



Cybersecurity

Project 1 Hardening Summary and Checklist

OS Information

Customer	Baker Street Corporation
Hostname	ip-172-22-117-108 <pre>root@ip-172-22-117-108:/home/sysadmin# hostname ip-172-22-117-108</pre>
OS Version	Ubuntu 24.04.1 LTS (Noble Numbat) <pre>root@ip-172-22-117-108:/home/sysadmin# cat /etc/os-release PRETTY_NAME="Ubuntu 24.04.1 LTS" NAME="Ubuntu" VERSION_ID="24.04" VERSION="24.04.1 LTS (Noble Numbat)"</pre>
Memory information	<pre>sysadmin@ip-172-22-117-108:~\$ free -h total used free shared buff/cache available Mem: 914Mi 781Mi 114Mi 26Mi 191Mi 132Mi Swap: 0B 0B 0B</pre>
Uptime information	<pre>sysadmin@ip-172-22-117-108:~\$ uptime 01:04:28 up 21 min, 1 user, load average: 0.07, 0.03, 0.00</pre>

Checklist

Completed	Activity	Script(s) used / Tasks completed / Screenshots
•	OS backup	sudo 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 /

```
/etc/rc0.d/K0lopen-vm-tools
/etc/rc0.d/K01nmbd
/etc/rc0.d/K01mysql
/etc/rc0.d/K01cryptdisks
/etc/rc0.d/K01plymouth
/etc/rc0.d/K01openbsd-inetd
/etc/rc0.d/K01cryptdisks-early
/etc/rc0.d/K01smbd
/etc/rc0.d/K01irqbalance
/etc/rc0.d/K01chrony
/etc/rc0.d/K01samba-ad-dc
/etc/rc0.d/K01iscsid
/etc/vtrgb
/etc/subuid
/etc/gai.conf
/etc/cron.hourly/
/etc/cron.hourly/.placeholder
/etc/timezone
/etc/mtab
/etc/dpkg/
/etc/dpkg/dpkg.cfg.d/
/etc/dpkg/dpkg.cfg.d/needrestart
/etc/dpkg/origins/
/etc/dpkg/origins/ubuntu
/etc/dpkg/origins/default
/etc/dpkg/origins/debian
/etc/dpkg/dpkg.cfg
/etc/python3.12/
/etc/python3.12/sitecustomize.py
/etc/ld.so.conf
/etc/xattr.conf
root@ip-172-22-117-108:/home/sysadmin# █
```

```
root@ip-172-22-117-108:#
root@ip-172-22-117-108:/# ls -l
total 1533892
-rw-r--r--  1 root root      2746 Dec  6 02:49 Monthly_Report
-rw-r--r--  1 root root      2746 Dec  6 02:54 Monthly_Report.txt
-rw-r--r--  1 root root    113186 Dec  6 02:58 Weekly_Report.txt
-rw-r--r--  1 root root 1570480507 Dec  3 01:31 baker_street_backup.tar.gz
lrwxrwxrwx  1 root root           7 Apr 22 2024 bin -> usr/bin
```

