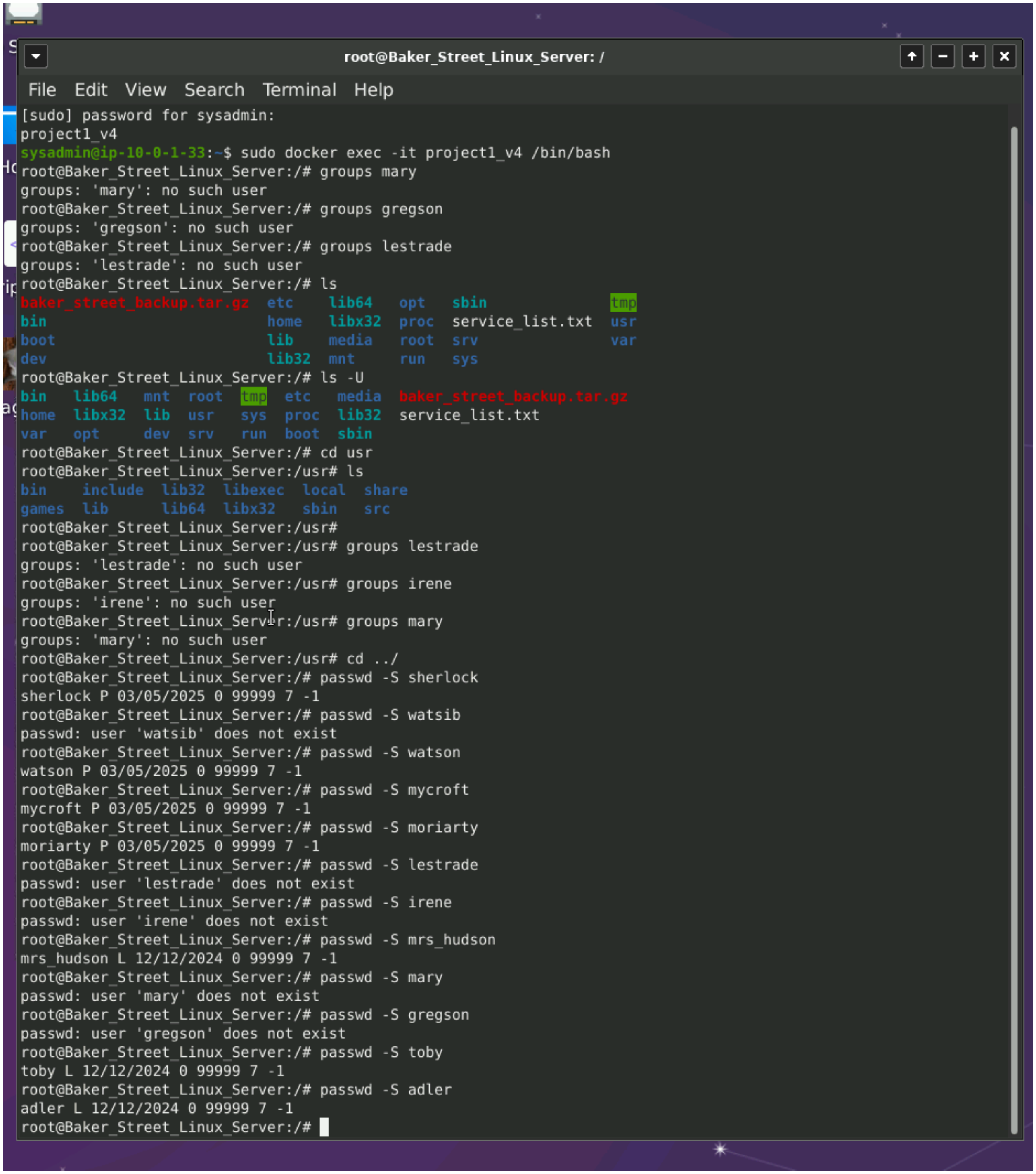
Part 2: I removed all the files and directories of all the employees who have been terminated, which are Mary, Gregson, Irene, and Lestrade. Then, I locked the employees' accounts on temporary leave, which were mrs_hudson and Moriarty. I then checked all the groups to make sure none of the employees was in the marketing department, which none of them were. I then checked the groups and went in and deleted the marketing group, which was closed earlier this year.

- When I deleted the user who had been terminated, I used the userdel -r (username) to make sure all the files and directories were deleted as well. To make sure the users were deleted, I ran the command groups with the names of terminated users Mary, Gregson, and Lestrade. (no need for me to use sudo if I'm using root, my apologies)


root@Baker_Street_Linux_Server: /
File Edit View Search Terminal Help

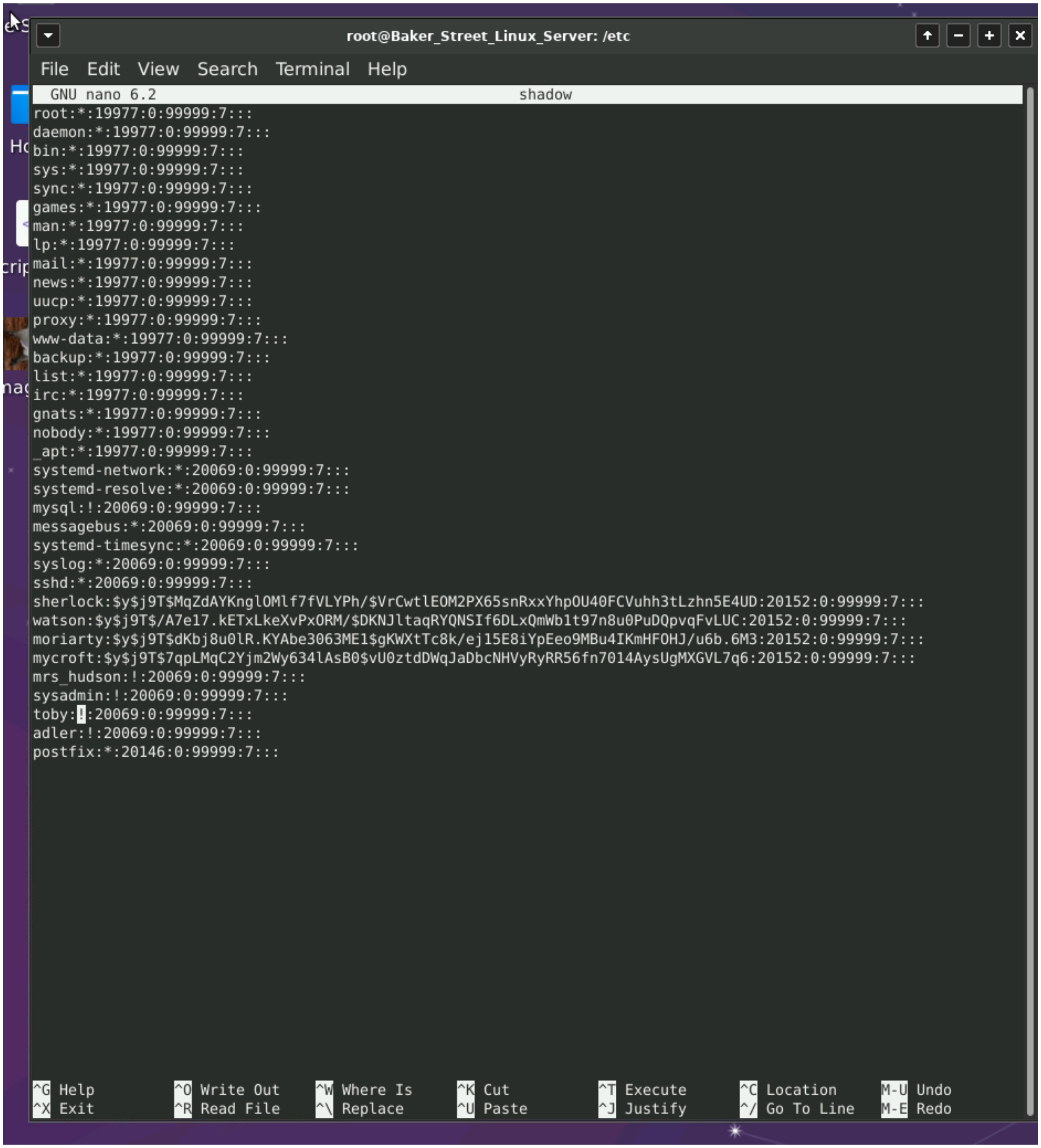
```
root@Baker_Street_Linux_Server:/# groups gregson
groups: 'gregson': no such user
root@Baker_Street_Linux_Server:/# groups mary
mary : mary finance
root@Baker_Street_Linux_Server:/# sudo userdel -r mary
sudo: unable to resolve host Baker_Street_Linux_Server: Temporary failure in name resolution
userdel: mary mail spool (/var/mail/mary) not found
root@Baker_Street_Linux_Server:/# groups mary
groups: 'mary': no such user
root@Baker_Street_Linux_Server:/# sudo userdel -r irene
sudo: unable to resolve host Baker_Street_Linux_Server: Temporary failure in name resolution
userdel: irene mail spool (/var/mail/irene) not found
root@Baker_Street_Linux_Server:/# groups irene
groups: 'irene': no such user
root@Baker_Street_Linux_Server:/# sudo userdel -r lestrade
sudo: unable to resolve host Baker_Street_Linux_Server: Temporary failure in name resolution
userdel: lestrade mail spool (/var/mail/lestrade) not found
root@Baker_Street_Linux_Server:/# groups lestrade
groups: 'lestrade': no such user
root@Baker_Street_Linux_Server:/# 
```

- I ran the command passwd -S (username) to check all the status of all employees listed. The terminated employees are shown below with “user doesn't exist” and we have two employees on the bottom that are locked out, which are Toby and Adler.
- The employees on temporary leave were Moriarty and mrs_hudson. I ran the command passwd -l (moriarty)(mrs_hudson) to lock their accounts. As you can see in the screenshot below, they have a L after I ran the command passwd -S (username) to show their account has been locked.

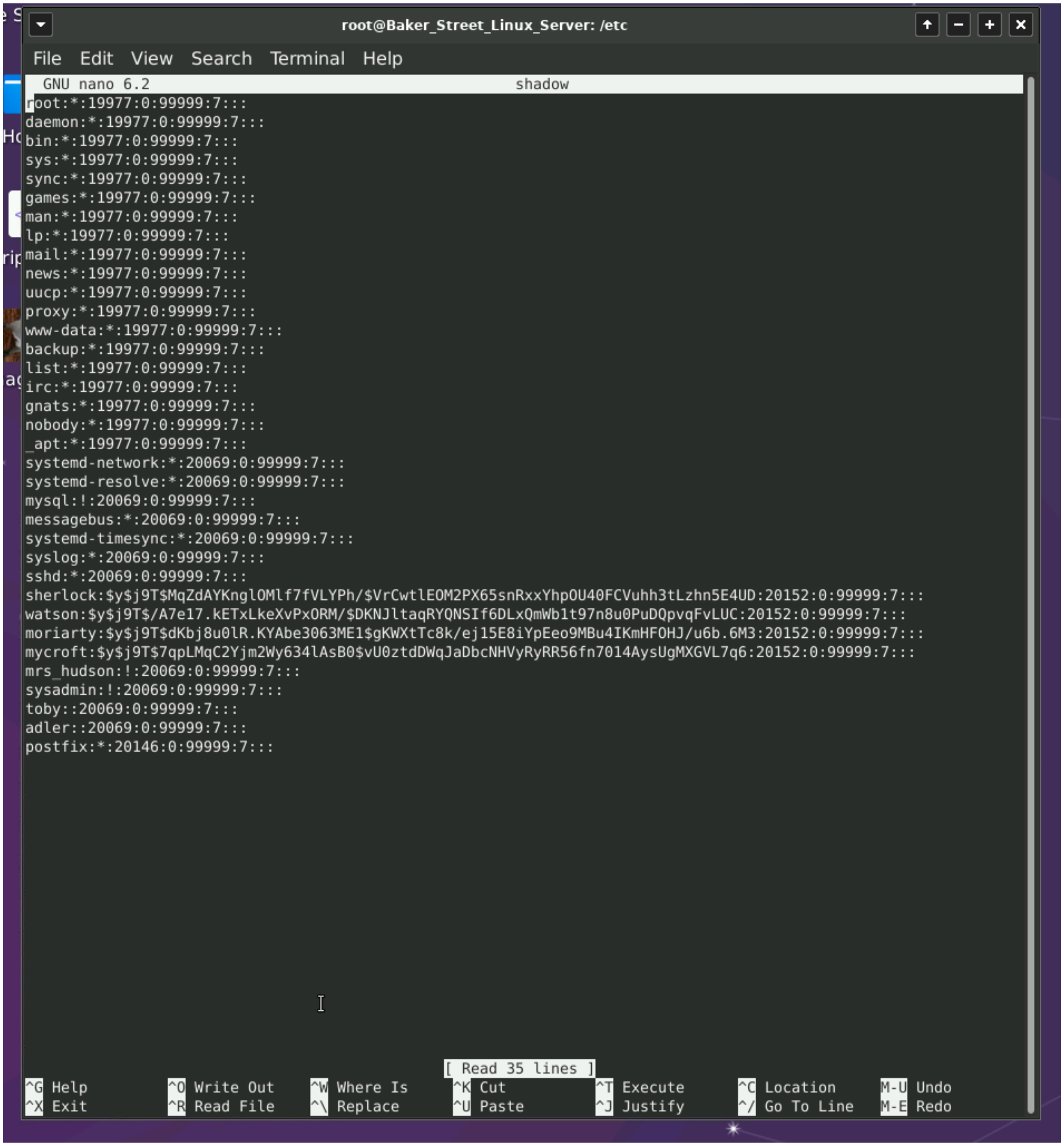

root@Baker_Street_Linux_Server: /
File Edit View Search Terminal Help

```
[sudo] password for sysadmin:
project1_v4
sysadmin@ip-10-0-1-33:~$ sudo docker exec -it project1_v4 /bin/bash
root@Baker_Street_Linux_Server:/# groups mary
groups: 'mary': no such user
root@Baker_Street_Linux_Server:/# groups gregson
groups: 'gregson': no such user
root@Baker_Street_Linux_Server:/# groups lestrade
groups: 'lestrade': no such user
root@Baker_Street_Linux_Server:/# ls
baker_street_backup.tar.gz  etc    lib64   opt   sbin              tmp
bin                         home   libx32  proc  service_list.txt  usr
boot                        lib    media   root  srv               var
dev                         lib32  mnt     run   sys
root@Baker_Street_Linux_Server:/# ls -U
bin   lib64   mnt  root  tmp  etc   media  baker_street_backup.tar.gz
home  libx32  lib  usr   sys  proc  lib32  service_list.txt
var   opt     dev  srv   run  boot  sbin
root@Baker_Street_Linux_Server:/# cd usr
root@Baker_Street_Linux_Server:/usr# ls
bin    include  lib32  libexec  local  share
games  lib      lib64  libx32   sbin   src
root@Baker_Street_Linux_Server:/usr#
root@Baker_Street_Linux_Server:/usr# groups lestrade
groups: 'lestrade': no such user
root@Baker_Street_Linux_Server:/usr# groups irene
groups: 'irene': no such user
root@Baker_Street_Linux_Server:/usr# groups mary
groups: 'mary': no such user
root@Baker_Street_Linux_Server:/usr# cd ../
root@Baker_Street_Linux_Server:/# passwd -S sherlock
sherlock P 03/05/2025 0 99999 7 -1
root@Baker_Street_Linux_Server:/# passwd -S watsib
passwd: user 'watsib' does not exist
root@Baker_Street_Linux_Server:/# passwd -S watson
watson P 03/05/2025 0 99999 7 -1
root@Baker_Street_Linux_Server:/# passwd -S mycroft
mycroft P 03/05/2025 0 99999 7 -1
root@Baker_Street_Linux_Server:/# passwd -S moriarty
moriarty P 03/05/2025 0 99999 7 -1
root@Baker_Street_Linux_Server:/# passwd -S lestrade
passwd: user 'lestrade' does not exist
root@Baker_Street_Linux_Server:/# passwd -S irene
passwd: user 'irene' does not exist
root@Baker_Street_Linux_Server:/# passwd -S mrs_hudson
mrs_hudson L 12/12/2024 0 99999 7 -1
root@Baker_Street_Linux_Server:/# passwd -S mary
passwd: user 'mary' does not exist
root@Baker_Street_Linux_Server:/# passwd -S gregson
passwd: user 'gregson' does not exist
root@Baker_Street_Linux_Server:/# passwd -S toby
toby L 12/12/2024 0 99999 7 -1
root@Baker_Street_Linux_Server:/# passwd -S adler
adler L 12/12/2024 0 99999 7 -1
root@Baker_Street_Linux_Server:/#
```

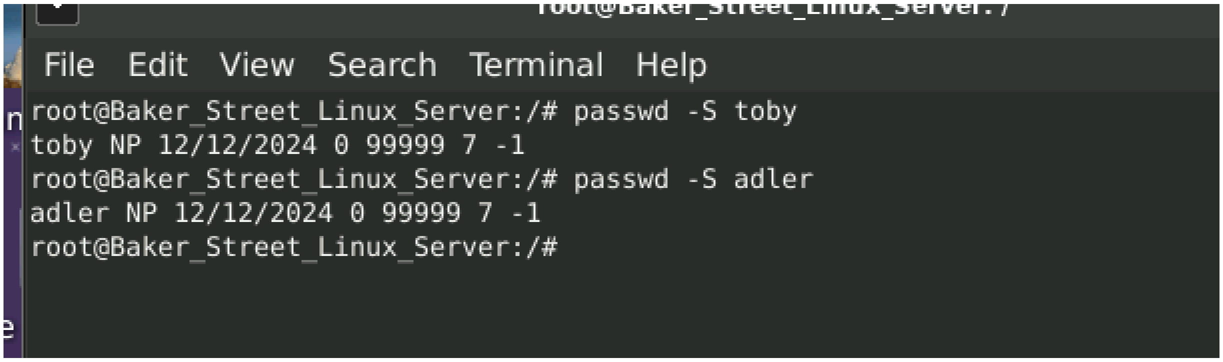
- I nano into /etc/shadow to remove the “!” by their hash to unlock the user account. With me deleting the “!” in their hash, they don't have a password. I ran the command passwd -S (toby and adler) and they have NP which means no password.



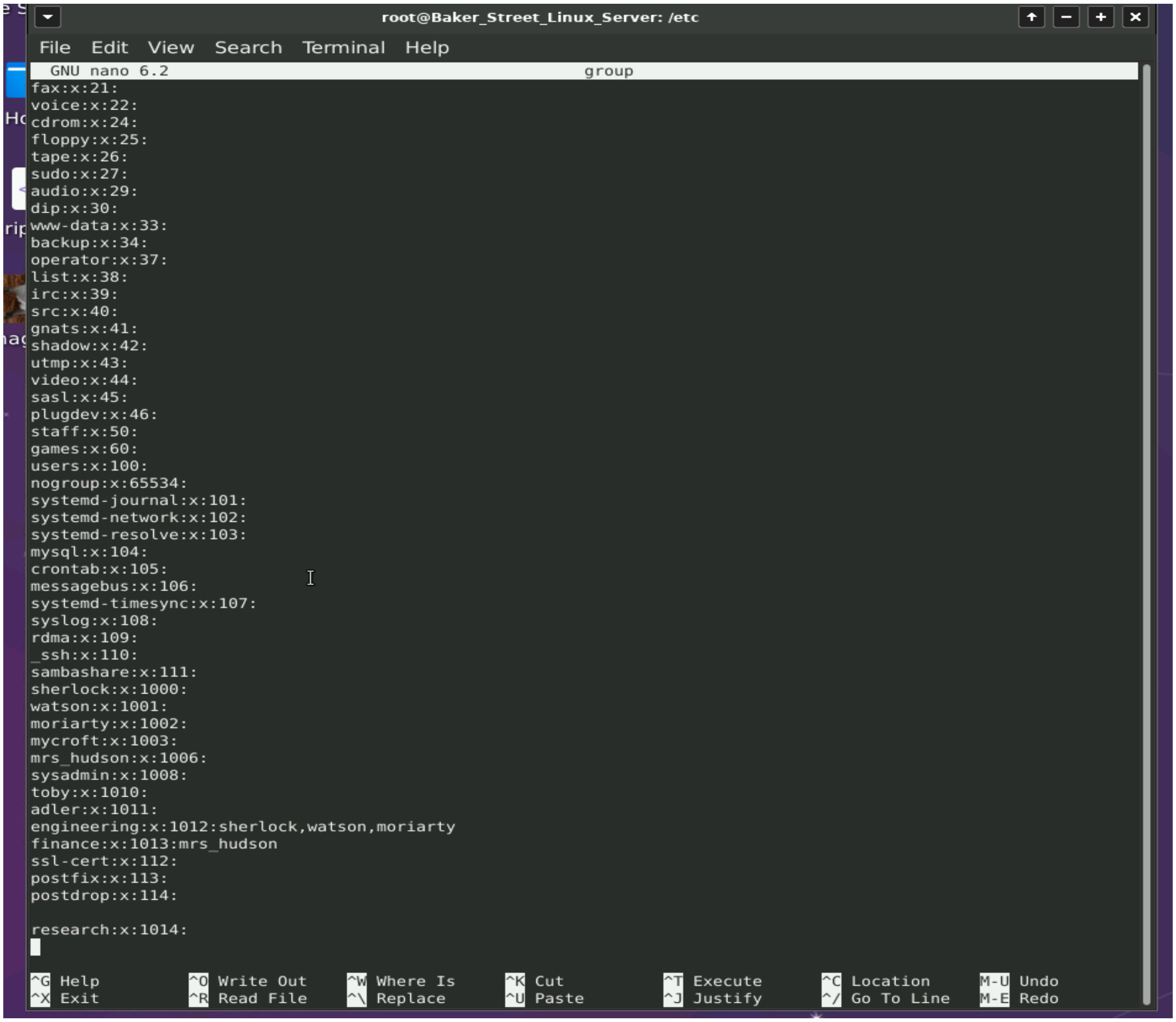
```
  GNU nano 6.2                                     shadow
root:*:19977:0:99999:7:::
daemon:*:19977:0:99999:7:::
bin:*:19977:0:99999:7:::
sys:*:19977:0:99999:7:::
sync:*:19977:0:99999:7:::
games:*:19977:0:99999:7:::
man:*:19977:0:99999:7:::
lp:*:19977:0:99999:7:::
mail:*:19977:0:99999:7:::
news:*:19977:0:99999:7:::
uucp:*:19977:0:99999:7:::
proxy:*:19977:0:99999:7:::
www-data:*:19977:0:99999:7:::
backup:*:19977:0:99999:7:::
list:*:19977:0:99999:7:::
irc:*:19977:0:99999:7:::
gnats:*:19977:0:99999:7:::
nobody:*:19977:0:99999:7:::
_apt:*:19977:0:99999:7:::
systemd-network:*:20069:0:99999:7:::
systemd-resolve:*:20069:0:99999:7:::
mysql:!:20069:0:99999:7:::
messagebus:*:20069:0:99999:7:::
systemd-timesync:*:20069:0:99999:7:::
syslog:*:20069:0:99999:7:::
sshd:*:20069:0:99999:7:::
sherlock:$y$j9T$MqZdAYKnglOMlf7fVLYPh/$VrCwtlEOM2PX65snRxxYhpOU40FCVuhh3tLzhn5E4UD:20152:0:99999:7:::
watson:$y$j9T$/A7e17.kETxLkeXvPxORM/$DKNJltaqRYQNSIf6DLxQmWb1t97n8u0PuDQpvqFvLUC:20152:0:99999:7:::
moriarty:$y$j9T$dKbj8u0lR.KYAbe3063ME1$gKWXtTc8k/ej15E8iYpEeo9MBu4IKmHFOHJ/u6b.6M3:20152:0:99999:7:::
mycroft:$y$j9T$7qpLMqC2Yjm2Wy634lAsB0$vU0ztdDWqJaDbcNHVyRyRR56fn7014AysUgMXGVL7q6:20152:0:99999:7:::
mrs_hudson:!:20069:0:99999:7:::
sysadmin:!:20069:0:99999:7:::
toby:!:20069:0:99999:7:::
adler:!:20069:0:99999:7:::
postfix:*:20146:0:99999:7:::















^G Help        ^O Write Out   ^W Where Is    ^K Cut         ^T Execute     ^C Location    M-U Undo
^X Exit        ^R Read File   ^\ Replace     ^U Paste       ^J Justify     ^/ Go To Line  M-E Redo
```



```
  GNU nano 6.2                                shadow
root:*:19977:0:99999:7:::
daemon:*:19977:0:99999:7:::
bin:*:19977:0:99999:7:::
sys:*:19977:0:99999:7:::
sync:*:19977:0:99999:7:::
games:*:19977:0:99999:7:::
man:*:19977:0:99999:7:::
lp:*:19977:0:99999:7:::
mail:*:19977:0:99999:7:::
news:*:19977:0:99999:7:::
uucp:*:19977:0:99999:7:::
proxy:*:19977:0:99999:7:::
www-data:*:19977:0:99999:7:::
backup:*:19977:0:99999:7:::
list:*:19977:0:99999:7:::
irc:*:19977:0:99999:7:::
gnats:*:19977:0:99999:7:::
nobody:*:19977:0:99999:7:::
_apt:*:19977:0:99999:7:::
systemd-network:*:20069:0:99999:7:::
systemd-resolve:*:20069:0:99999:7:::
mysql:!:20069:0:99999:7:::
messagebus:*:20069:0:99999:7:::
systemd-timesync:*:20069:0:99999:7:::
syslog:*:20069:0:99999:7:::
sshd:*:20069:0:99999:7:::
sherlock:$y$j9T$MqZdAYKnglOMlf7fVLYPh/$VrCwtlEOM2PX65snRxxYhpOU40FCVuhh3tLzhn5E4UD:20152:0:99999:7:::
watson:$y$j9T$/A7e17.kETxLkeXvPxORM/$DKNJltaqRYQNSIf6DLxQmWb1t97n8u0PuDQpvqFvLUC:20152:0:99999:7:::
moriarty:$y$j9T$dKbj8u0lR.KYAbe3063ME1$gKWXtTc8k/ej15E8iYpEeo9MBu4IKmHFOHJ/u6b.6M3:20152:0:99999:7:::
mycroft:$y$j9T$7qpLMqC2Yjm2Wy634lAsB0$vU0ztdDWqJaDbcNHVyRyRR56fn7014AysUgMXGVL7q6:20152:0:99999:7:::
mrs_hudson:!:20069:0:99999:7:::
sysadmin:!:20069:0:99999:7:::
toby::20069:0:99999:7:::
adler::20069:0:99999:7:::
postfix:*:20146:0:99999:7:::









                                          [ Read 35 lines ]
^G Help       ^O Write Out  ^W Where Is   ^K Cut        ^T Execute    ^C Location   M-U Undo
^X Exit       ^R Read File  ^\ Replace    ^U Paste      ^J Justify    ^/ Go To Line M-E Redo
```


root@Baker_Street_Linux_Server:/
File Edit View Search Terminal Help

```
root@Baker_Street_Linux_Server:/# passwd -S toby
toby NP 12/12/2024 0 99999 7 -1
root@Baker_Street_Linux_Server:/# passwd -S adler
adler NP 12/12/2024 0 99999 7 -1
root@Baker_Street_Linux_Server:/#
```


root@Baker_Street_Linux_Server: /etc
File Edit View Search Terminal Help
GNU nano 6.2 group

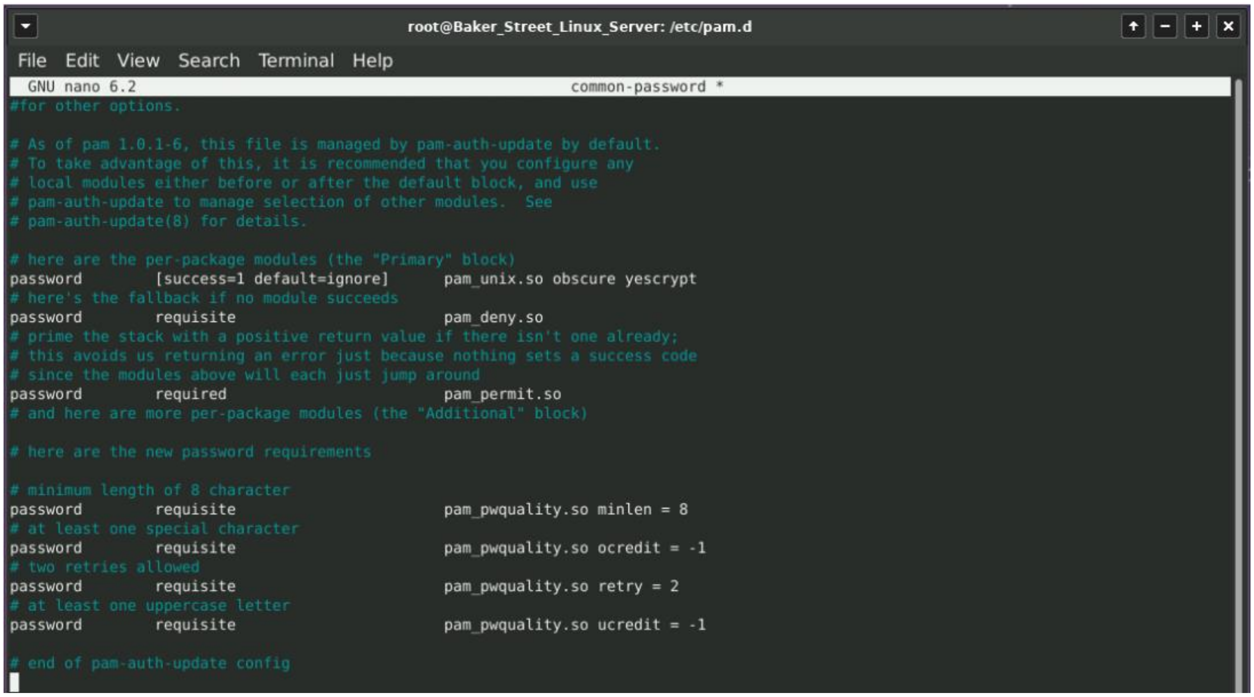
```
fax:x:21:
voice:x:22:
cdrom:x:24:
floppy:x:25:
tape:x:26:
sudo:x:27:
audio:x:29:
dip:x:30:
www-data:x:33:
backup:x:34:
operator:x:37:
list:x:38:
irc:x:39:
src:x:40:
gnats:x:41:
shadow:x:42:
utmp:x:43:
video:x:44:
sasl:x:45:
plugdev:x:46:
staff:x:50:
games:x:60:
users:x:100:
nogroup:x:65534:
systemd-journal:x:101:
systemd-network:x:102:
systemd-resolve:x:103:
mysql:x:104:
crontab:x:105:
messagebus:x:106:
systemd-timesync:x:107:
syslog:x:108:
rdma:x:109:
_ssh:x:110:
sambashare:x:111:
sherlock:x:1000:
watson:x:1001:
moriarty:x:1002:
mycroft:x:1003:
mrs_hudson:x:1006:
sysadmin:x:1008:
toby:x:1010:
adler:x:1011:
engineering:x:1012:sherlock,watson,moriarty
finance:x:1013:mrs_hudson
ssl-cert:x:112:
postfix:x:113:
postdrop:x:114:

research:x:1014:
```

- I nano into /etc/group to see if there is a marketing department and there is not one. I created the research group.

Updating and Enforcing Password Policies

Part 3: I ran nano /etc/pam.d/common-password to edit this file. While in the file, I added a comment saying here are the new password requirements.

- So, I added the new available settings of the new password requirements, which were minlen=8, ocredit=-1, retry=2, ucredit= -1. The screenshot will provide evidence of how it was entered into the file.

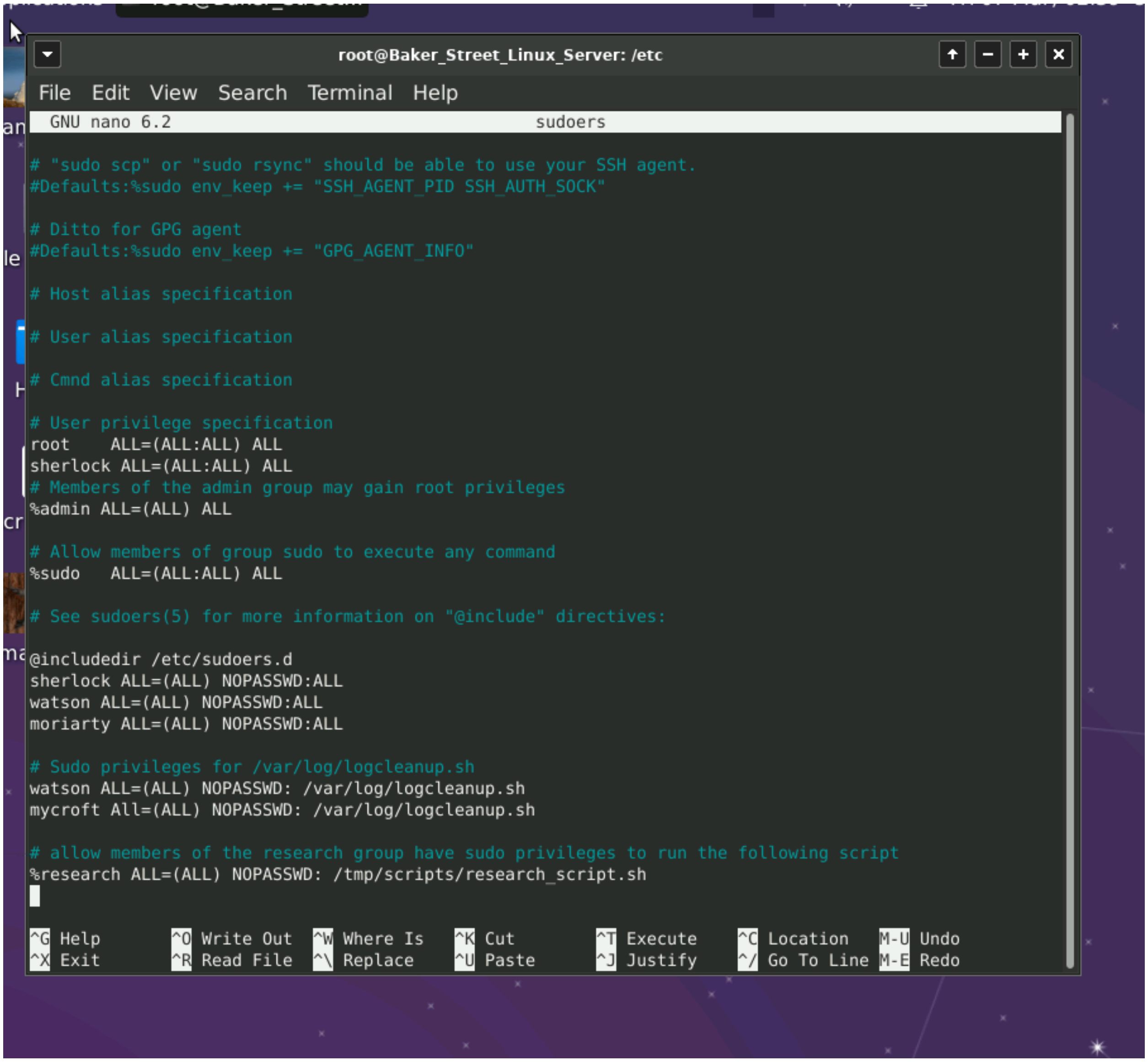

root@Baker_Street_Linux_Server: /etc/pam.d
File Edit View Search Terminal Help

```
  GNU nano 6.2                                          common-password *
#for other options.

# As of pam 1.0.1-6, this file is managed by pam-auth-update by default.
# To take advantage of this, it is recommended that you configure any
# local modules either before or after the default block, and use
# pam-auth-update to manage selection of other modules.  See
# pam-auth-update(8) for details.

# here are the per-package modules (the "Primary" block)
password        [success=1 default=ignore]      pam_unix.so obscure yescrypt
# here's the fallback if no module succeeds
password        requisite                       pam_deny.so
# prime the stack with a positive return value if there isn't one already;
# this avoids us returning an error just because nothing sets a success code
# since the modules above will each just jump around
password        required                        pam_permit.so
# and here are more per-package modules (the "Additional" block)

# here are the new password requirements

# minimum length of 8 character
password        requisite                       pam_pwquality.so minlen = 8
# at least one special character
password        requisite                       pam_pwquality.so ocredit = -1
# two retries allowed
password        requisite                       pam_pwquality.so retry = 2
# at least one uppercase letter
password        requisite                       pam_pwquality.so ucredit = -1

# end of pam-auth-update config
```

Updating and Enforcing sudo Permissions

Part 4: all evidence is provided below in the screenshot.

- I nano into /etc/sudoers to make changes to this file. The first change was giving Sherlock full sudo permissions.
- I then gave Watson and Mycroft sudo privileges to run the following script /var/log/logcleanup.sh
- I gave all the employees in the research group sudo privileges to run /tmp/scripts/research_script.sh.