- Auditing users and groups

a. Remove all terminated users including their home directories and files:

```
ls -l /home  
sudo userdel -r lestrade  
sudo userdel -r irene  
sudo userdel -r mary  
sudo userdel -r gregson
```

```
77 2024-12-03 01:47:38 history  
78 2024-12-03 01:51:28 sudo userdel -r lestrade  
79 2024-12-03 01:51:46 ls -l /home/  
80 2024-12-03 01:53:07 sudo userdel -r irene  
81 2024-12-03 01:53:28 sudo userdel -r mary  
82 2024-12-03 01:54:47 sudo userdel -r gregson  
83 2024-12-03 01:55:03 ls -l /home/  
84 2024-12-03 01:55:55 history
```

```
userdel: testrude mail spool (/var/mail/testrude) not found
root@ip-172-22-117-108:/home/sysadmin# ls -l /home/
total 48
drwxr-x--- 2 adler      adler      4096 Oct 22 16:36 adler
drwxr-x--- 2 gregson   gregson   4096 Oct 22 16:36 gregson
drwxr-x--- 2 irene      irene      4096 Oct 22 16:35 irene
drwxr-x--- 2 mary       mary      4096 Oct 22 16:36 mary
drwxr-x--- 2 moriarty   moriarty   4096 Oct 22 16:35 moriarty
drwxr-x--- 2 mrs_hudson mrs_hudson 4096 Oct 22 16:35 mrs_hudson
drwxr-x--- 2 mycroft    mycroft    4096 Oct 22 16:35 mycroft
drwxr-x--- 2 sherlock   sherlock   4096 Oct 22 16:35 sherlock
drwxr-x--- 4 sysadmin   sysadmin   4096 Dec  3 01:04 sysadmin
drwxr-x--- 2 toby       toby      4096 Oct 22 16:36 toby
drwxr-x--- 3 ubuntu     ubuntu     4096 Oct 22 16:32 ubuntu
drwxr-x--- 2 watson    watson    4096 Oct 22 16:35 watson
root@ip-172-22-117-108:/home/sysadmin# sudo userdel -r irene
userdel: irene mail spool (/var/mail/irene) not found
root@ip-172-22-117-108:/home/sysadmin# sudo userdel -r mary
userdel: mary mail spool (/var/mail/mary) not found
root@ip-172-22-117-108:/home/sysadmin# sudo userdel -r gregson
userdel: gregson mail spool (/var/mail/gregson) not found
root@ip-172-22-117-108:/home/sysadmin# ls -l /home/
total 36
drwxr-x--- 2 adler      adler      4096 Oct 22 16:36 adler
drwxr-x--- 2 moriarty   moriarty   4096 Oct 22 16:35 moriarty
drwxr-x--- 2 mrs_hudson mrs_hudson 4096 Oct 22 16:35 mrs_hudson
drwxr-x--- 2 mycroft    mycroft    4096 Oct 22 16:35 mycroft
drwxr-x--- 2 sherlock   sherlock   4096 Oct 22 16:35 sherlock
drwxr-x--- 4 sysadmin   sysadmin   4096 Dec  3 01:04 sysadmin
drwxr-x--- 2 toby       toby      4096 Oct 22 16:36 toby
drwxr-x--- 3 ubuntu     ubuntu     4096 Oct 22 16:32 ubuntu
drwxr-x--- 2 watson    watson    4096 Oct 22 16:35 watson
```

Confirming terminated users, their home directories and files have been removed:

```
ls -l /home  
id irene mary lestrade gregson
```

```
root@ip-172-22-117-108:/home/sysadmin# id irene mary lestrade gregson  
id: 'irene': no such user  
id: 'mary': no such user  
id: 'lestrade': no such user  
id: 'gregson': no such user  
root@ip-172-22-117-108:/home/sysadmin# █
```

b. Lock all user accounts of staff on temporary leave

```
sudo usermod -L moriarty  
sudo usermod -L mrs_hudson
```

```
root@ip-172-22-117-108:/home/sysadmin# sudo usermod -L moriarty  
root@ip-172-22-117-108:/home/sysadmin# sudo usermod -L mrs_hudson  
root@ip-172-22-117-108:/home/sysadmin# █
```

c. Unlock any users that are employed

Confirming status of the user accounts:

```
sudo passwd -S sherlock  
sudo passwd -S watson  
sudo passwd -S mycroft  
sudo passwd -S toby  
sudo passwd -S adler
```

```
root@ip-172-22-117-108:/home/sysadmin# sudo passwd -S sherlock && watson
sherlock P 2024-10-22 0 99999 7 -1
watson: command not found
root@ip-172-22-117-108:/home/sysadmin# sudo passwd -S watson
watson P 2024-10-22 0 99999 7 -1
root@ip-172-22-117-108:/home/sysadmin# sudo passwd -S mycroft
mycroft P 2024-10-22 0 99999 7 -1
root@ip-172-22-117-108:/home/sysadmin# sudo passwd -S toby
toby L 2024-10-22 0 99999 7 -1
root@ip-172-22-117-108:/home/sysadmin# sudo passwd -S adler
adler L 2024-10-22 0 99999 7 -1
root@ip-172-22-117-108:/home/sysadmin#
```

Change user's password to unlock them:

```
usermod -p password toby
usermod -p password adler
```

```
103 2024-12-03 02:16:21 root@ip-172-22-117-108:/home/sysadmin# sudo usermod -U toby
104 2024-12-03 02:16:21 usermod: unlocking the user's password would result in a passwordless account.
You should set a password with usermod -p to unlock this user's password.
105 2024-12-03 02:16:22 root@ip-172-22-117-108:/home/sysadmin# usermod -p password toby
106 2024-12-03 02:16:22 root@ip-172-22-117-108:/home/sysadmin# usermod -p password adler
107 2024-12-03 02:16:22 root@ip-172-22-117-108:/home/sysadmin# sudo usermod -U toby
108 2024-12-03 02:16:32 root@ip-172-22-117-108:/home/sysadmin# sudo usermod -U adler
109 2024-12-03 02:16:41 root@ip-172-22-117-108:/home/sysadmin# sudo usermod -U toby
110 2024-12-03 02:16:41 usermod: unlocking the user's password would result in a passwordless account.
You should set a password with usermod -p to unlock this user's password.
111 2024-12-03 02:16:41 root@ip-172-22-117-108:/home/sysadmin# usermod -p password toby
112 2024-12-03 02:16:41 root@ip-172-22-117-108:/home/sysadmin# usermod -p password adler
113 2024-12-03 02:16:41 root@ip-172-22-117-108:/home/sysadmin# sudo usermod -U toby
```

```
sudo usermod -S toby
sudo usermod -S adler
```

```
105 2024-12-03 02:16:22 root@ip-172-22-117-108:/home/sysadmin# usermod -p password toby
106 2024-12-03 02:16:22 root@ip-172-22-117-108:/home/sysadmin# usermod -p password adler
107 2024-12-03 02:16:22 root@ip-172-22-117-108:/home/sysadmin# sudo usermod -U toby
108 2024-12-03 02:16:32 root@ip-172-22-117-108:/home/sysadmin# sudo usermod -U adler
109 2024-12-03 02:16:41 root@ip-172-22-117-108:/home/sysadmin# usermod -p password toby
110 2024-12-03 02:16:41 root@ip-172-22-117-108:/home/sysadmin# usermod -p password adler
```

d. Move employees from marketing department to new group research
Confirming members of groups for the employees:

tail -15 /etc/group

```
117 2024-12-03 02:19:18 group
118 2024-12-03 02:20:42 cat /etc/group
119 2024-12-03 02:24:41 sudo addgroup research
120 2024-12-03 02:25:11 tail /etc/group
121 2024-12-03 02:25:31 tail -15 /etc/group
```

Create new group research:

sudo addgroup research

```
119 2024-12-03 02:24:41 sudo addgroup research
120 2024-12-03 02:25:11 tail /etc/group
121 2024-12-03 02:25:31 tail -15 /etc/group
```

Add user mycroft to research group and remove user from marketing group:

sudo usermod -G marketing mycroft

sudo usermod -aG research mycroft

```
121 2024-12-03 02:25:31 tail -15 /etc/group
122 2024-12-03 02:27:43 sudo usermod -aG research mycroft
123 2024-12-03 02:28:02 tail -15 /etc/group
124 2024-12-03 02:29:22 sudo deluser mycroft marketing
```

sudo deluser mycroft marketing

```
123 2024-12-03 02:28:02 tail -15 /etc/group
124 2024-12-03 02:30:33 sudo deluser mycroft marketing
125 2024-12-03 02:31:42 tail -15 /etc/group
```

		<p>e. Remove marketing group</p> <p><i>sudo delgroup marketing</i></p> <pre>125 2024-12-03 02:31:42 tail -15 /etc/group 126 2024-12-03 02:32:08 sudo delgroup marketing 127 2024-12-03 02:32:16 tail -15 /etc/group 128 2024-12-03 02:36:01 sudo nano /etc/pam.d/common-password</pre>
•	Updating and enforcing password policies	<p><i>sudo nano /etc/pam.d/common-password</i></p> <pre>128 2024-12-03 02:36:01 sudo nano /etc/pam.d/common-password 129 2024-12-03 02:44:59 sudo nano /etc/pam.d/common-password</pre> <pre># here are the per-package modules (the "Primary" block) password [success=1 default=ignore] pam_unix.so obscure yescrypt password requisite pam_pwquality.so minlen=8 ocrediet=-1 retry=2 ucrediet=-1 password required pam_unix.so # here's the fallback if no module succeeds</pre> <p><i>cat /etc/shadow</i></p> <pre>:ec2-instance:connect:::19993:::: chrony:!::19993:::: ubuntu:!::20018:0:99999:7::: sysadmin:\$sys\$9tSy5nyiKCr6hWMrzX999c/\$WtLVqOXjHyejw/YD3rna0wrrvkn0Q4fwDcfxWvj9wsB:20018:0:99999:7::: sherlock:\$sys\$9tSy5nyiKCr6hWMrzX999c/\$WtLVqOXjHyejw/YD3rna0wrrvkn0Q4fwDcfxWvj9wsB:20018:0:99999:7::: watson:\$sys\$9T\$1Xq4xg30CPuFFv9ZWjug8/\$CoTk253eWAaE/7ChaPiBm9ggoJ14yAqJJz15tzN.U.:20018:0:99999:7::: moriarty:\$sys\$9T\$8xH.cxMRyMYWUfmFfQ681.\$BXMmzQWrccDvDjhbjna1kbtMw980XtJb9YazuAhC9:20018:0:99999:7::: mycroft:\$sys\$9T\$FGTw.R.LTUqxneu31T///\$.NAK6Z/d/CoshBifS2qUKdtTl/RAftEjHTGCOm6p000:20018:0:99999:7::: mrs_hudson:!::20018:0:99999:7::: toby:password:20060:0:99999:7::: adler:\$6\$Vllvd8FlgJuCRlIU\$KPr4lw1R0ItBUxpapCSDV0mFnXBELkEVRARHgAGMrSmk8NaH9VWSQbLFR5SGVwBzfwelWdhMRUpBe3GKGgrm21:20061:0:99999:7::: mysql:!::20018::::: root@ip-172-22-117-108:/home/sysadmin#</pre> <p>Password changed but unable to switch user to confirm policy being enforced.</p>