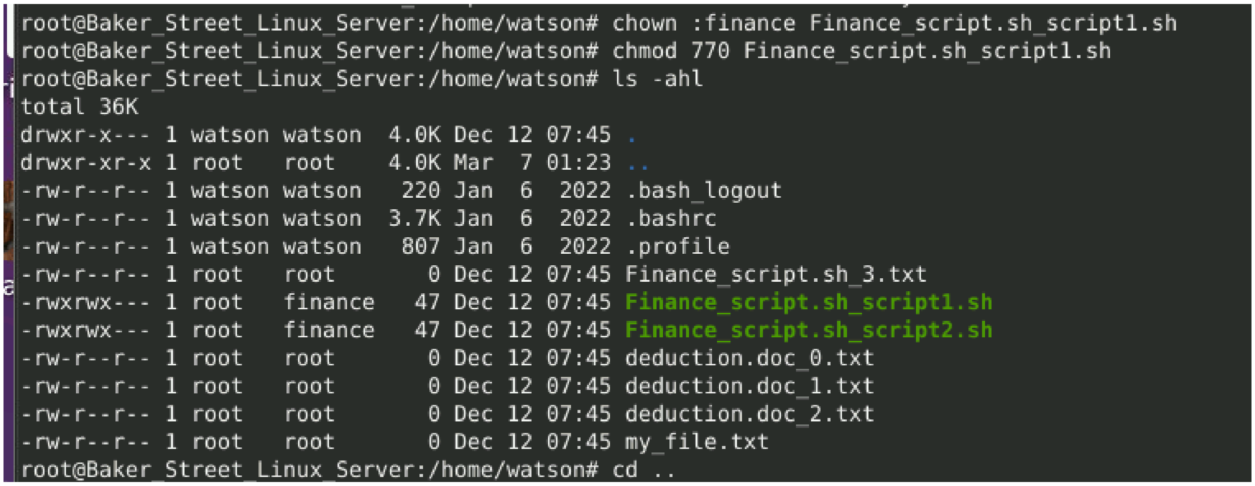


```
  GNU nano 6.2                                 sudoers

# "sudo scp" or "sudo rsync" should be able to use your SSH agent.
#Defaults:%sudo env_keep += "SSH_AGENT_PID SSH_AUTH_SOCK"

# Ditto for GPG agent
#Defaults:%sudo env_keep += "GPG_AGENT_INFO"

# Host alias specification

# User alias specification

# Cmnd alias specification

# User privilege specification
root    ALL=(ALL:ALL) ALL
sherlock ALL=(ALL:ALL) ALL
# Members of the admin group may gain root privileges
%admin ALL=(ALL) ALL

# Allow members of group sudo to execute any command
%sudo   ALL=(ALL:ALL) ALL

# See sudoers(5) for more information on "@include" directives:

@includedir /etc/sudoers.d
sherlock ALL=(ALL) NOPASSWD:ALL
watson ALL=(ALL) NOPASSWD:ALL
moriarty ALL=(ALL) NOPASSWD:ALL

# Sudo privileges for /var/log/logcleanup.sh
watson ALL=(ALL) NOPASSWD: /var/log/logcleanup.sh
mycroft All=(ALL) NOPASSWD: /var/log/logcleanup.sh

# allow members of the research group have sudo privileges to run the following script
%research ALL=(ALL) NOPASSWD: /tmp/scripts/research_script.sh

^G Help       ^O Write Out  ^W Where Is   ^K Cut        ^T Execute    ^C Location   M-U Undo
^X Exit       ^R Read File  ^\ Replace    ^U Paste      ^J Justify    ^/ Go To Line M-E Redo
```

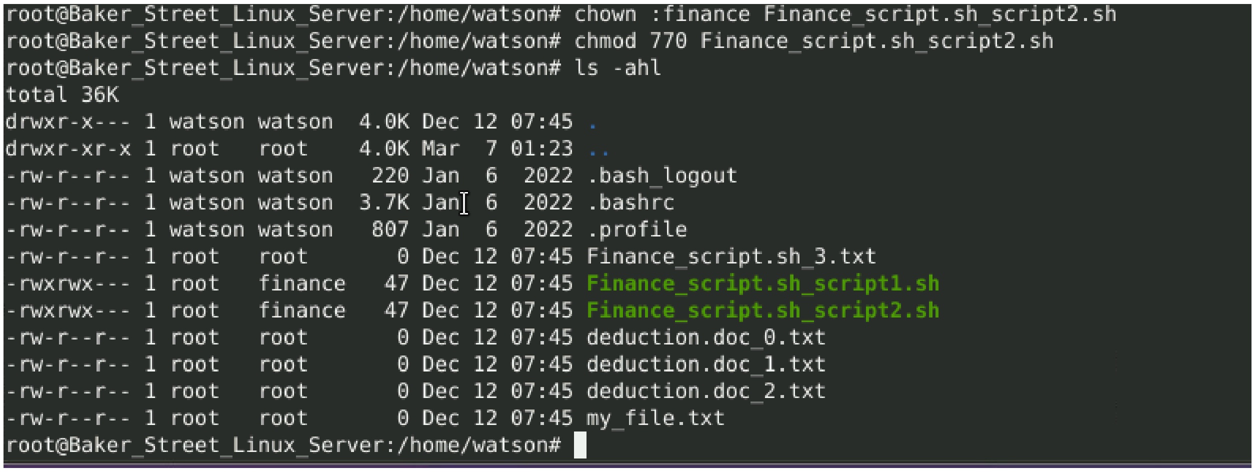
Updating Permissions on Files and Directories

Part 5:

- I went to the home directory, ran the ls command to see all the users/employees. I would change the directory into one of the user/employee and use the ls -ahl command to get a long listing of everything in their directory.
    - I found certain scripts in certain user groups that they were not a part of. I had to change the ownership (chown) and change the permissions to make sure the right people had the right access to those scripts.
    - I went to watson home directory and ran the ls -ahl command to see the full listing. I saw he had the finance_script.sh_script1&2.sh listed.

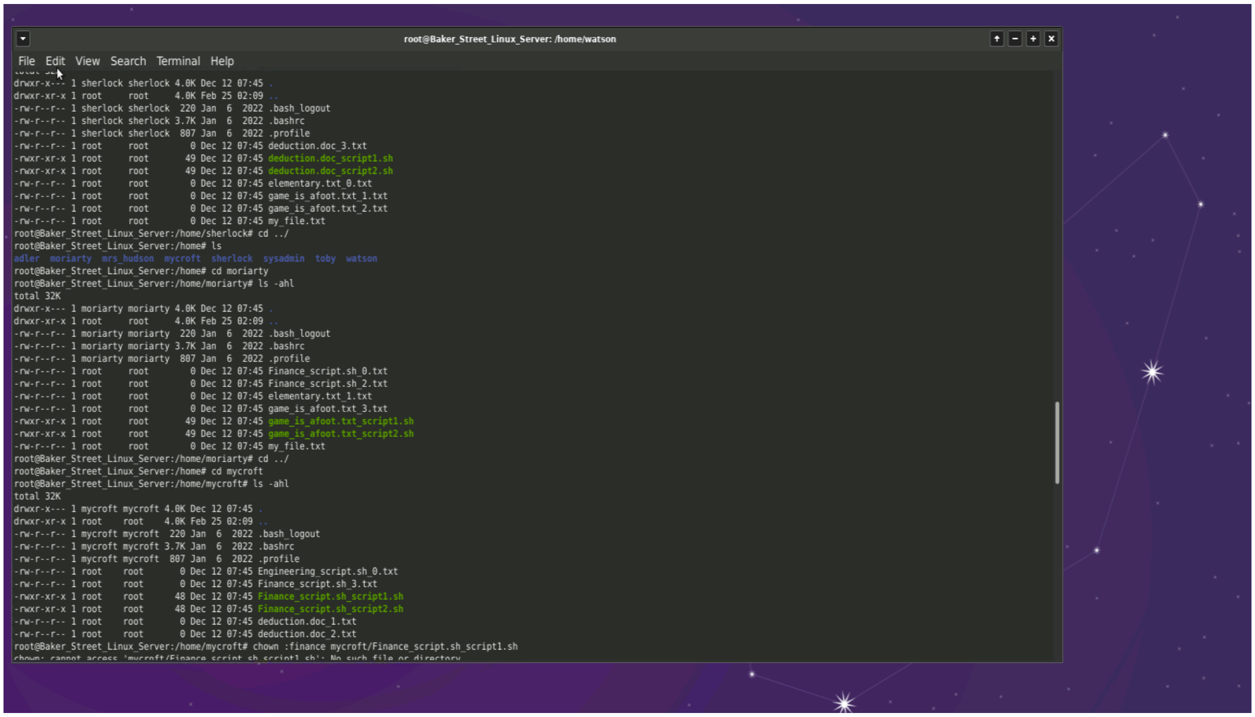


```
root@Baker_Street_Linux_Server:/home/watson# chown :finance Finance_script.sh_script1.sh
root@Baker_Street_Linux_Server:/home/watson# chmod 770 Finance_script.sh_script1.sh
root@Baker_Street_Linux_Server:/home/watson# ls -ahl
total 36K
drwxr-x--- 1 watson watson  4.0K Dec 12 07:45 .
drwxr-xr-x 1 root   root    4.0K Mar  7 01:23 ..
-rw-r--r-- 1 watson watson   220 Jan  6  2022 .bash_logout
-rw-r--r-- 1 watson watson  3.7K Jan  6  2022 .bashrc
-rw-r--r-- 1 watson watson   807 Jan  6  2022 .profile
-rw-r--r-- 1 root   root       0 Dec 12 07:45 Finance_script.sh_3.txt
-rwxrwx--- 1 root   finance   47 Dec 12 07:45 Finance_script.sh_script1.sh
-rwxrwx--- 1 root   finance   47 Dec 12 07:45 Finance_script.sh_script2.sh
-rw-r--r-- 1 root   root       0 Dec 12 07:45 deduction.doc_0.txt
-rw-r--r-- 1 root   root       0 Dec 12 07:45 deduction.doc_1.txt
-rw-r--r-- 1 root   root       0 Dec 12 07:45 deduction.doc_2.txt
-rw-r--r-- 1 root   root       0 Dec 12 07:45 my_file.txt
root@Baker_Street_Linux_Server:/home/watson# cd ..
```

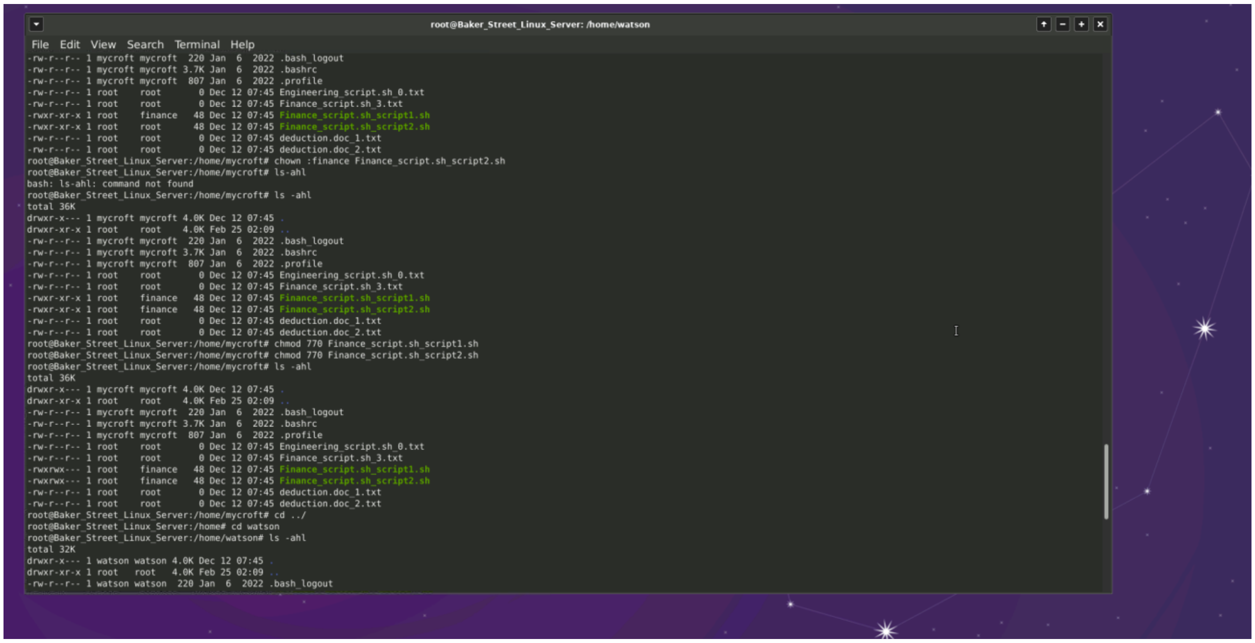


```
root@Baker_Street_Linux_Server:/home/watson# chown :finance Finance_script.sh_script2.sh
root@Baker_Street_Linux_Server:/home/watson# chmod 770 Finance_script.sh_script2.sh
root@Baker_Street_Linux_Server:/home/watson# ls -ahl
total 36K
drwxr-x--- 1 watson watson  4.0K Dec 12 07:45 .
drwxr-xr-x 1 root   root    4.0K Mar  7 01:23 ..
-rw-r--r-- 1 watson watson   220 Jan  6  2022 .bash_logout
-rw-r--r-- 1 watson watson  3.7K Jan  6  2022 .bashrc
-rw-r--r-- 1 watson watson   807 Jan  6  2022 .profile
-rw-r--r-- 1 root   root       0 Dec 12 07:45 Finance_script.sh_3.txt
-rwxrwx--- 1 root   finance   47 Dec 12 07:45 Finance_script.sh_script1.sh
-rwxrwx--- 1 root   finance   47 Dec 12 07:45 Finance_script.sh_script2.sh
-rw-r--r-- 1 root   root       0 Dec 12 07:45 deduction.doc_0.txt
-rw-r--r-- 1 root   root       0 Dec 12 07:45 deduction.doc_1.txt
-rw-r--r-- 1 root   root       0 Dec 12 07:45 deduction.doc_2.txt
-rw-r--r-- 1 root   root       0 Dec 12 07:45 my_file.txt
root@Baker_Street_Linux_Server:/home/watson#
```

        - I changed ownership (chown) to the finance group (I used the command chown :finance Finance_script.sh_script1.sh). Used the same command for the second script.
        - I then had to change the permissions (chmod) to 770 to read, write, execute so all members of the finance group can read, write, execute. Command used (chmod 770 Finance_script.sh_script1.sh. I did the same thing for the second script as well.



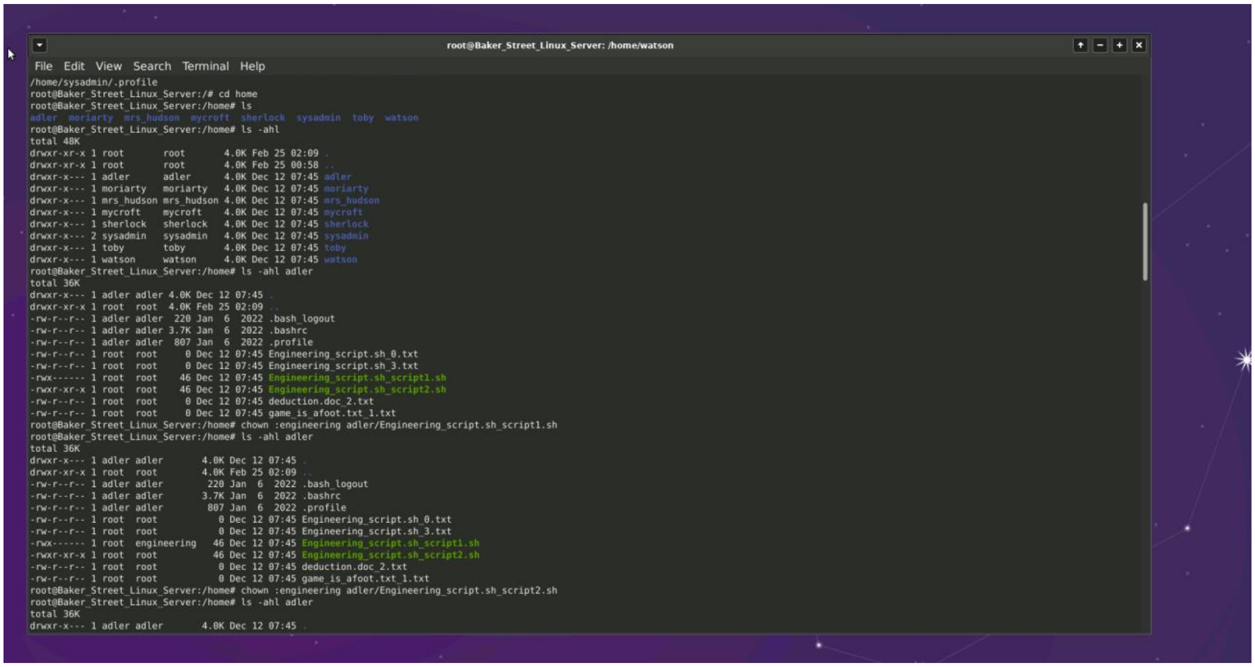
```
total 32K
drwxr-x--- 1 sherlock sherlock 4.0K Dec 12 07:45 .
drwxr-xr-x 1 root     root     4.0K Feb 25 02:09 ..
-rw-r--r-- 1 sherlock sherlock  220 Jan  6  2022 .bash_logout
-rw-r--r-- 1 sherlock sherlock 3.7K Jan  6  2022 .bashrc
-rw-r--r-- 1 sherlock sherlock  807 Jan  6  2022 .profile
-rw-r--r-- 1 root     root        0 Dec 12 07:45 deduction.doc_3.txt
-rwxr-xr-x 1 root     root       49 Dec 12 07:45 deduction.doc_script1.sh
-rwxr-xr-x 1 root     root       49 Dec 12 07:45 deduction.doc_script2.sh
-rw-r--r-- 1 root     root        0 Dec 12 07:45 elementary.txt_0.txt
-rw-r--r-- 1 root     root        0 Dec 12 07:45 game_is_afoot.txt_1.txt
-rw-r--r-- 1 root     root        0 Dec 12 07:45 game_is_afoot.txt_2.txt
-rw-r--r-- 1 root     root        0 Dec 12 07:45 my_file.txt
root@Baker_Street_Linux_Server:/home/sherlock# cd ../
root@Baker_Street_Linux_Server:/home# ls
adler  moriarty  mrs_hudson  mycroft  sherlock  sysadmin  toby  watson
root@Baker_Street_Linux_Server:/home# cd moriarty
root@Baker_Street_Linux_Server:/home/moriarty# ls -ahl
total 32K
drwxr-x--- 1 moriarty moriarty 4.0K Dec 12 07:45 .
drwxr-xr-x 1 root     root     4.0K Feb 25 02:09 ..
-rw-r--r-- 1 moriarty moriarty  220 Jan  6  2022 .bash_logout
-rw-r--r-- 1 moriarty moriarty 3.7K Jan  6  2022 .bashrc
-rw-r--r-- 1 moriarty moriarty  807 Jan  6  2022 .profile
-rw-r--r-- 1 root     root        0 Dec 12 07:45 Finance_script.sh_0.txt
-rw-r--r-- 1 root     root        0 Dec 12 07:45 Finance_script.sh_2.txt
-rw-r--r-- 1 root     root        0 Dec 12 07:45 elementary.txt_1.txt
-rw-r--r-- 1 root     root        0 Dec 12 07:45 game_is_afoot.txt_3.txt
-rwxr-xr-x 1 root     root       49 Dec 12 07:45 game_is_afoot.txt_script1.sh
-rwxr-xr-x 1 root     root       49 Dec 12 07:45 game_is_afoot.txt_script2.sh
-rw-r--r-- 1 root     root        0 Dec 12 07:45 my_file.txt
root@Baker_Street_Linux_Server:/home/moriarty# cd ../
root@Baker_Street_Linux_Server:/home# cd mycroft
root@Baker_Street_Linux_Server:/home/mycroft# ls -ahl
total 32K
drwxr-x--- 1 mycroft mycroft 4.0K Dec 12 07:45 .
drwxr-xr-x 1 root    root    4.0K Feb 25 02:09 ..
-rw-r--r-- 1 mycroft mycroft  220 Jan  6  2022 .bash_logout
-rw-r--r-- 1 mycroft mycroft 3.7K Jan  6  2022 .bashrc
-rw-r--r-- 1 mycroft mycroft  807 Jan  6  2022 .profile
-rw-r--r-- 1 root    root       0 Dec 12 07:45 Engineering_script.sh_0.txt
-rw-r--r-- 1 root    root       0 Dec 12 07:45 Finance_script.sh_3.txt
-rwxr-xr-x 1 root    root      48 Dec 12 07:45 Finance_script.sh_script1.sh
-rwxr-xr-x 1 root    root      48 Dec 12 07:45 Finance_script.sh_script2.sh
-rw-r--r-- 1 root    root       0 Dec 12 07:45 deduction.doc_1.txt
-rw-r--r-- 1 root    root       0 Dec 12 07:45 deduction.doc_2.txt
root@Baker_Street_Linux_Server:/home/mycroft# chown :finance mycroft/Finance_script.sh_script1.sh
chown: cannot access 'mycroft/Finance_script.sh_script1.sh': No such file or directory
```



```
-rw-r--r-- 1 mycroft mycroft  220 Jan  6  2022 .bash_logout
-rw-r--r-- 1 mycroft mycroft 3.7K Jan  6  2022 .bashrc
-rw-r--r-- 1 mycroft mycroft  807 Jan  6  2022 .profile
-rw-r--r-- 1 root    root       0 Dec 12 07:45 Engineering_script.sh_0.txt
-rw-r--r-- 1 root    root       0 Dec 12 07:45 Finance_script.sh_3.txt
-rwxr-xr-x 1 root    finance   48 Dec 12 07:45 Finance_script.sh_script1.sh
-rwxr-xr-x 1 root    root      48 Dec 12 07:45 Finance_script.sh_script2.sh
-rw-r--r-- 1 root    root       0 Dec 12 07:45 deduction.doc_1.txt
-rw-r--r-- 1 root    root       0 Dec 12 07:45 deduction.doc_2.txt
root@Baker_Street_Linux_Server:/home/mycroft# chown :finance Finance_script.sh_script2.sh
root@Baker_Street_Linux_Server:/home/mycroft# ls-ahl
bash: ls-ahl: command not found
root@Baker_Street_Linux_Server:/home/mycroft# ls -ahl
total 36K
drwxr-x--- 1 mycroft mycroft 4.0K Dec 12 07:45 .
drwxr-xr-x 1 root    root    4.0K Feb 25 02:09 ..
-rw-r--r-- 1 mycroft mycroft  220 Jan  6  2022 .bash_logout
-rw-r--r-- 1 mycroft mycroft 3.7K Jan  6  2022 .bashrc
-rw-r--r-- 1 mycroft mycroft  807 Jan  6  2022 .profile
-rw-r--r-- 1 root    root       0 Dec 12 07:45 Engineering_script.sh_0.txt
-rw-r--r-- 1 root    root       0 Dec 12 07:45 Finance_script.sh_3.txt
-rwxr-xr-x 1 root    finance   48 Dec 12 07:45 Finance_script.sh_script1.sh
-rwxr-xr-x 1 root    finance   48 Dec 12 07:45 Finance_script.sh_script2.sh
-rw-r--r-- 1 root    root       0 Dec 12 07:45 deduction.doc_1.txt
-rw-r--r-- 1 root    root       0 Dec 12 07:45 deduction.doc_2.txt
root@Baker_Street_Linux_Server:/home/mycroft# chmod 770 Finance_script.sh_script1.sh
root@Baker_Street_Linux_Server:/home/mycroft# chmod 770 Finance_script.sh_script2.sh
root@Baker_Street_Linux_Server:/home/mycroft# ls -ahl
total 36K
drwxr-x--- 1 mycroft mycroft 4.0K Dec 12 07:45 .
drwxr-xr-x 1 root    root    4.0K Feb 25 02:09 ..
-rw-r--r-- 1 mycroft mycroft  220 Jan  6  2022 .bash_logout
-rw-r--r-- 1 mycroft mycroft 3.7K Jan  6  2022 .bashrc
-rw-r--r-- 1 mycroft mycroft  807 Jan  6  2022 .profile
-rw-r--r-- 1 root    root       0 Dec 12 07:45 Engineering_script.sh_0.txt
-rw-r--r-- 1 root    root       0 Dec 12 07:45 Finance_script.sh_3.txt
-rwxrwx--- 1 root    finance   48 Dec 12 07:45 Finance_script.sh_script1.sh
-rwxrwx--- 1 root    finance   48 Dec 12 07:45 Finance_script.sh_script2.sh
-rw-r--r-- 1 root    root       0 Dec 12 07:45 deduction.doc_1.txt
-rw-r--r-- 1 root    root       0 Dec 12 07:45 deduction.doc_2.txt
root@Baker_Street_Linux_Server:/home/mycroft# cd ../
root@Baker_Street_Linux_Server:/home# cd watson
root@Baker_Street_Linux_Server:/home/watson# ls -ahl
total 32K
drwxr-x--- 1 watson watson 4.0K Dec 12 07:45 .
drwxr-xr-x 1 root   root   4.0K Feb 25 02:09 ..
-rw-r--r-- 1 watson watson  220 Jan  6  2022 .bash_logout
```