-

Updating and enforcing sudo permissions

1. Full sudo privileges to Sherlock only:
Check sudoers file:

```
cat /etc/sudoers
```

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

@includedir /etc/sudoers.d
sysadmin ALL=(ALL:ALL) ALL
sysadmin ALL=(ALL:ALL) ALL
sherlock ALL=(ALL) NOPASSWD:ALL
Watson ALL=(ALL) NOPASSWD:ALL
moriarty ALL=(ALL) NOPASSWD:ALL
sysadmin ALL=(ALL:ALL) ALL
```

```
sudo visudo
```

```
132 2024-12-03 02:57:28 sudo visudo
133 2024-12-03 03:08:30 sudo visudo
```

Leave only Sherlock with full sudo privileges:

```
sherlock ALL=(ALL) NOPASSWD:ALL
```

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

@includedir /etc/sudoers.d
sysadmin ALL=(ALL:ALL) ALL
sysadmin ALL=(ALL:ALL) ALL
sherlock ALL=(ALL) NOPASSWD:ALL
sysadmin ALL=(ALL:ALL) ALL
```

2. Grant watson and Mycroft sudo privileges to run below script:

```
watson ALL=(ALL) NOPASSWD: /var/log/logcleanup.sh
```

```
mycroft ALL=(ALL) NOPASSWD: /var/log/logcleanup.sh
```

```
# See sudoers(5) for more information on "@include" directives:  
  
@includedir /etc/sudoers.d  
sysadmin ALL=(ALL:ALL) ALL  
sysadmin ALL=(ALL:ALL) ALL  
sherlock ALL=(ALL) NOPASSWD:ALL  
sysadmin ALL=(ALL:ALL) ALL  
watson ALL=(ALL) NOPASSWD: /var/log/logcleanup.sh  
mycroft ALL=(ALL) NOPASSWD: /var/log/logcleanup.sh  
mycroft ALL=(ALL) NOPASSWD: /tmp/scripts/research_script.sh
```

3. Grant all employees in research group sudo privileges to run the below script:

```
mycroft ALL=(ALL) NOPASSWD: /tmp/scripts/research_script.sh
```

```
# See sudoers(5) for more information on "@include" directives:  
  
@includedir /etc/sudoers.d  
sysadmin ALL=(ALL:ALL) ALL  
sysadmin ALL=(ALL:ALL) ALL  
sherlock ALL=(ALL) NOPASSWD:ALL  
sysadmin ALL=(ALL:ALL) ALL  
watson ALL=(ALL) NOPASSWD: /var/log/logcleanup.sh  
mycroft ALL=(ALL) NOPASSWD: /var/log/logcleanup.sh  
mycroft ALL=(ALL) NOPASSWD: /tmp/scripts/research_script.sh
```