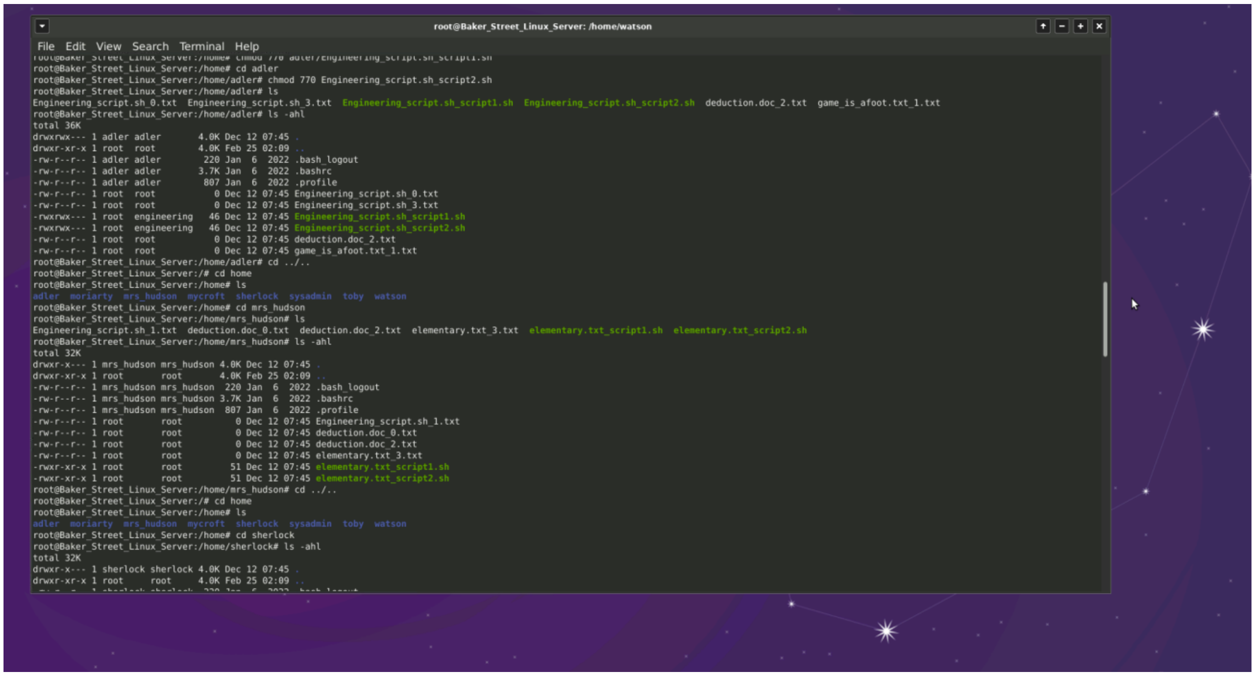
- I, cd into the adler directory ran the command ls -ahl to see the permissions and files and directories. I saw he had a script in there called Engineering_script.sh_script1.sh and script2.sh. I then used the command chown and chmod to change the permissions and change ownership.
    - The command I used was chown :engineering Engineering_script.sh_script.sh1. I did the same thing for script2.sh
    - Next command was chmod 770 Engineering_script.sh_script1.sh i did the same thing for script2.sh

- These commands allowed people in the engineering group to read, write, and execute the scripts if they are assigned to these groups.



root@Baker_Street_Linux_Server: /home/watson
File Edit View Search Terminal Help

```
/home/sysadmin/.profile
root@Baker_Street_Linux_Server:/# cd home
root@Baker_Street_Linux_Server:/home# ls
adler  moriarty  mrs_hudson  mycroft  sherlock  sysadmin  toby  watson
root@Baker_Street_Linux_Server:/home# ls -ahl
total 48K
drwxr-xr-x 1 root       root       4.0K Feb 25 02:09 .
drwxr-xr-x 1 root       root       4.0K Feb 25 00:58 ..
drwxr-x--- 1 adler      adler      4.0K Dec 12 07:45 adler
drwxr-x--- 1 moriarty   moriarty   4.0K Dec 12 07:45 moriarty
drwxr-x--- 1 mrs_hudson mrs_hudson 4.0K Dec 12 07:45 mrs_hudson
drwxr-x--- 1 mycroft    mycroft    4.0K Dec 12 07:45 mycroft
drwxr-x--- 1 sherlock   sherlock   4.0K Dec 12 07:45 sherlock
drwxr-x--- 2 sysadmin   sysadmin   4.0K Dec 12 07:45 sysadmin
drwxr-x--- 1 toby       toby       4.0K Dec 12 07:45 toby
drwxr-x--- 1 watson     watson     4.0K Dec 12 07:45 watson
root@Baker_Street_Linux_Server:/home# ls -ahl adler
total 36K
drwxr-x--- 1 adler adler 4.0K Dec 12 07:45 .
drwxr-xr-x 1 root  root  4.0K Feb 25 02:09 ..
-rw-r--r-- 1 adler adler  220 Jan  6  2022 .bash_logout
-rw-r--r-- 1 adler adler 3.7K Jan  6  2022 .bashrc
-rw-r--r-- 1 adler adler  807 Jan  6  2022 .profile
-rw-r--r-- 1 root  root     0 Dec 12 07:45 Engineering_script.sh_0.txt
-rw-r--r-- 1 root  root     0 Dec 12 07:45 Engineering_script.sh_3.txt
-rwx------ 1 root  root    46 Dec 12 07:45 Engineering_script.sh_script1.sh
-rwxr-xr-x 1 root  root    46 Dec 12 07:45 Engineering_script.sh_script2.sh
-rw-r--r-- 1 root  root     0 Dec 12 07:45 deduction.doc_2.txt
-rw-r--r-- 1 root  root     0 Dec 12 07:45 game_is_afoot.txt_1.txt
root@Baker_Street_Linux_Server:/home# chown :engineering adler/Engineering_script.sh_script1.sh
root@Baker_Street_Linux_Server:/home# ls -ahl adler
total 36K
drwxr-x--- 1 adler adler       4.0K Dec 12 07:45 .
drwxr-xr-x 1 root  root        4.0K Feb 25 02:09 ..
-rw-r--r-- 1 adler adler        220 Jan  6  2022 .bash_logout
-rw-r--r-- 1 adler adler       3.7K Jan  6  2022 .bashrc
-rw-r--r-- 1 adler adler        807 Jan  6  2022 .profile
-rw-r--r-- 1 root  root           0 Dec 12 07:45 Engineering_script.sh_0.txt
-rw-r--r-- 1 root  root           0 Dec 12 07:45 Engineering_script.sh_3.txt
-rwx------ 1 root  engineering   46 Dec 12 07:45 Engineering_script.sh_script1.sh
-rwxr-xr-x 1 root  root          46 Dec 12 07:45 Engineering_script.sh_script2.sh
-rw-r--r-- 1 root  root           0 Dec 12 07:45 deduction.doc_2.txt
-rw-r--r-- 1 root  root           0 Dec 12 07:45 game_is_afoot.txt_1.txt
root@Baker_Street_Linux_Server:/home# chown :engineering adler/Engineering_script.sh_script2.sh
root@Baker_Street_Linux_Server:/home# ls -ahl adler
total 36K
drwxr-x--- 1 adler adler       4.0K Dec 12 07:45 .
```



root@Baker_Street_Linux_Server: /home/watson
File Edit View Search Terminal Help

```
root@Baker_Street_Linux_Server:/home# chmod 770 adler/Engineering_script.sh_script1.sh
root@Baker_Street_Linux_Server:/home# cd adler
root@Baker_Street_Linux_Server:/home/adler# chmod 770 Engineering_script.sh_script2.sh
root@Baker_Street_Linux_Server:/home/adler# ls
Engineering_script.sh_0.txt  Engineering_script.sh_3.txt  Engineering_script.sh_script1.sh  Engineering_script.sh_script2.sh  deduction.doc_2.txt  game_is_afoot.txt_1.txt
root@Baker_Street_Linux_Server:/home/adler# ls -ahl
total 36K
drwxrwx--- 1 adler adler       4.0K Dec 12 07:45 .
drwxr-xr-x 1 root  root        4.0K Feb 25 02:09 ..
-rw-r--r-- 1 adler adler        220 Jan  6  2022 .bash_logout
-rw-r--r-- 1 adler adler       3.7K Jan  6  2022 .bashrc
-rw-r--r-- 1 adler adler        807 Jan  6  2022 .profile
-rw-r--r-- 1 root  root           0 Dec 12 07:45 Engineering_script.sh_0.txt
-rw-r--r-- 1 root  root           0 Dec 12 07:45 Engineering_script.sh_3.txt
-rwxrwx--- 1 root  engineering   46 Dec 12 07:45 Engineering_script.sh_script1.sh
-rwxrwx--- 1 root  engineering   46 Dec 12 07:45 Engineering_script.sh_script2.sh
-rw-r--r-- 1 root  root           0 Dec 12 07:45 deduction.doc_2.txt
-rw-r--r-- 1 root  root           0 Dec 12 07:45 game_is_afoot.txt_1.txt
root@Baker_Street_Linux_Server:/home/adler# cd ../..
root@Baker_Street_Linux_Server:/# cd home
root@Baker_Street_Linux_Server:/home# ls
adler  moriarty  mrs_hudson  mycroft  sherlock  sysadmin  toby  watson
root@Baker_Street_Linux_Server:/home# cd mrs_hudson
root@Baker_Street_Linux_Server:/home/mrs_hudson# ls
Engineering_script.sh_1.txt  deduction.doc_0.txt  deduction.doc_2.txt  elementary.txt_3.txt  elementary.txt_script1.sh  elementary.txt_script2.sh
root@Baker_Street_Linux_Server:/home/mrs_hudson# ls -ahl
total 32K
drwxr-x--- 1 mrs_hudson mrs_hudson 4.0K Dec 12 07:45 .
drwxr-xr-x 1 root       root       4.0K Feb 25 02:09 ..
-rw-r--r-- 1 mrs_hudson mrs_hudson  220 Jan  6  2022 .bash_logout
-rw-r--r-- 1 mrs_hudson mrs_hudson 3.7K Jan  6  2022 .bashrc
-rw-r--r-- 1 mrs_hudson mrs_hudson  807 Jan  6  2022 .profile
-rw-r--r-- 1 root       root          0 Dec 12 07:45 Engineering_script.sh_1.txt
-rw-r--r-- 1 root       root          0 Dec 12 07:45 deduction.doc_0.txt
-rw-r--r-- 1 root       root          0 Dec 12 07:45 deduction.doc_2.txt
-rw-r--r-- 1 root       root          0 Dec 12 07:45 elementary.txt_3.txt
-rwxr-xr-x 1 root       root         51 Dec 12 07:45 elementary.txt_script1.sh
-rwxr-xr-x 1 root       root         51 Dec 12 07:45 elementary.txt_script2.sh
root@Baker_Street_Linux_Server:/home/mrs_hudson# cd ../..
root@Baker_Street_Linux_Server:/# cd home
root@Baker_Street_Linux_Server:/home# ls
adler  moriarty  mrs_hudson  mycroft  sherlock  sysadmin  toby  watson
root@Baker_Street_Linux_Server:/home# cd sherlock
root@Baker_Street_Linux_Server:/home/sherlock# ls -ahl
total 32K
drwxr-x--- 1 sherlock sherlock 4.0K Dec 12 07:45 .
drwxr-xr-x 1 root     root     4.0K Feb 25 02:09 ..
-rw-r--r-- 1 sherlock sherlock  220 Jan  6  2022 .bash_logout
```

Day Two

DAY TWO

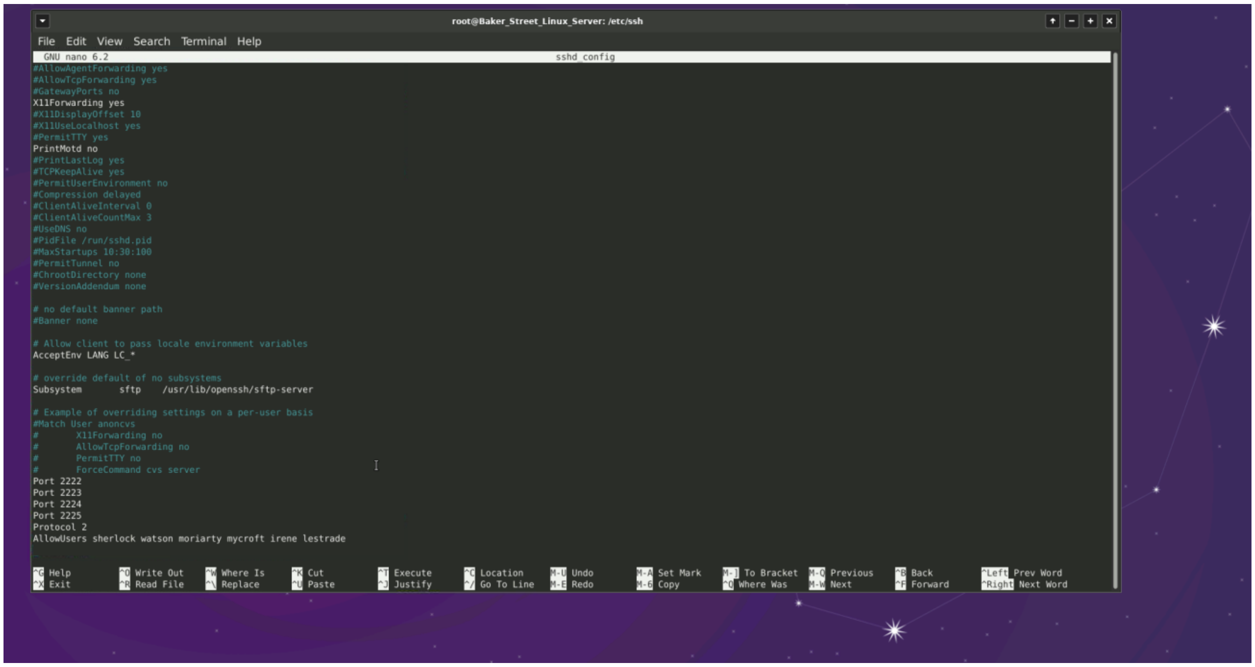
Auditing and Securing SSH

Auditing and Securing SSH:

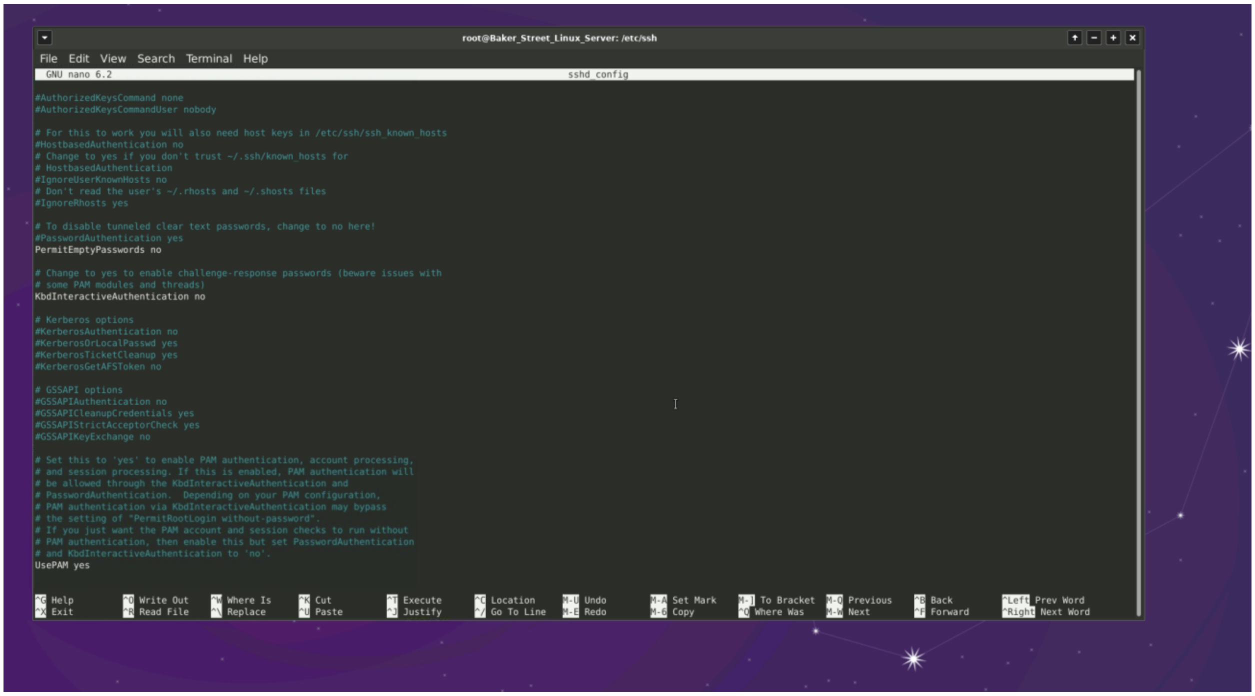
I ran the command nano /etc/ssh/sshd_config. While in this file I made the changes needed.

- I disable empty password,
- disable root login,
- enable ssh protocol 2.