<ul style="list-style-type: none"> • Validating and updating permissions on files and directories 	<p>1.</p> <pre>find -perm /o+rwx -exec chmod o-rwx {} +</pre> <pre>adler moriarty mrs_hudson mycroft sherlock sysadmin toby ubuntu watson root@ip-172-22-117-107:/home# cd mycroft root@ip-172-22-117-107:/home/mycroft# ls Engineering_script.sh_0.txt Finance_script.sh_script1.sh deduction.doc_1.txt Finance_script.sh_3.txt Finance_script.sh_script2.sh deduction.doc_2.txt root@ip-172-22-117-107:/home/mycroft# chmod o- Engineering_script.sh_0.txt Finance_script.sh_3.txt Finance_script.sh_script1.sh Finance_ script.sh script2.sh deduction.doc_1.txt deduction.doc_2.txt root@ip-172-22-117-107:/home/mycroft# cd .. root@ip-172-22-117-107:/home# cd sherlock root@ip-172-22-117-107:/home/sherlock# ls deduction.doc_3.txt deduction.doc_script2.sh game_is_afoot.txt_1.txt my_file.txt deduction.doc_script1.sh elementary.txt_0.txt game_is_afoot.txt_2.txt root@ip-172-22-117-107:/home/sherlock# chmod o= deduction.doc_3.txt deduction.doc_script1.sh deduction.doc_script2.sh elementary.txt_0. txt game_is_afoot.txt_1.txt game_is_afoot.txt_2.txt my_file.txt root@ip-172-22-117-107:/home/sherlock# cd .. root@ip-172-22-117-107:/home# cd toby root@ip-172-22-117-107:/home/toby# ls Engineering_script.sh_2.txt elementary.txt_0.txt elementary.txt_script1.sh deduction.doc_1.txt elementary.txt_3.txt elementary.txt_script2.sh root@ip-172-22-117-107:/home/toby# chmod o= Engineering_script.sh_2.txt deduction.doc_1.txt elementary.txt_0.txt elementary.txt_3.txt e lementary.txt script1.sh elementary.txt script2.sh root@ip-172-22-117-107:/home/toby# cd .. root@ip-172-22-117-107:/home# cd watson root@ip-172-22-117-107:/home/watson# ls I Finance_script.sh_3.txt Finance_script.sh_script2.sh deduction.doc_1.txt my_file.txt Finance_script.sh_script1.sh deduction.doc_0.txt deduction.doc_2.txt root@ip-172-22-117-107:/home/watson# chmod o= Finance_script.sh_3.txt Finance_script.sh_script1.sh Finance_script.sh_script2.sh deduction .doc_0.txt deduction.doc_1.txt deduction.doc_2.txt my_file.txt</pre> <p>2.</p> <ol style="list-style-type: none"> finds all script files and text files, that could be scripts and changes perms to only group can rwx <pre>find /home -type f -iname *"Engineering"*"sh" xargs chmod 070</pre> <p>Changing group ownership of the files to engineering</p> <pre>find /home -type f -iname *"Engineering"*"sh" xargs chown :engineering</pre> <ol style="list-style-type: none"> Finding files for research <pre>find /home -type f -iname *"Research"*"sh" xargs chmod 070</pre> <p>Changing group ownership:</p> <pre>find /home -type f -iname *" Research"*"sh" xargs chown :Research</pre> <ol style="list-style-type: none"> Finding files for finance
--	---

```
find /home -type f -iname *"Finance"*"sh" | xargs chmod 070
```

Changing ownership

```
find /home -type f -iname *"Finance"*"sh" | xargs chown :finance
```

```
89 2024-12-03 04:02:52 history
90 2024-12-04 00:48:49 find /home -type f -iname *"Engineering"*"sh" | xargs chmod 070
91 2024-12-04 00:50:42 find /home -type f -iname *"Engineering"*"sh" | xargs chown :engineers
92 2024-12-04 00:51:02 find /home -type f -iname *"Engineering"*"sh" | xargs chown :Engineers
93 2024-12-04 00:51:28 groups
94 2024-12-04 00:52:27 find /home -type f -iname *"Engineering"*"sh" | xargs chown :engineering
95 2024-12-04 00:54:40 find /home -type f -iname *"Research"*"sh" | xargs chmod 070
96 2024-12-04 01:00:43 find /home -type f -iname *"Research"*"sh" | xargs chown :finance
97 2024-12-04 01:01:19 find /home -type f -iname *"Research"*"sh" | xargs chown :research
98 2024-12-04 01:04:14 find /home -type f -iname *"Research"*"sh"
99 2024-12-04 01:04:59 ..\
100 2024-12-04 01:06:10 history
root@ip-172-22-117-107:/home/sysadmin# find /home -type f -iname *"Finance"*"sh"
/home/watson/Finance_script.sh_script2.sh
/home/watson/Finance_script.sh_script1.sh
/home/mycroft/Finance_script.sh_script2.sh
/home/mycroft/Finance_script.sh_script1.sh
root@ip-172-22-117-107:/home/sysadmin# find /home -type f -iname *"Finance"*"sh" | xargs chmod 070
root@ip-172-22-117-107:/home/sysadmin# find /home -type f -iname *"Finance"*"sh" | xargs chown :Finance
chown: invalid group: ':Finance'
root@ip-172-22-117-107:/home/sysadmin# find /home -type f -iname *"Finance"*"sh" | xargs chown :finance
root@ip-172-22-117-107:/home/sysadmin# find /home -type f -iname *"Engineering"*"sh"
/home/adler/Engineering_script.sh_script2.sh
/home/adler/Engineering_script.sh_script1.sh
root@ip-172-22-117-107:/home/sysadmin# find /home -type f -iname *"Research"*"sh"
root@ip-172-22-117-107:/home/sysadmin#
```