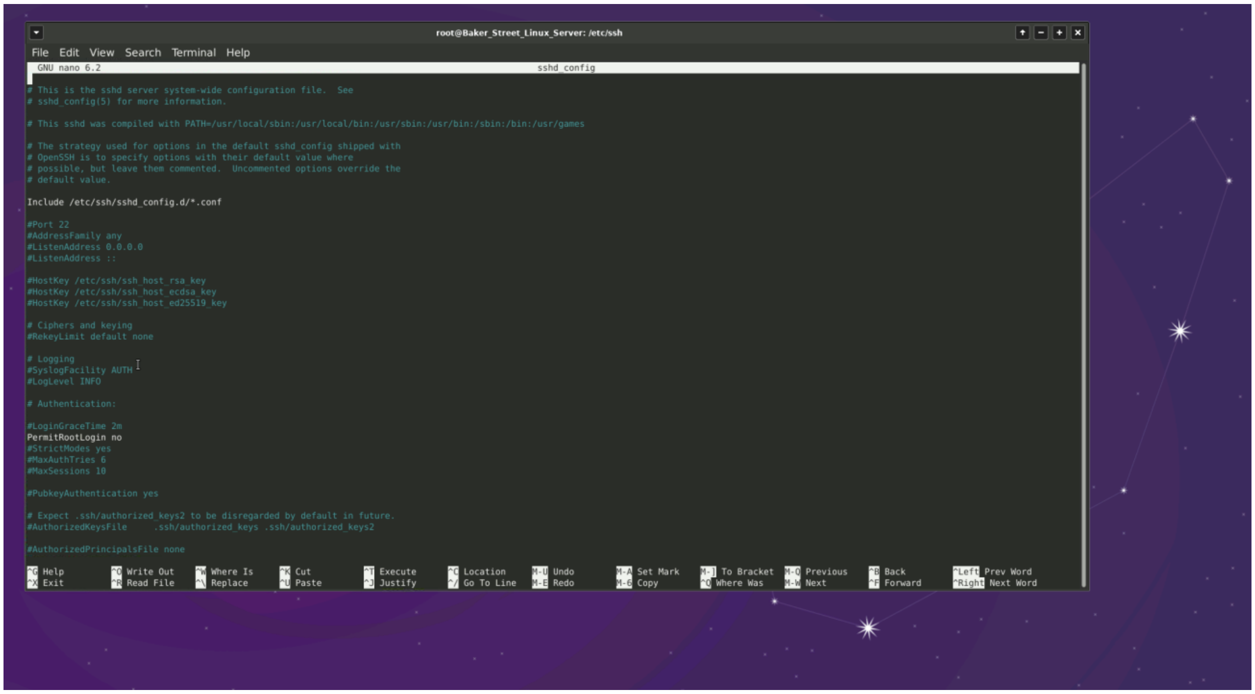
The screenshots will show the work that I did. Once I was done with that, I made sure I saved everything. Then I ran the command service ssh status to restart ssh (last screenshot).



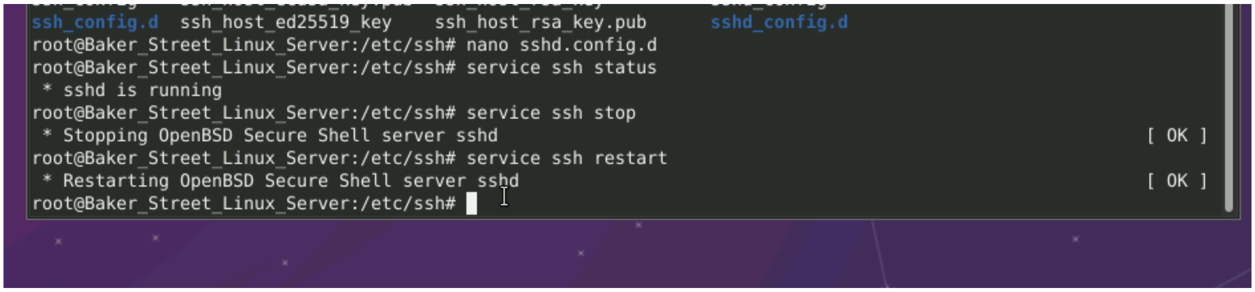
```
#AllowAgentForwarding yes
#AllowTcpForwarding yes
#GatewayPorts no
X11Forwarding yes
#X11DisplayOffset 10
#X11UseLocalhost yes
#PermitTTY yes
PrintMotd no
#PrintLastLog yes
#TCPKeepAlive yes
#PermitUserEnvironment no
#Compression delayed
#ClientAliveInterval 0
#ClientAliveCountMax 3
#UseDNS no
#PidFile /run/sshd.pid
#MaxStartups 10:30:100
#PermitTunnel no
#ChrootDirectory none
#VersionAddendum none

# no default banner path
#Banner none

# Allow client to pass locale environment variables
AcceptEnv LANG LC_*

# override default of no subsystems
Subsystem       sftp    /usr/lib/openssh/sftp-server

# Example of overriding settings on a per-user basis
#Match User anoncvs
#       X11Forwarding no
#       AllowTcpForwarding no
#       PermitTTY no
#       ForceCommand cvs server
Port 2222
Port 2223
Port 2224
Port 2225
Protocol 2
AllowUsers sherlock watson moriarty mycroft irene lestrade
```


root@Baker_Street_Linux_Server: /etc/ssh
File Edit View Search Terminal Help
GNU nano 6.2
sshd_config
^G Help ^X Exit
^O Write Out ^R Read File
^W Where Is ^\ Replace
^K Cut ^U Paste
^T Execute ^J Justify
^C Location ^/ Go To Line
M-U Undo M-E Redo
M-A Set Mark M-6 Copy
M-] To Bracket ^Q Where Was
M-Q Previous M-W Next
^B Back ^F Forward
^Left Prev Word ^Right Next Word

```
#AuthorizedKeysCommand none
#AuthorizedKeysCommandUser nobody

# For this to work you will also need host keys in /etc/ssh/ssh_known_hosts
#HostbasedAuthentication no
# Change to yes if you don't trust ~/.ssh/known_hosts for
# 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
#KerberosGetAFSToken no

# GSSAPI options
#GSSAPIAuthentication no
#GSSAPICleanupCredentials yes
#GSSAPIStrictAcceptorCheck yes
#GSSAPIKeyExchange no

# Set this to 'yes' to enable PAM authentication, account processing,
# and session processing. If this is enabled, PAM authentication will
# be allowed through the KbdInteractiveAuthentication and
# PasswordAuthentication.  Depending on your PAM configuration,
# PAM authentication via KbdInteractiveAuthentication may bypass
# the setting of "PermitRootLogin without-password".
# If you just want the PAM account and session checks to run without
# PAM authentication, then enable this but set PasswordAuthentication
# and KbdInteractiveAuthentication to 'no'.
UsePAM yes
```


root@Baker_Street_Linux_Server: /etc/ssh
File Edit View Search Terminal Help
GNU nano 6.2
sshd_config
^G Help ^X Exit
^O Write Out ^R Read File
^W Where Is ^\ Replace
^K Cut ^U Paste
^T Execute ^J Justify
^C Location ^/ Go To Line
M-U Undo M-E Redo
M-A Set Mark M-6 Copy
M-] To Bracket ^Q Where Was
M-Q Previous M-W Next
^B Back ^F Forward
^Left Prev Word ^Right Next Word

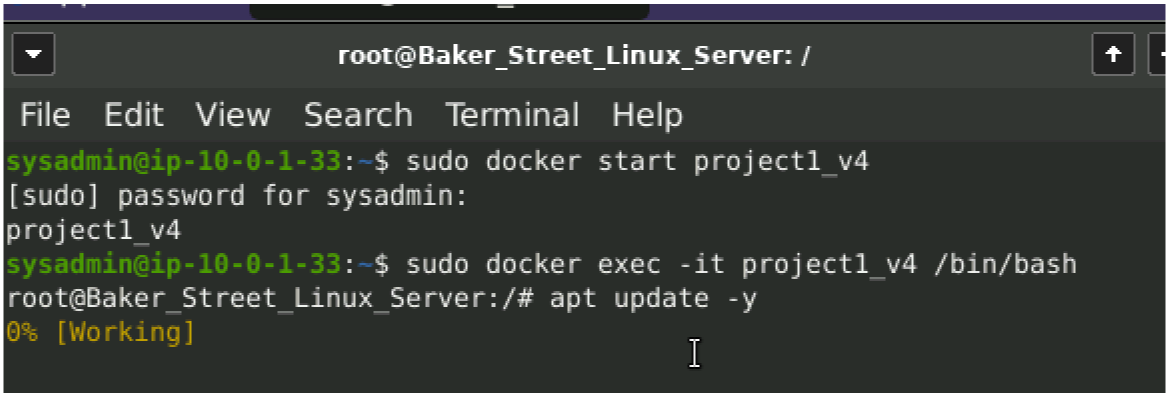
```
# This is the sshd server system-wide configuration file.  See
# sshd_config(5) for more information.

# This sshd was compiled with PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games

# The strategy used for options in the default sshd_config shipped with
# OpenSSH is to specify options with their default value where
# possible, but leave them commented.  Uncommented options override the
# default value.

Include /etc/ssh/sshd_config.d/*.conf

#Port 22
#AddressFamily any
#ListenAddress 0.0.0.0
#ListenAddress ::

#HostKey /etc/ssh/ssh_host_rsa_key
#HostKey /etc/ssh/ssh_host_ecdsa_key
#HostKey /etc/ssh/ssh_host_ed25519_key

# Ciphers and keying
#RekeyLimit default none

# Logging
#SyslogFacility AUTH
#LogLevel INFO

# Authentication:

#LoginGraceTime 2m
PermitRootLogin no
#StrictModes yes
#MaxAuthTries 6
#MaxSessions 10

#PubkeyAuthentication yes

# Expect .ssh/authorized_keys2 to be disregarded by default in future.
#AuthorizedKeysFile     .ssh/authorized_keys .ssh/authorized_keys2

#AuthorizedPrincipalsFile none
```



```
ssh_config.d  ssh_host_ed25519_key    ssh_host_rsa_key.pub      sshd_config.d
root@Baker_Street_Linux_Server:/etc/ssh# nano sshd.config.d
root@Baker_Street_Linux_Server:/etc/ssh# service ssh status
 * sshd is running
root@Baker_Street_Linux_Server:/etc/ssh# service ssh stop
 * Stopping OpenBSD Secure Shell server sshd                                                   [ OK ]
root@Baker_Street_Linux_Server:/etc/ssh# service ssh restart
 * Restarting OpenBSD Secure Shell server sshd                                                 [ OK ]
root@Baker_Street_Linux_Server:/etc/ssh# 
```

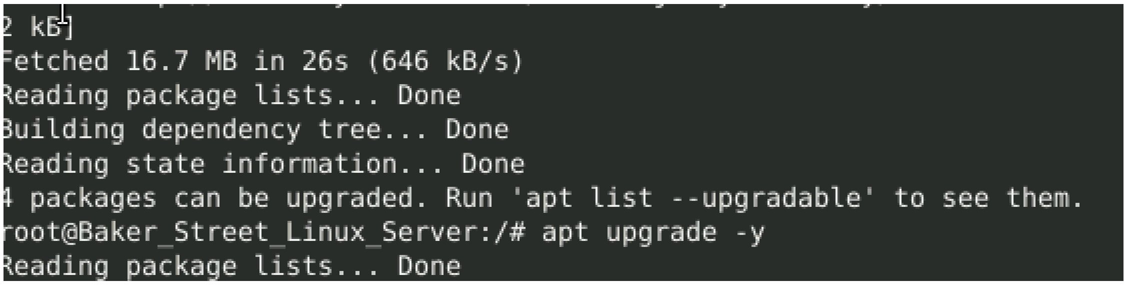
Review, Update, Add system packages

- I ran the command apt update to make sure it has the version of all packages.


root@Baker_Street_Linux_Server: /
File Edit View Search Terminal Help

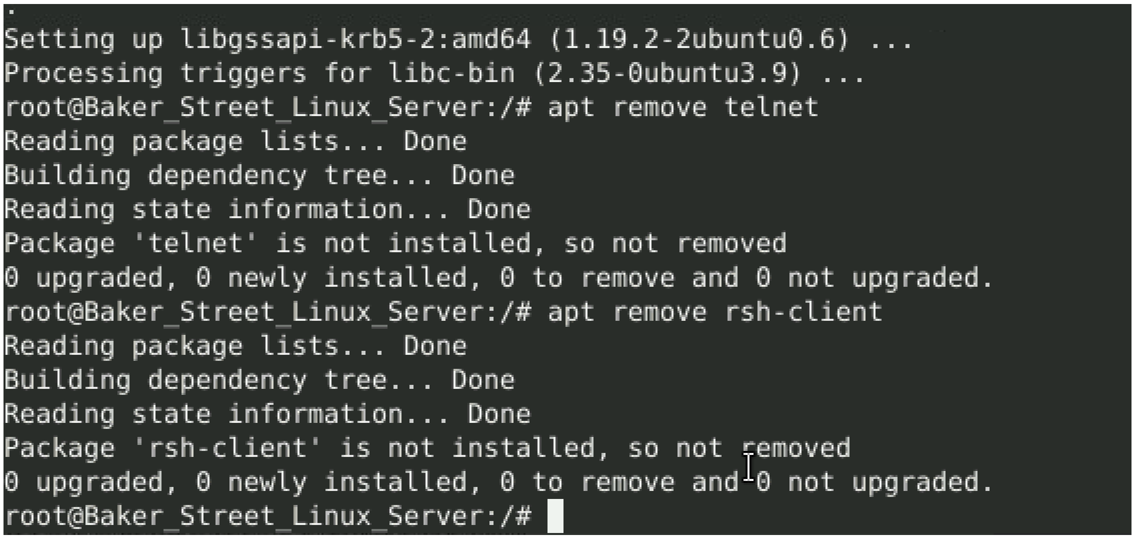
```
sysadmin@ip-10-0-1-33:~$ sudo docker start project1_v4
[sudo] password for sysadmin:
project1_v4
sysadmin@ip-10-0-1-33:~$ sudo docker exec -it project1_v4 /bin/bash
root@Baker_Street_Linux_Server:/# apt update -y
0% [Working]
```

- I ran the command apt upgrade –y to update all already installed packages to the latest version.



```
2 kB]
Fetched 16.7 MB in 26s (646 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
4 packages can be upgraded. Run 'apt list --upgradable' to see them.
root@Baker_Street_Linux_Server:/# apt upgrade -y
Reading package lists... Done
```

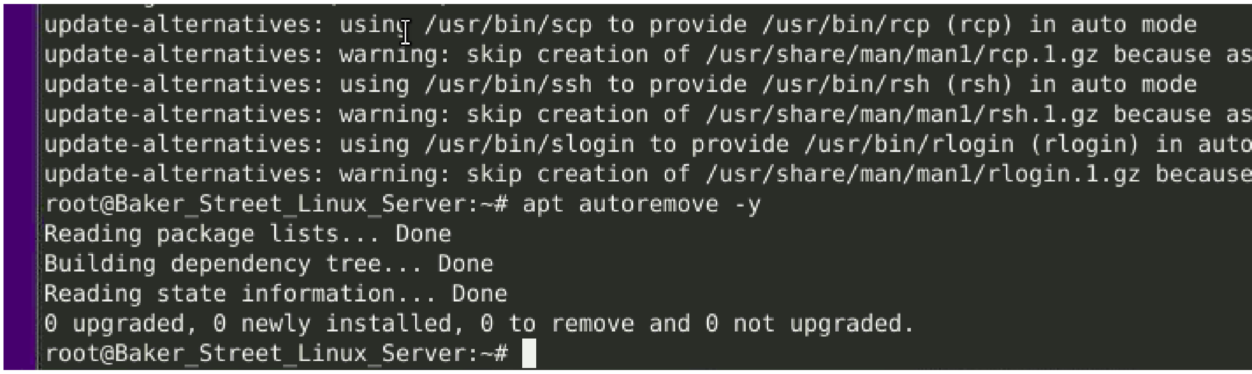
- I then removed the telnet package and rsh-client package.



```
.
Setting up libgssapi-krb5-2:amd64 (1.19.2-2ubuntu0.6) ...
Processing triggers for libc-bin (2.35-0ubuntu3.9) ...
root@Baker_Street_Linux_Server:/# apt remove telnet
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Package 'telnet' is not installed, so not removed
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@Baker_Street_Linux_Server:/# apt remove rsh-client
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Package 'rsh-client' is not installed, so not removed
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@Baker_Street_Linux_Server:/#
```

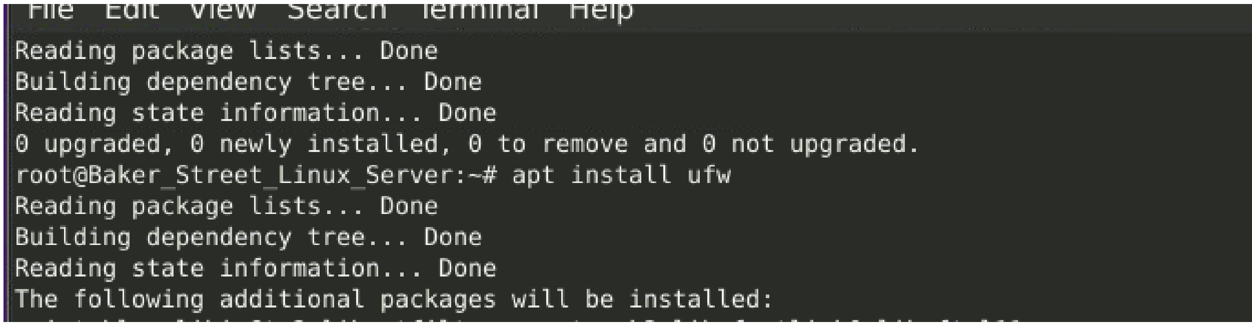
- I did some online research to find out why telnet and rsh-client needed to be removed. The reason why we removed telnet was because any username and password can be easily intercepted by hackers or attacks. Rsh-client was removed because of unencrypted information over the network, which makes us vulnerable to spoofing attacks.

- I ran the command apt autoremove –y to clean up dependencies, remove disk space, and remove old files that are no longer needed to be on the system.