3. Look for .txt files with passwords then delete them:
Ran tree to look for the files then deleted them:

		<pre> RaD01 Project ├── elementary.txt_3.txt ├── elementary.txt_script1.sh └── elementary.txt_script2.sh ├── mycroft │ ├── deduction_engineering_script.sh_0.txt │ ├── Finance_script.sh_0.txt │ ├── Finance_script.sh_script1.sh │ ├── Finance_script.sh_script2.sh │ ├── deduction.doc_1.txt │ └── deduction.doc_2.txt ├── shakespeare │ ├── deduction.doc_3.txt │ ├── deduction_doc_script1.sh │ ├── deduction_doc_script2.sh │ ├── elementary.txt_0.txt │ ├── game_is_afoot.txt_1.txt │ ├── game_is_afoot.txt_2.txt │ └── my_file.txt └── watsontest ├── Engineering_script.sh_2.txt ├── deduction.txt_0.txt ├── elementary.txt_3.txt ├── elementary.txt_script1.sh └── elementary.txt_script2.sh └── ubuntu ├── Finance_script.sh_3.txt ├── Finance_script.sh_script1.sh ├── Finance_script.sh_script2.sh ├── deduction.doc_0.txt ├── deduction.doc_1.txt └── deduction.doc_2.txt └── my_file.txt 16 directories, 45 files root@ip-172-22-117-89:/home# cat moriarty/my_file.txt user1: Password123 user2: query1y0M user3: letmein56 root@ip-172-22-117-89:/home# cd moriarty/ root@ip-172-22-117-89:/home/moriarty# ./moriarty root@ip-172-22-117-89:/home/moriarty# rm my_file.txt root@ip-172-22-117-89:/home# ls -l total 8 -rw-r--r-- 1 moriarty finance 0 Oct 22 16:35 Finance_script.sh_0.txt -rw-r--r-- 1 moriarty finance 0 Oct 22 16:35 Finance_script.sh_2.txt -rw-r--r-- 1 moriarty moriarty 0 Oct 22 16:35 elementary.txt_1.txt -rw-r--r-- 1 moriarty moriarty 0 Oct 22 16:35 elementary.txt_2.txt -rwxr-x--- 1 moriarty moriarty 49 Oct 22 16:35 game_is_afoot.txt_script1.sh -rwxr-x--- 1 moriarty moriarty 49 Oct 22 16:35 game_is_afoot.txt_script2.sh root@ip-172-22-117-89:/home/moriarty# rm deduction.doc_1.txt root@ip-172-22-117-89:/home# cat sherlock/my_file.txt user1: Password123 user2: query1y0M user3: letmein56 root@ip-172-22-117-89:/home# cd sherlock/ root@ip-172-22-117-89:/home/sherlock# rm my_file.txt root@ip-172-22-117-89:/home/sherlock# cd .. root@ip-172-22-117-89:/home# cat watson/my_file.txt user1: Password123 user2: query1y0M user3: letmein56 root@ip-172-22-117-89:/home# rm Watson/my_file.txt root@ip-172-22-117-89:/home# rm</pre>
•	Optional: Updating password hashing configuration	<p>Edit PAM Password Settings:</p> <p><i>sudo nano /etc/pam.d/common-password</i></p> <p><i>password required pam_unix.so sha512 remember=5</i></p>

- Auditing and securing SSH

1. Configure SSH to **NOT** allow the ability to
 - a. No SSH with empty passwords

```
# 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
```

- b. No SSH with root user

```
GNU nano 7.2
/etc/ssh/sshd_config *

# 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
#AuthorizedKeysCommand none
#AuthorizedKeysCommandUser nobody
```

c. SSH with no other ports apart from 22

```
GNU nano 7.2                                         /etc/ssh/sshd_config *

# 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
```

2. Enable SSH protocol 2

```
# 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
Protocol 2

# Do not change
AllowUsers sherlock watson moriarty mycroft irene lestrade sysadmin
```

```
root@ip-172-22-117-108:/home/sysadmin# sudo █
```