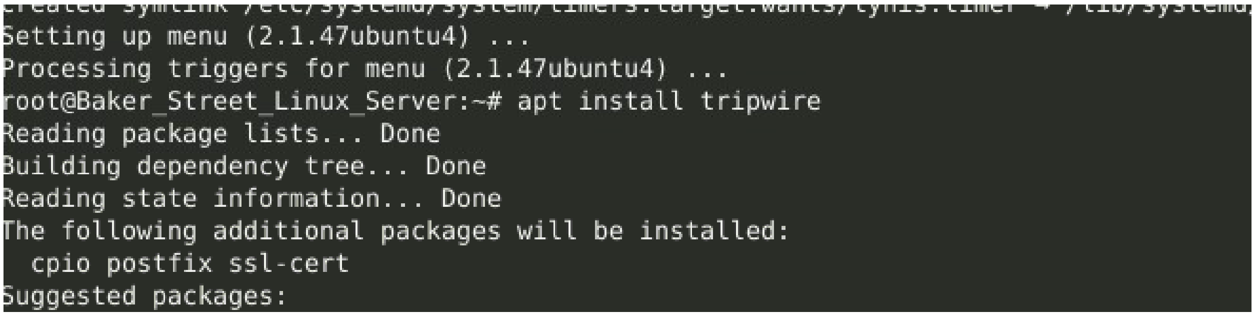


```
update-alternatives: using /usr/bin/scp to provide /usr/bin/rcp (rcp) in auto mode
update-alternatives: warning: skip creation of /usr/share/man/man1/rcp.1.gz because as
update-alternatives: using /usr/bin/ssh to provide /usr/bin/rsh (rsh) in auto mode
update-alternatives: warning: skip creation of /usr/share/man/man1/rsh.1.gz because as
update-alternatives: using /usr/bin/slogin to provide /usr/bin/rlogin (rlogin) in auto
update-alternatives: warning: skip creation of /usr/share/man/man1/rlogin.1.gz because
root@Baker_Street_Linux_Server:~# apt autoremove -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@Baker_Street_Linux_Server:~#
```

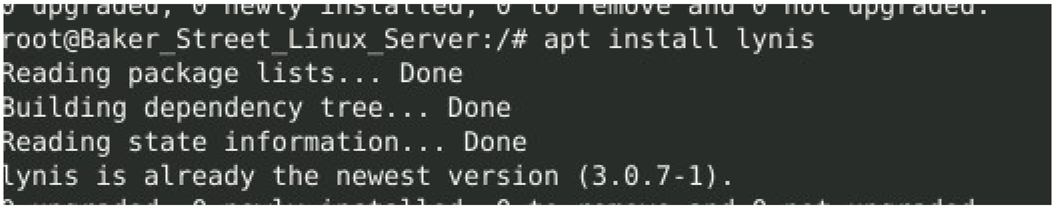
- I ran the command apt install and added the following packages ufw, lynis, and tripwire.



```
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@Baker_Street_Linux_Server:~# apt install ufw
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
```



```
Created symlink /etc/systemd/system/timers.target.wants/lynis.timer → /lib/systemd/
Setting up menu (2.1.47ubuntu4) ...
Processing triggers for menu (2.1.47ubuntu4) ...
root@Baker_Street_Linux_Server:~# apt install tripwire
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  cpio postfix ssl-cert
Suggested packages:
```

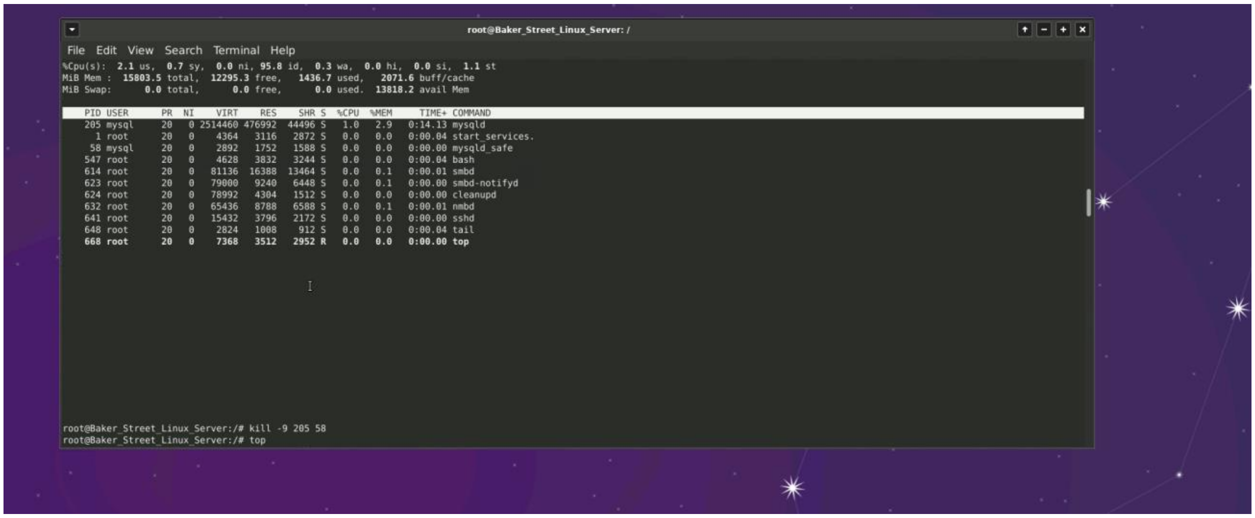


```
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@Baker_Street_Linux_Server:/# apt install lynis
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
lynis is already the newest version (3.0.7-1).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
```

- UFW can block incoming traffic, deny and limit traffic for firewall rules and can log network traffic to help detect and analyze attacks. Lynis scans the system and checks for vulnerabilities within the system. Tripwire has multiple functions of monitoring and unauthorized changes.

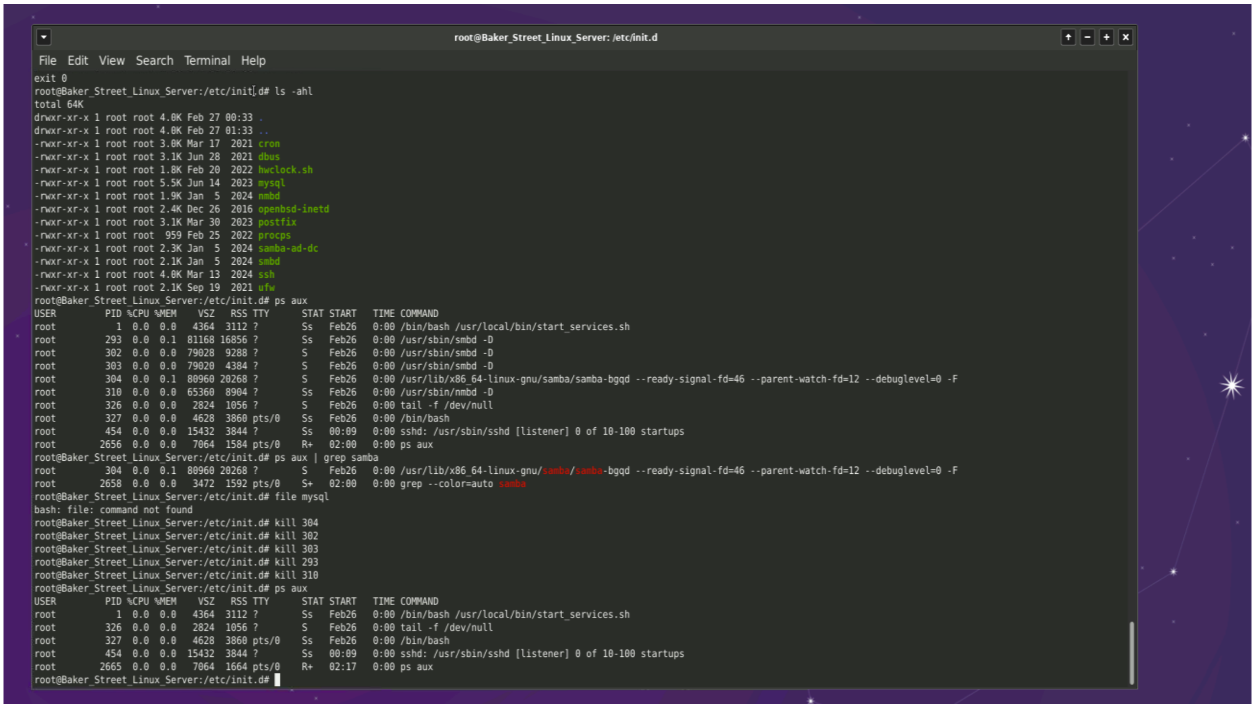
Disabling Unnecesary service

I ran the top command to see the current services running. I found some services running in the background that needed to be killed. Those PID numbers were 205 and 58.


root@Baker_Street_Linux_Server: /
File Edit View Search Terminal Help

```
%Cpu(s):  2.1 us,  0.7 sy,  0.0 ni, 95.8 id,  0.3 wa,  0.0 hi,  0.0 si,  1.1 st
MiB Mem :  15803.5 total,  12295.3 free,   1436.7 used,   2071.6 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.  13818.2 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
    205 mysql     20   0 2514460 476992  44496 S   1.0   2.9   0:14.13 mysqld
      1 root      20   0    4364   3116   2872 S   0.0   0.0   0:00.04 start_services.
     58 mysql     20   0    2892   1752   1588 S   0.0   0.0   0:00.00 mysqld_safe
    547 root      20   0    4628   3832   3244 S   0.0   0.0   0:00.04 bash
    614 root      20   0   81136  16388  13464 S   0.0   0.1   0:00.01 smbd
    623 root      20   0   79000   9240   6448 S   0.0   0.1   0:00.00 smbd-notifyd
    624 root      20   0   78992   4304   1512 S   0.0   0.0   0:00.00 cleanupd
    632 root      20   0   65436   8788   6588 S   0.0   0.1   0:00.01 nmbd
    641 root      20   0   15432   3796   2172 S   0.0   0.0   0:00.00 sshd
    648 root      20   0    2824   1008    912 S   0.0   0.0   0:00.04 tail
    668 root      20   0    7368   3512   2952 R   0.0   0.0   0:00.00 top




root@Baker_Street_Linux_Server:/# kill -9 205 58
root@Baker_Street_Linux_Server:/# top
```

- I also ran the ps aux command and killed PID numbers 304,302,303,293,310.

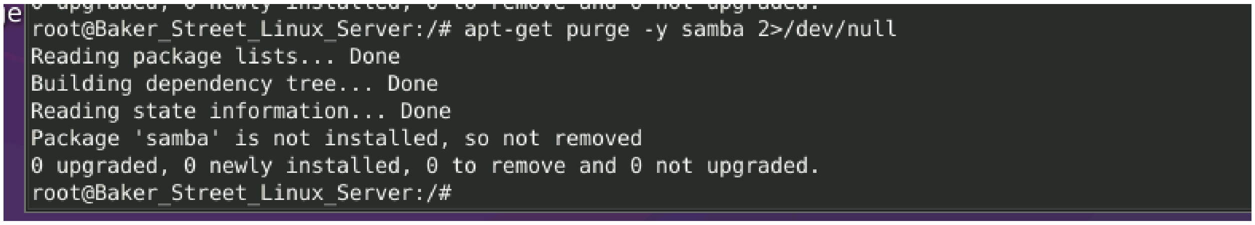

root@Baker_Street_Linux_Server: /etc/init.d
File Edit View Search Terminal Help

```
exit 0
root@Baker_Street_Linux_Server:/etc/init.d# ls -ahl
total 64K
drwxr-xr-x 1 root root 4.0K Feb 27 00:33 .
drwxr-xr-x 1 root root 4.0K Feb 27 01:33 ..
-rwxr-xr-x 1 root root 3.0K Mar 17  2021 cron
-rwxr-xr-x 1 root root 3.1K Jun 28  2021 dbus
-rwxr-xr-x 1 root root 1.8K Feb 20  2022 hwclock.sh
-rwxr-xr-x 1 root root 5.5K Jun 14  2023 mysql
-rwxr-xr-x 1 root root 1.9K Jan  5  2024 nmbd
-rwxr-xr-x 1 root root 2.4K Dec 26  2016 openbsd-inetd
-rwxr-xr-x 1 root root 3.1K Mar 30  2023 postfix
-rwxr-xr-x 1 root root  959 Feb 25  2022 procps
-rwxr-xr-x 1 root root 2.3K Jan  5  2024 samba-ad-dc
-rwxr-xr-x 1 root root 2.1K Jan  5  2024 smbd
-rwxr-xr-x 1 root root 4.0K Mar 13  2024 ssh
-rwxr-xr-x 1 root root 2.1K Sep 19  2021 ufw
root@Baker_Street_Linux_Server:/etc/init.d# ps aux
USER         PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root           1  0.0  0.0   4364  3112 ?        Ss   Feb26   0:00 /bin/bash /usr/local/bin/start_services.sh
root         293  0.0  0.1  81168 16856 ?        Ss   Feb26   0:00 /usr/sbin/smbd -D
root         302  0.0  0.0  79028  9288 ?        S    Feb26   0:00 /usr/sbin/smbd -D
root         303  0.0  0.0  79020  4384 ?        S    Feb26   0:00 /usr/sbin/smbd -D
root         304  0.0  0.1  80960 20268 ?        S    Feb26   0:00 /usr/lib/x86_64-linux-gnu/samba/samba-bgqd --ready-signal-fd=46 --parent-watch-fd=12 --debuglevel=0 -F
root         310  0.0  0.0  65360  8904 ?        Ss   Feb26   0:00 /usr/sbin/nmbd -D
root         326  0.0  0.0   2824  1056 ?        S    Feb26   0:00 tail -f /dev/null
root         327  0.0  0.0   4628  3860 pts/0    Ss   Feb26   0:00 /bin/bash
root         454  0.0  0.0  15432  3844 ?        Ss   00:09   0:00 sshd: /usr/sbin/sshd [listener] 0 of 10-100 startups
root        2656  0.0  0.0   7064  1584 pts/0    R+   02:00   0:00 ps aux
root@Baker_Street_Linux_Server:/etc/init.d# ps aux | grep samba
root         304  0.0  0.1  80960 20268 ?        S    Feb26   0:00 /usr/lib/x86_64-linux-gnu/samba/samba-bgqd --ready-signal-fd=46 --parent-watch-fd=12 --debuglevel=0 -F
root        2658  0.0  0.0   3472  1592 pts/0    S+   02:00   0:00 grep --color=auto samba
root@Baker_Street_Linux_Server:/etc/init.d# file mysql
bash: file: command not found
root@Baker_Street_Linux_Server:/etc/init.d# kill 304
root@Baker_Street_Linux_Server:/etc/init.d# kill 302
root@Baker_Street_Linux_Server:/etc/init.d# kill 303
root@Baker_Street_Linux_Server:/etc/init.d# kill 293
root@Baker_Street_Linux_Server:/etc/init.d# kill 310
root@Baker_Street_Linux_Server:/etc/init.d# ps aux
USER         PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root           1  0.0  0.0   4364  3112 ?        Ss   Feb26   0:00 /bin/bash /usr/local/bin/start_services.sh
root         326  0.0  0.0   2824  1056 ?        S    Feb26   0:00 tail -f /dev/null
root         327  0.0  0.0   4628  3860 pts/0    Ss   Feb26   0:00 /bin/bash
root         454  0.0  0.0  15432  3844 ?        Ss   00:09   0:00 sshd: /usr/sbin/sshd [listener] 0 of 10-100 startups
root        2665  0.0  0.0   7064  1664 pts/0    R+   02:17   0:00 ps aux
root@Baker_Street_Linux_Server:/etc/init.d#
```

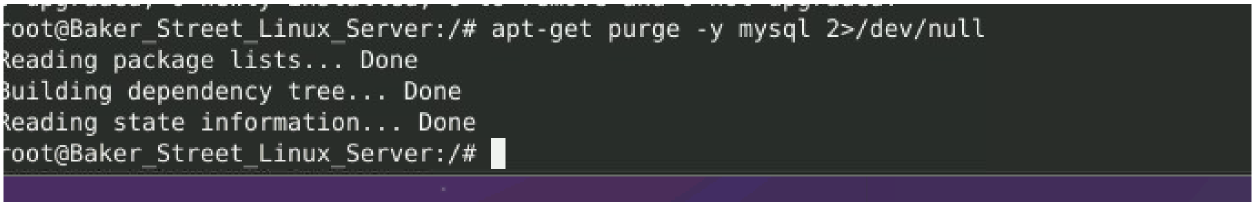
I then did some research because we couldn't use the systemctl to remove mysql and samba, so we needed to use the service command to remove it.

- After conducting my research, I ran the command apt-get purge –y samba 2>/dev/null which allowed me to remove samba.

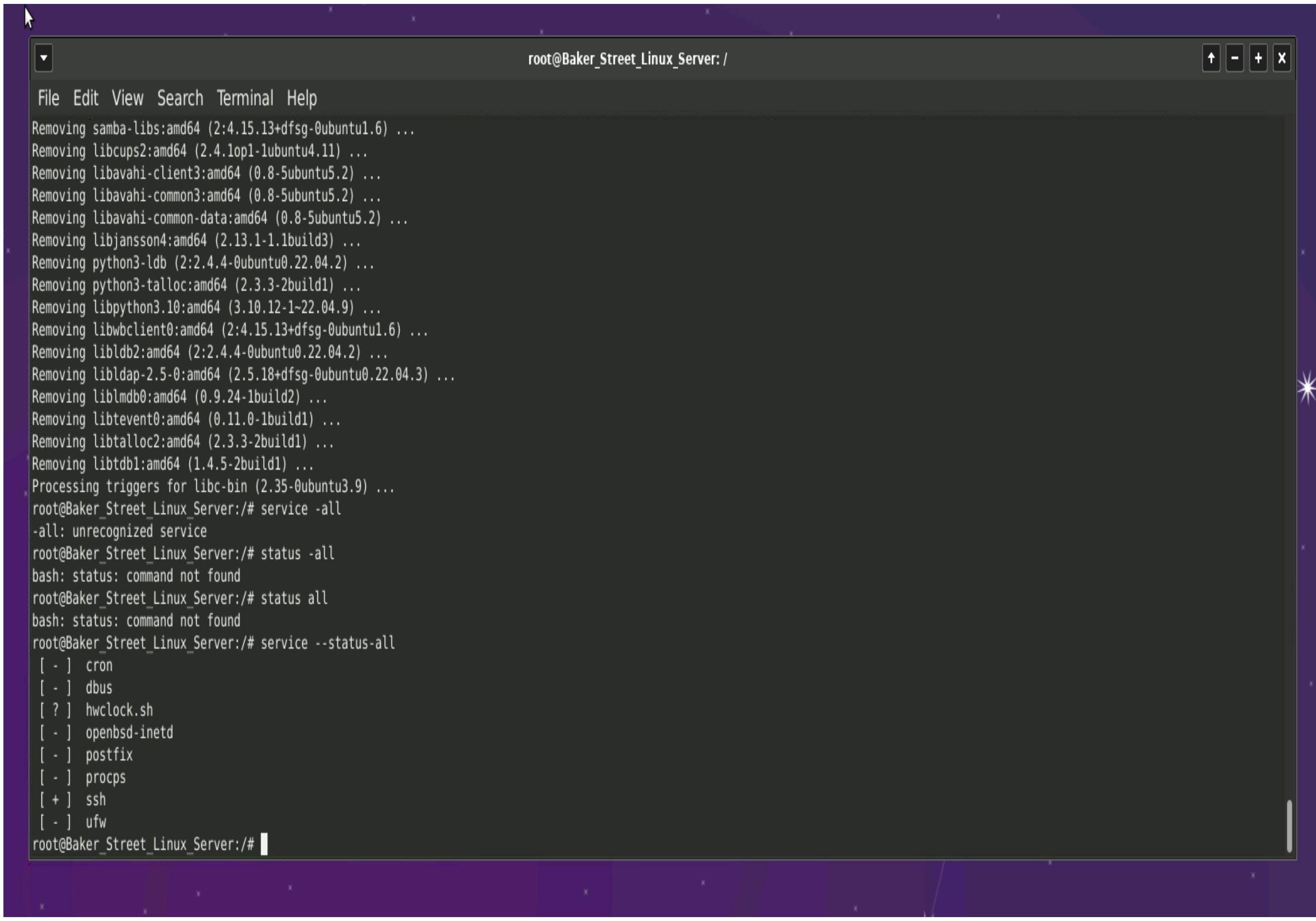
- I then ran the same command and changed it to mysql to remove mysql. I then ran service –status –all to check and see if samba and mysql had been removed.



```
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@Baker_Street_Linux_Server:/# apt-get purge -y samba 2>/dev/null
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Package 'samba' is not installed, so not removed
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@Baker_Street_Linux_Server:/#
```



```
oot@Baker_Street_Linux_Server:/# apt-get purge -y mysql 2>/dev/null
eading package lists... Done
uilding dependency tree... Done
eading state information... Done
oot@Baker_Street_Linux_Server:/#
```



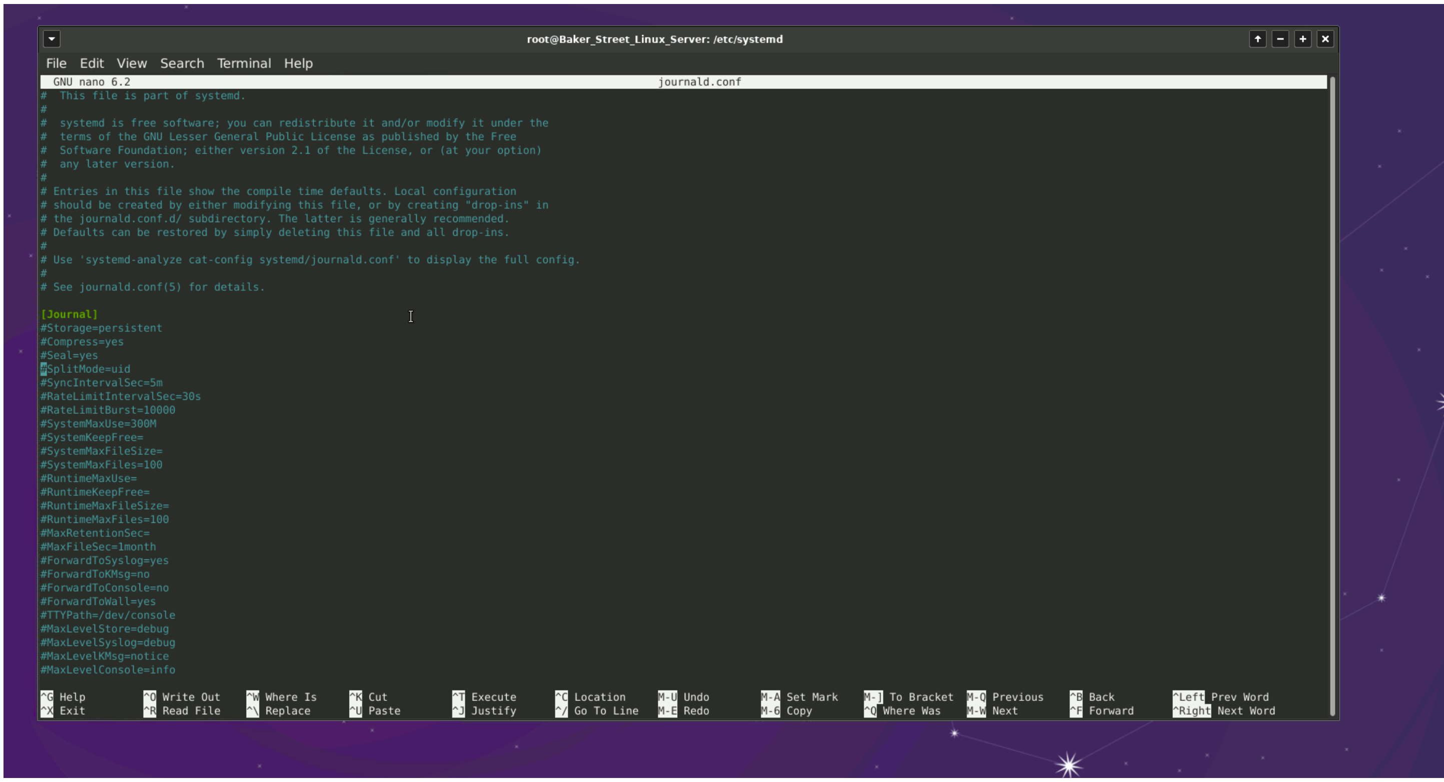
root@Baker_Street_Linux_Server: /
File Edit View Search Terminal Help

```
Removing samba-libs:amd64 (2:4.15.13+dfsg-0ubuntu1.6) ...
Removing libcups2:amd64 (2.4.1op1-1ubuntu4.11) ...
Removing libavahi-client3:amd64 (0.8-5ubuntu5.2) ...
Removing libavahi-common3:amd64 (0.8-5ubuntu5.2) ...
Removing libavahi-common-data:amd64 (0.8-5ubuntu5.2) ...
Removing libjansson4:amd64 (2.13.1-1.1build3) ...
Removing python3-ldb (2:2.4.4-0ubuntu0.22.04.2) ...
Removing python3-talloc:amd64 (2.3.3-2build1) ...
Removing libpython3.10:amd64 (3.10.12-1~22.04.9) ...
Removing libwbclient0:amd64 (2:4.15.13+dfsg-0ubuntu1.6) ...
Removing libldb2:amd64 (2:2.4.4-0ubuntu0.22.04.2) ...
Removing libldap-2.5-0:amd64 (2.5.18+dfsg-0ubuntu0.22.04.3) ...
Removing liblmdb0:amd64 (0.9.24-1build2) ...
Removing libtevent0:amd64 (0.11.0-1build1) ...
Removing libtalloc2:amd64 (2.3.3-2build1) ...
Removing libtdb1:amd64 (1.4.5-2build1) ...
Processing triggers for libc-bin (2.35-0ubuntu3.9) ...
root@Baker_Street_Linux_Server:/# service -all
-all: unrecognized service
root@Baker_Street_Linux_Server:/# status -all
bash: status: command not found
root@Baker_Street_Linux_Server:/# status all
bash: status: command not found
root@Baker_Street_Linux_Server:/# service --status-all
 [ - ]  cron
 [ - ]  dbus
 [ ? ]  hwclock.sh
 [ - ]  openbsd-inetd
 [ - ]  postfix
 [ - ]  procps
 [ + ]  ssh
 [ - ]  ufw
root@Baker_Street_Linux_Server:/#
```

Enabling and Configuring Logging

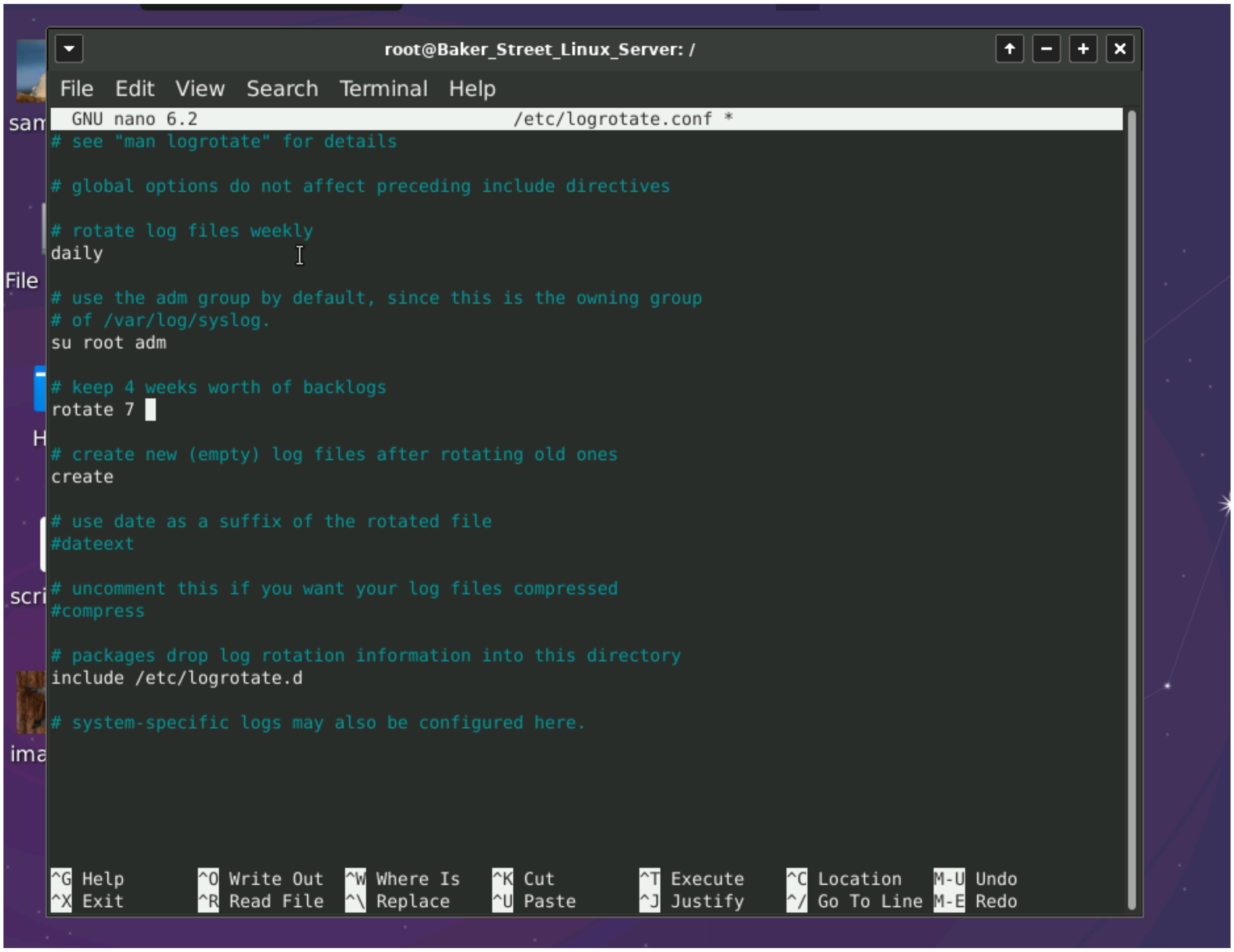
I ran the command nano /etc/systemd/journald.conf to make changes.

- The changes I made was set “storage=persistent
    - This will save logs locally on the machine
- The other change I made was systemMaxuse=300
    - This configures the max disk space logs can utilize.


root@Baker_Street_Linux_Server: /etc/systemd
File Edit View Search Terminal Help
GNU nano 6.2
journald.conf

```
#  This file is part of systemd.
#
#  systemd is free software; you can redistribute it and/or modify it under the
#  terms of the GNU Lesser General Public License as published by the Free
#  Software Foundation; either version 2.1 of the License, or (at your option)
#  any later version.
#
# Entries in this file show the compile time defaults. Local configuration
# should be created by either modifying this file, or by creating "drop-ins" in
# the journald.conf.d/ subdirectory. The latter is generally recommended.
# Defaults can be restored by simply deleting this file and all drop-ins.
#
# Use 'systemd-analyze cat-config systemd/journald.conf' to display the full config.
#
# See journald.conf(5) for details.

[Journal]
#Storage=persistent
#Compress=yes
#Seal=yes
#SplitMode=uid
#SyncIntervalSec=5m
#RateLimitIntervalSec=30s
#RateLimitBurst=10000
#SystemMaxUse=300M
#SystemKeepFree=
#SystemMaxFileSize=
#SystemMaxFiles=100
#RuntimeMaxUse=
#RuntimeKeepFree=
#RuntimeMaxFileSize=
#RuntimeMaxFiles=100
#MaxRetentionSec=
#MaxFileSec=1month
#ForwardToSyslog=yes
#ForwardToKMsg=no
#ForwardToConsole=no
#ForwardToWall=yes
#TTYPath=/dev/console
#MaxLevelStore=debug
#MaxLevelSyslog=debug
#MaxLevelKMsg=notice
#MaxLevelConsole=info
```

- Next, I ran the command nano /etc/logrotate.conf. The changes I made were changing the log rotation from weekly **to daily** and rotating out the **logs after 7 days.**



root@Baker_Street_Linux_Server: /
File Edit View Search Terminal Help
sam
File
H
scri
ima

```
  GNU nano 6.2                          /etc/logrotate.conf *
# see "man logrotate" for details

# global options do not affect preceding include directives

# rotate log files weekly
daily

# use the adm group by default, since this is the owning group
# of /var/log/syslog.
su root adm

# keep 4 weeks worth of backlogs
rotate 7

# create new (empty) log files after rotating old ones
create

# use date as a suffix of the rotated file
#dateext

# uncomment this if you want your log files compressed
#compress

# packages drop log rotation information into this directory
include /etc/logrotate.d

# system-specific logs may also be configured here.
```

^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location M-U Undo
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line M-E Redo

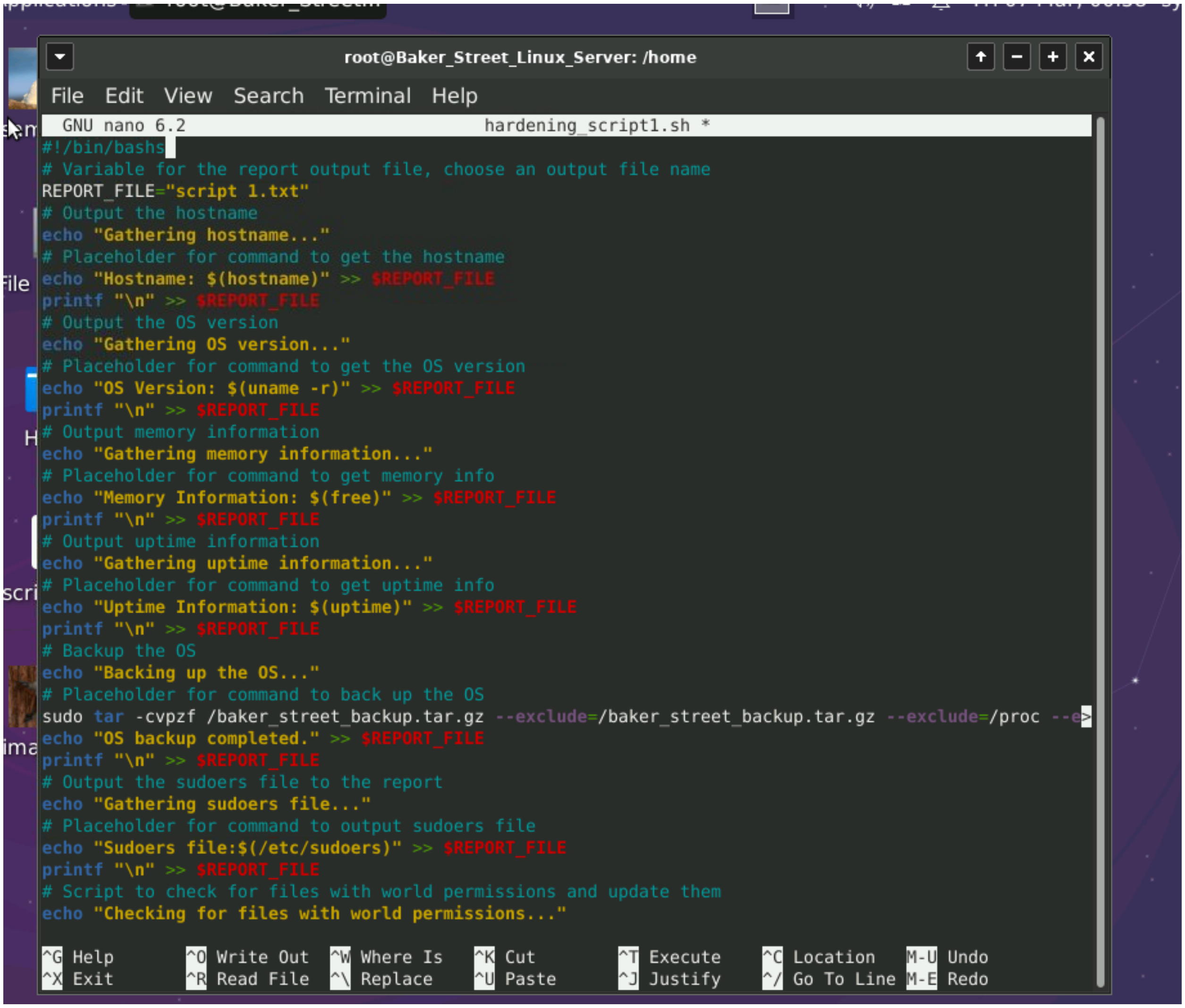
Day Three

DAY THREE

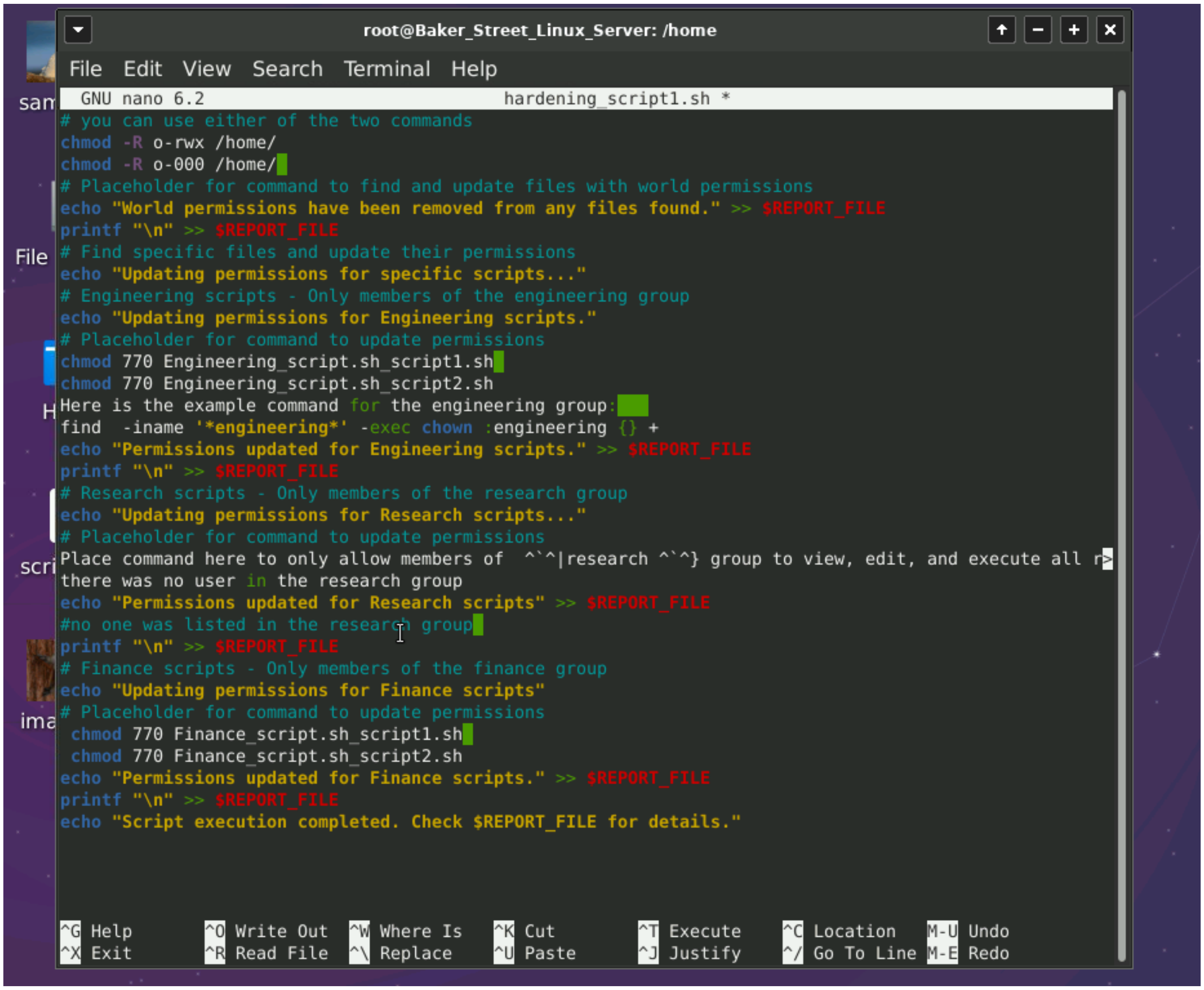
Scripting Tasks

I created a script located in the home directory that was named hardening_script1.sh into the home directory. The changes I made are listed below.