3. Edit the SSH Server Config File

```
GNU nano 7.2                                         /etc/ssh/sshd_config *

# 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
```

4. Restart the SSH service to set your updates

```
sudo systemctl restart sshd
```

```
root@ip-172-22-117-108:/home/sysadmin# sudo systemctl restart ssh
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin# █
```

<ul style="list-style-type: none"> • Reviewing and updating system packages 	<ol style="list-style-type: none"> 1. Ran <code>apt update</code> <p><i>apt update</i></p> <pre>root@ip-172-22-117-108:/home/sysadmin# apt update Hit:1 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble InRelease Get:2 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB] Get:3 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB] Get:4 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [673 kB] Get:5 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [158 kB] Get:6 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [131 kB] Get:7 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [720 kB] Get:8 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [214 kB] Get:9 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [310 kB] Get:10 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 kB] Get:11 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse Translation-en [3964 B] Get:12 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B] Get:13 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [208 B] Get:14 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [11.7 kB] Get:15 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [216 B] Get:16 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 kB] Get:17 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB] Get:18 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [498 kB] Get:19 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [102 kB] Get:20 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [7236 B] Get:21 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [563 kB] Get:22 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [150 kB] Get:23 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [51.9 kB] Get:24 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [208 B] Get:25 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [212 B] Fetched 3974 kB in 4s (1121 kB/s) Reading package lists... Done Building dependency tree... Done Reading state information... Done 42 packages can be upgraded. Run 'apt list --upgradable' to see them. root@ip-172-22-117-108:/home/sysadmin#</pre> <ol style="list-style-type: none"> 2. Ran <code>apt upgrade -y</code> <p><i>sudo apt upgrade -y</i></p>
--	---

```
Processing triggers for initramfs-tools (0.142ubuntu0.4) ...
update-initramfs: Generating /boot/initrd.img-6.8.0-1019-aws
Scanning processes...
Scanning candidates...
Scanning linux images...

Running kernel seems to be up-to-date.

Restarting services...
/etc/needrestart/restart.d/systemd-manager
systemctl restart cron.service inetd.service nmbd.service packagekit.service smbd.service
networkd.service systemd-resolved.service systemd-udevd.service udisks2.service

Service restarts being deferred:
/etc/needrestart/restart.d/dbus.service
systemctl restart systemd-logind.service

No containers need to be restarted.

User sessions running outdated binaries:
sysadmin @ session #1: sshd[1074]
sysadmin @ user manager service: systemd[1079]

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-22-117-107:~#
```

3. Create the file called package_list.txt

```
apt list --installed >>package_list.txt
```

```
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin# apt list --installed >>package_list.txt
WARNING: apt does not have a stable CLI interface. Use with caution in scripts.
root@ip-172-22-117-108:/home/sysadmin#
```

```
Last login: Wed Dec  4 01:23:46 2024 from 172.22.118.75
sysadmin@ip-172-22-117-108:~$ sudo su
[sudo] password for sysadmin:
root@ip-172-22-117-108:/home/sysadmin# ls -l
total 60
-rw-r--r-- 1 root root 51090 Dec  4 02:03 pakage_list.txt
-rwxr-xr-x 1 root root    283 Dec  1 21:53 system_info
-rw----- 1 root root     14 Dec  1 21:51 system_info.save
root@ip-172-22-117-108:/home/sysadmin#
```

4. ID named packages: telnet & rsh-client

```
apt list --installed | grep telnet && rsh-client
```

```
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin# apt list --installed | grep telnet && rsh-client
WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

inetutils-telnet/noble,now 2:2.5-3ubuntu4 amd64 [installed,automatic]
telnet/noble,now 0.17+2.5-3ubuntu4 all [installed]
rsh-client: command not found
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin#
```

5. Removing the packages

```
apt autoremove -y telnet
```

```
root@ip-172-22-117-108:/home/sysadmin# apt autoremove -y telnet
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages will be REMOVED:
  telnet
0 upgraded, 0 newly installed, 1 to remove and 0 not upgraded.
After this operation, 48.1 kB disk space will be freed.
(Reading database ... 103522 files and directories currently installed.)
Removing telnet (0.17+2.5-3ubuntu4) ...
root@ip-172-22-117-108:/home/sysadmin#
```