- The changes I made were to list all the commands. hostname command, OS command, uname -r, the free command and uptime.
- For the backup I entered the command we used earlier for the backup which was tar -cvpzf /baker_street_backup.tar.gz –exclude=baker_street_backup.tar.gz –exclude=/proc –exclude=/tmp –exclude=mnt –exclude=/sys –exclude=/dev –exclude=/run /
- I placed and displayed the sudoers command, which was /etc/sudoers
- I placed the command to show how to remove all world permissions, which was chmod -R o-000, or you can use o-rwx
- Showed the updating permissions of the engineering scripts. Which is listed in the screenshot listed below.
- There are no members listed in the research group. I added a comment in the script saying there was no one in the research group.


root@Baker_Street_Linux_Server: /home
File Edit View Search Terminal Help
GNU nano 6.2
hardening_script1.sh *

```
#!/bin/bashs
# Variable for the report output file, choose an output file name
REPORT_FILE="script 1.txt"
# Output the hostname
echo "Gathering hostname..."
# Placeholder for command to get the hostname
echo "Hostname: $(hostname)" >> $REPORT_FILE
printf "\n" >> $REPORT_FILE
# Output the OS version
echo "Gathering OS version..."
# Placeholder for command to get the OS version
echo "OS Version: $(uname -r)" >> $REPORT_FILE
printf "\n" >> $REPORT_FILE
# Output memory information
echo "Gathering memory information..."
# Placeholder for command to get memory info
echo "Memory Information: $(free)" >> $REPORT_FILE
printf "\n" >> $REPORT_FILE
# Output uptime information
echo "Gathering uptime information..."
# Placeholder for command to get uptime info
echo "Uptime Information: $(uptime)" >> $REPORT_FILE
printf "\n" >> $REPORT_FILE
# Backup the OS
echo "Backing up the OS..."
# Placeholder for command to back up the OS
sudo tar -cvpzf /baker_street_backup.tar.gz --exclude=/baker_street_backup.tar.gz --exclude=/proc --e>
echo "OS backup completed." >> $REPORT_FILE
printf "\n" >> $REPORT_FILE
# Output the sudoers file to the report
echo "Gathering sudoers file..."
# Placeholder for command to output sudoers file
echo "Sudoers file:$(/etc/sudoers)" >> $REPORT_FILE
printf "\n" >> $REPORT_FILE
# Script to check for files with world permissions and update them
echo "Checking for files with world permissions..."
```

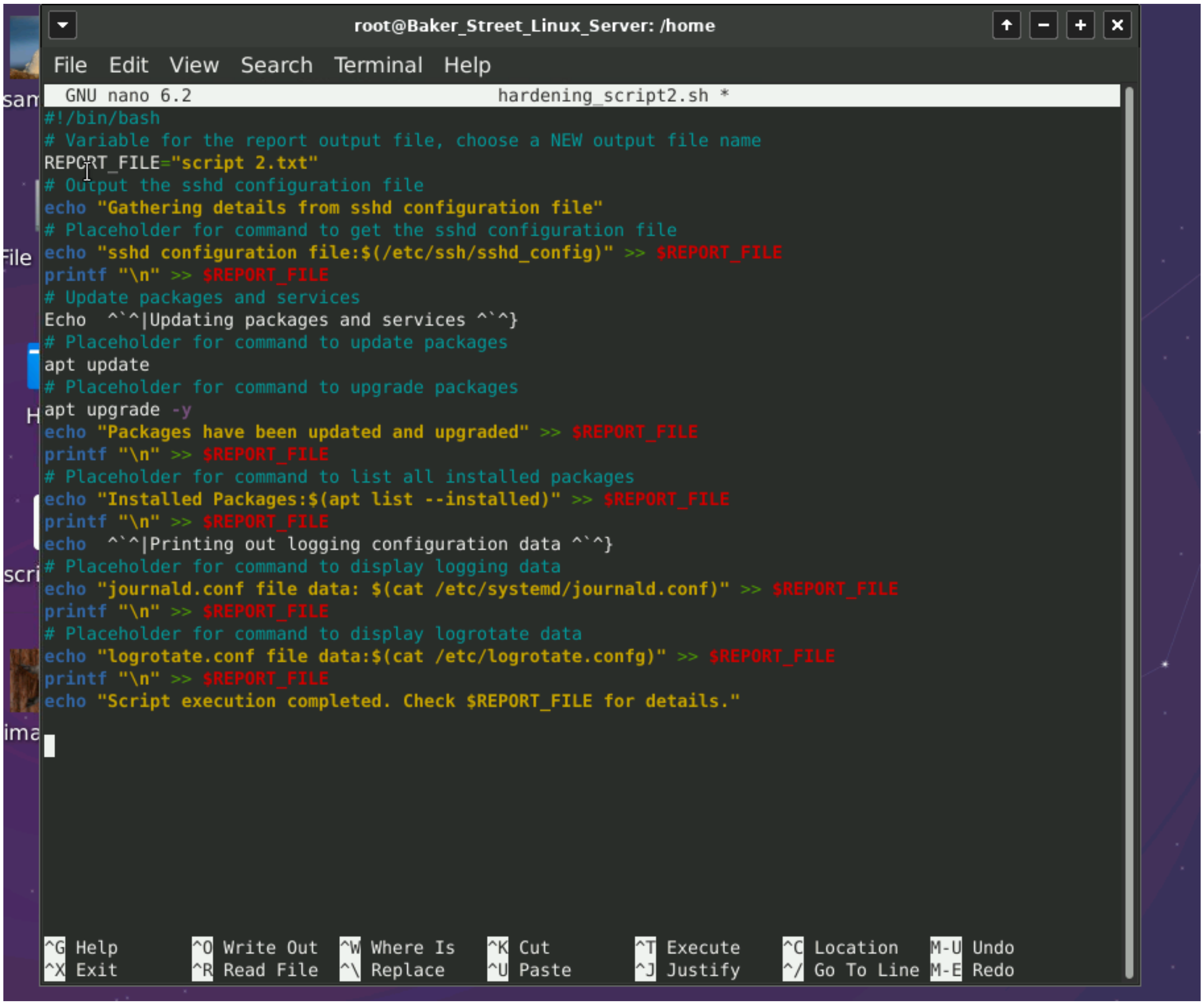


root@Baker_Street_Linux_Server: /home
File Edit View Search Terminal Help
GNU nano 6.2 hardening_script1.sh *

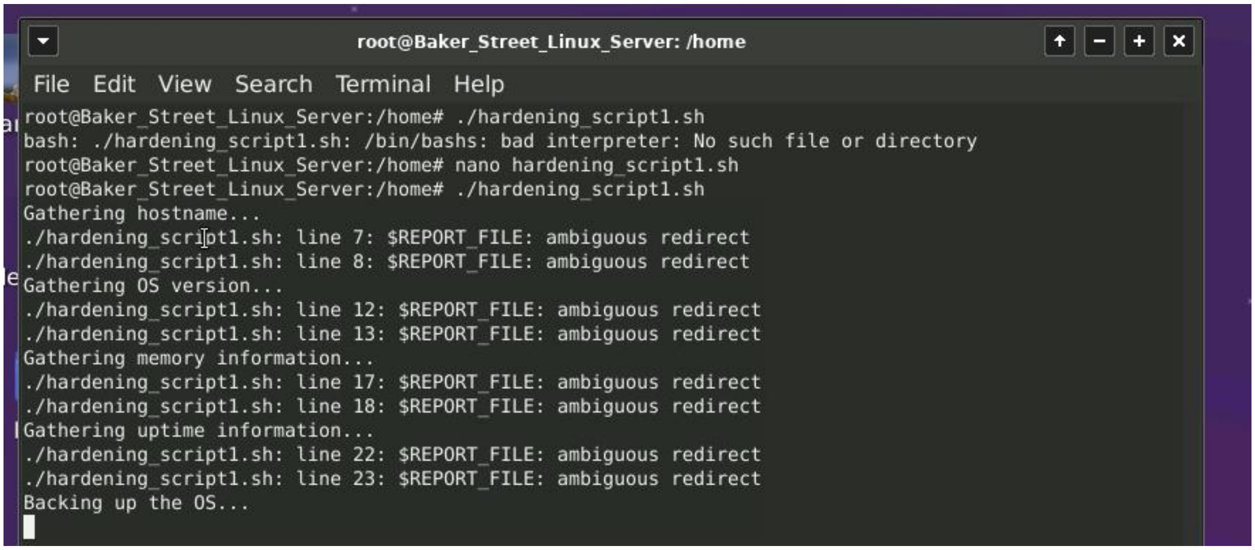
```
# you can use either of the two commands
chmod -R o-rwx /home/
chmod -R o-000 /home/
# Placeholder for command to find and update files with world permissions
echo "World permissions have been removed from any files found." >> $REPORT_FILE
printf "\n" >> $REPORT_FILE
# Find specific files and update their permissions
echo "Updating permissions for specific scripts..."
# Engineering scripts - Only members of the engineering group
echo "Updating permissions for Engineering scripts."
# Placeholder for command to update permissions
chmod 770 Engineering_script.sh_script1.sh
chmod 770 Engineering_script.sh_script2.sh
Here is the example command for the engineering group:
find  -iname '*engineering*' -exec chown :engineering {} +
echo "Permissions updated for Engineering scripts." >> $REPORT_FILE
printf "\n" >> $REPORT_FILE
# Research scripts - Only members of the research group
echo "Updating permissions for Research scripts..."
# Placeholder for command to update permissions
Place command here to only allow members of  ^`^|research ^`^} group to view, edit, and execute all r>
there was no user in the research group
echo "Permissions updated for Research scripts" >> $REPORT_FILE
#no one was listed in the research group
printf "\n" >> $REPORT_FILE
# Finance scripts - Only members of the finance group
echo "Updating permissions for Finance scripts"
# Placeholder for command to update permissions
 chmod 770 Finance_script.sh_script1.sh
 chmod 770 Finance_script.sh_script2.sh
echo "Permissions updated for Finance scripts." >> $REPORT_FILE
printf "\n" >> $REPORT_FILE
echo "Script execution completed. Check $REPORT_FILE for details."
```

For the second script, the changes I made were

- Report_ file, which I named it as script2.txt
- I showed the command I used for the sshd configuration files, which was
  - /etc/ssh/sshd_config
- I showed the command I used to update packages, which was
  - Apt update
- Showed the command to upgrade packages which was
  - Apt upgrade -y
- The command I used to show the installed packages was apt list –installed
- For the journald.conf and the logrotate.conf I made sure I used cat to make sure all the information displayed what was actually in that file.
  - Command I used was
    - cat /etc/logrotate.confg
    - cat /etc/systemd/journal.conf

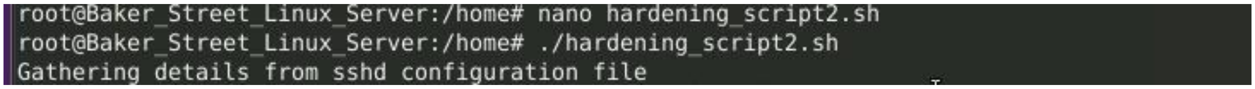

root@Baker_Street_Linux_Server: /home
File Edit View Search Terminal Help
GNU nano 6.2
hardening_script2.sh *

```
#!/bin/bash
# Variable for the report output file, choose a NEW output file name
REPORT_FILE="script 2.txt"
# Output the sshd configuration file
echo "Gathering details from sshd configuration file"
# Placeholder for command to get the sshd configuration file
echo "sshd configuration file:$(/etc/ssh/sshd_config)" >> $REPORT_FILE
printf "\n" >> $REPORT_FILE
# Update packages and services
Echo  ^`^|Updating packages and services ^`^}
# Placeholder for command to update packages
apt update
# Placeholder for command to upgrade packages
apt upgrade -y
echo "Packages have been updated and upgraded" >> $REPORT_FILE
printf "\n" >> $REPORT_FILE
# Placeholder for command to list all installed packages
echo "Installed Packages:$(apt list --installed)" >> $REPORT_FILE
printf "\n" >> $REPORT_FILE
echo  ^`^|Printing out logging configuration data ^`^}
# Placeholder for command to display logging data
echo "journald.conf file data: $(cat /etc/systemd/journald.conf)" >> $REPORT_FILE
printf "\n" >> $REPORT_FILE
# Placeholder for command to display logrotate data
echo "logrotate.conf file data:$(cat /etc/logrotate.confg)" >> $REPORT_FILE
printf "\n" >> $REPORT_FILE
echo "Script execution completed. Check $REPORT_FILE for details."
```


root@Baker_Street_Linux_Server: /home
File Edit View Search Terminal Help

```
root@Baker_Street_Linux_Server:/home# ./hardening_script1.sh
bash: ./hardening_script1.sh: /bin/bashs: bad interpreter: No such file or directory
root@Baker_Street_Linux_Server:/home# nano hardening_script1.sh
root@Baker_Street_Linux_Server:/home# ./hardening_script1.sh
Gathering hostname...
./hardening_script1.sh: line 7: $REPORT_FILE: ambiguous redirect
./hardening_script1.sh: line 8: $REPORT_FILE: ambiguous redirect
Gathering OS version...
./hardening_script1.sh: line 12: $REPORT_FILE: ambiguous redirect
./hardening_script1.sh: line 13: $REPORT_FILE: ambiguous redirect
Gathering memory information...
./hardening_script1.sh: line 17: $REPORT_FILE: ambiguous redirect
./hardening_script1.sh: line 18: $REPORT_FILE: ambiguous redirect
Gathering uptime information...
./hardening_script1.sh: line 22: $REPORT_FILE: ambiguous redirect
./hardening_script1.sh: line 23: $REPORT_FILE: ambiguous redirect
Backing up the OS...
```

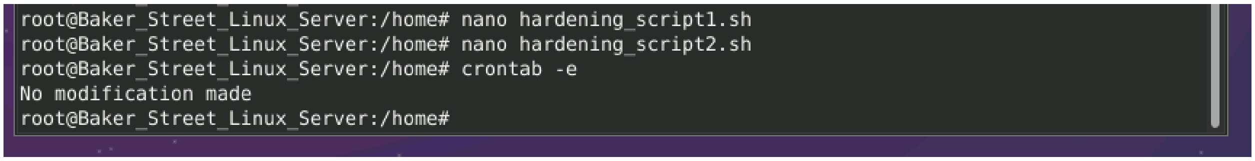
I then ran the command ./hardening_script1.sh and then I ran ./hardening_script2.sh to make sure the scripts ran properly.



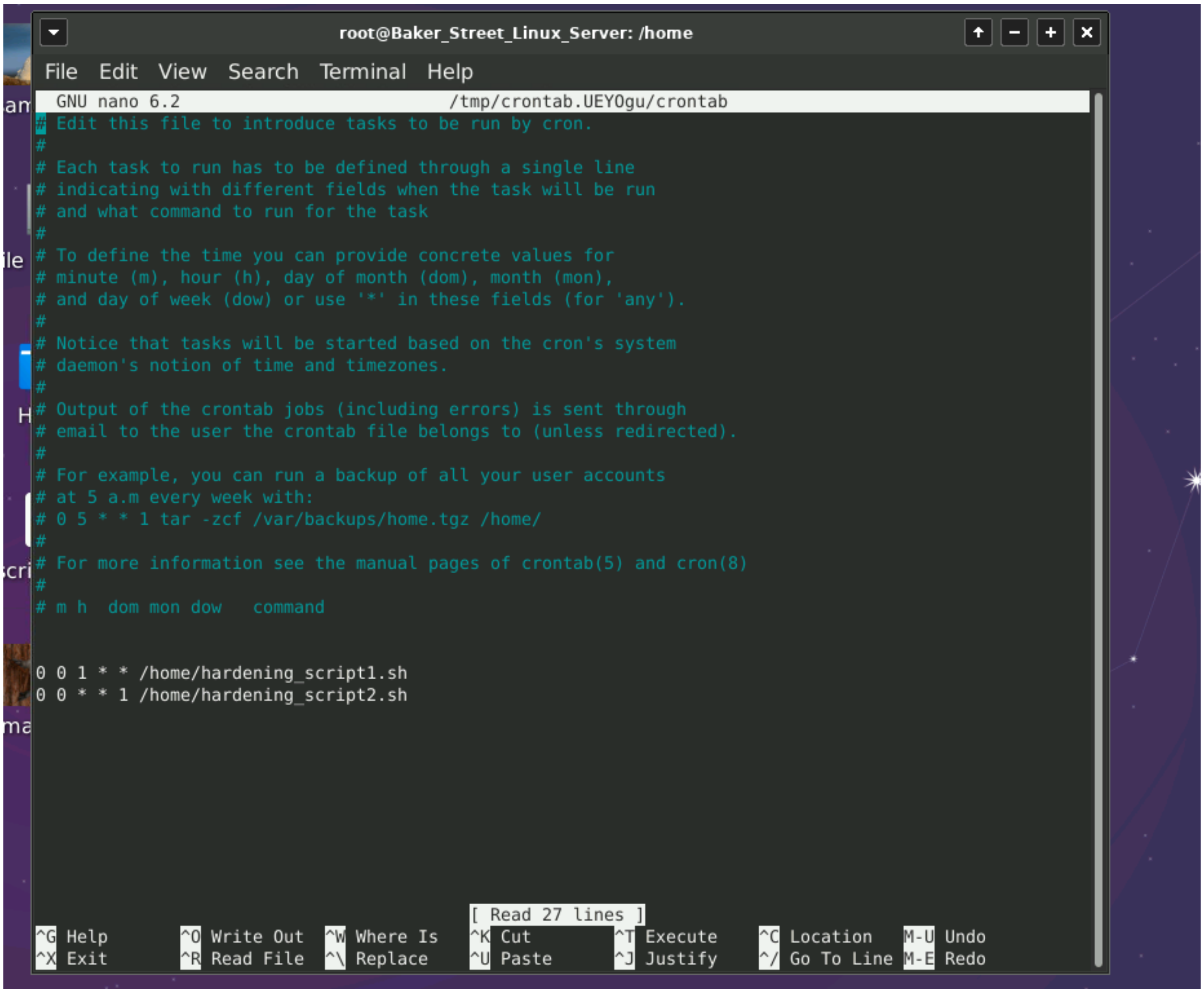
```
root@Baker_Street_Linux_Server:/home# nano hardening_script2.sh
root@Baker_Street_Linux_Server:/home# ./hardening_script2.sh
Gathering details from sshd configuration file
```

Scheduling Your Scripts

I ran the crontab -e command to schedule the scripts 1 and 2. Script 1 is going to run once a month for the first month. Script 2 is going to run once a week every Monday



```
root@Baker_Street_Linux_Server:/home# nano hardening_script1.sh
root@Baker_Street_Linux_Server:/home# nano hardening_script2.sh
root@Baker_Street_Linux_Server:/home# crontab -e
No modification made
root@Baker_Street_Linux_Server:/home#
```



root@Baker_Street_Linux_Server: /home
File Edit View Search Terminal Help

```
  GNU nano 6.2                          /tmp/crontab.UEYOgu/crontab
# Edit this file to introduce tasks to be run by cron.
#
# Each task to run has to be defined through a single line
# indicating with different fields when the task will be run
# and what command to run for the task
#
# To define the time you can provide concrete values for
# minute (m), hour (h), day of month (dom), month (mon),
# and day of week (dow) or use '*' in these fields (for 'any').
#
# Notice that tasks will be started based on the cron's system
# daemon's notion of time and timezones.
#
# Output of the crontab jobs (including errors) is sent through
# email to the user the crontab file belongs to (unless redirected).
#
# For example, you can run a backup of all your user accounts
# at 5 a.m every week with:
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/
#
# For more information see the manual pages of crontab(5) and cron(8)
#
# m h  dom mon dow   command


0 0 1 * * /home/hardening_script1.sh
0 0 * * 1 /home/hardening_script2.sh

                                          [ Read 27 lines ]
```

CONCLUSION

To summarize this project, I will discuss some of the potential hardening or mitigation actions that could be implemented to make sure we are keeping our data and information safe. I would make sure all the users and groups have the right permissions to the right files and information. This would mean always keeping the groups up to date, especially if you have employees moving into different groups and leaving the company. Make sure the right employees have the right access to files and directories that they are supposed to have access to. Also, make sure that each group has the right access to files as well. During the project, I had to go into certain users' home directories and make some changes to which files they should have access to.

Another action that can be implemented is to make sure all users have password requirements. This means no more easy passwords like Spring2021. Having passwords with more advanced requirements is going to help protect the company if there were someone trying gain access to our files and data.

Limiting who we give sudo access to is another action that can be implemented. People who have sudo access can alter almost anything in your system. This means that they can alter files, bypass permissions on certain files, and create backdoors. Limiting access to sudo users will be a key action to keeping our data safe. During the project, on day one, updating and enforcing sudo permissions, I made changes to this file. I gave Sherlock full sudo permissions, I gave Watson and Mycroft sudo privileges to run a certain script, and I gave all the employees in the research group sudo privileges to run a certain script as well.

One of the final and most important actions we need to take is making sure all of our packages are up to date. This means running the command apt update and apt upgrade to keep all our packages up to date. Having packages that are not up to date can lead to exploitable vulnerabilities and malware.