apt autoremove -y inetutils-telnet

```
root@ip-172-22-117-108:/home/sysadmin# apt autoremove -y inetutils-telnet
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages will be REMOVED:
  inetutils-telnet
0 upgraded, 0 newly installed, 1 to remove and 0 not upgraded.
After this operation, 247 kB disk space will be freed.
(Reading database ... 103516 files and directories currently installed.)
Removing inetutils-telnet (2:2.5-3ubuntu4) ...
Processing triggers for man-db (2.12.0-4build2) ...
root@ip-172-22-117-108:/home/sysadmin#
```

no rsh-client package installed

```
root@ip-172-22-117-107:~# apt search rsh-client
Sorting... Done
Full Text Search... Done
root@ip-172-22-117-107:~#
```

telnet and rsh-client are insecure because they use unencrypted communication as well as have weak authentication mechanisms. This makes them prone to man-in-the-middle attacks.

Install new packages

apt install tripwire

```
root@ip-172-22-117-108:/home/sysadmin# apt install tripwire
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libns1 postfix ssl-cert
Suggested packages:
  mail-reader postfix-cdb postfix-doc postfix-ldap postfix-lmdb postfix-mta-sts-resolver postfix-mysql postfix-pcre postfix-pgsql postfix-sqlite procmail sasl2-bin | dovecot-common
The following NEW packages will be installed:
  libns1 postfix ssl-cert tripwire
0 upgraded, 4 newly installed, 0 to remove and 0 not upgraded.
Need to get 2193 kB of archives.
After this operation, 7805 kB of additional disk space will be used.
Do you want to continue? [Y/n] █
```

apt install ufw

```
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin# apt install ufw
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
ufw is already the newest version (0.36.2-6).
ufw set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@ip-172-22-117-108:/home/sysadmin# █
```

apt install lynis

```
root@ip-172-22-117-108:/home/sysadmin# apt install lynis
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  menu
Suggested packages:
  apt-listbugs debsecan debsums tripwire samhain aide fail2ban menu-l10n gksu | kde-cli-tools | ktsuss
The following NEW packages will be installed:
  lynis menu
0 upgraded, 2 newly installed, 0 to remove and 0 not upgraded.
Need to get 602 kB of archives.
After this operation, 3202 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 lynis all 3.0.9-1 [226 kB]
Get:2 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 menu amd64 2.1.50 [377 kB]
Fetched 602 kB in 0s (23.7 MB/s)
Selecting previously unselected package lynis.
(Reading database ... 103509 files and directories currently installed.)
Preparing to unpack .../archives/lynis_3.0.9-1_all.deb ...
Unpacking lynis (3.0.9-1) ...
Selecting previously unselected package menu.
Preparing to unpack .../archives/menu_2.1.50_amd64.deb ...
Unpacking menu (2.1.50) ...
Setting up lynis (3.0.9-1) ...
Created symlink /etc/systemd/system/timers.target.wants/lynis.timer → /usr/lib/systemd/system/lynis.timer.
lynis.service is a disabled or a static unit, not starting it.
Setting up menu (2.1.50) ...
Processing triggers for install-info (7.1-3build2) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for menu (2.1.50) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-22-117-108:/home/sysadmin#
```

Hardening features that ufw, lynis, and tripwire can provide:

UFW – it can be configured with various rules and policies to harden a system including default deny policy, specific port allowance, IP address blocking, and logging.

Lynis – Its features include security audits and compliance checks, vulnerable software detection, malware root detection, as well as scheduling audits and continuous monitoring.

		Tripwire – It helps in file integrity monitoring. Achieved through intrusion detection, change detection, providing details change reports, customizable policies and well as file integrity monitoring which is done regularly.
●	Disabling unnecessary services	<p>1. List all services and output to service_list.txt</p> <pre>systemctl -t service >> service_list.txt</pre> <div style="background-color: black; color: white; padding: 10px;"> <pre>root@ip-172-22-117-108:/home/sysadmin# root@ip-172-22-117-108:/home/sysadmin# root@ip-172-22-117-108:/home/sysadmin# systemctl -t service >> service_list.txt root@ip-172-22-117-108:/home/sysadmin# root@ip-172-22-117-108:/home/sysadmin# root@ip-172-22-117-108:/home/sysadmin# ls -l total 68 -rw-r--r-- 1 root root 51090 Dec 4 02:03 pakage_list.txt -rw-r--r-- 1 root root 7794 Dec 4 02:38 service_list.txt -rwxr-xr-x 1 root root 283 Dec 1 21:53 system_info -rw----- 1 root root 14 Dec 1 21:51 system_info.save root@ip-172-22-117-108:/home/sysadmin#</pre> </div> <p>2. Confirm services</p> <pre>grep -i "mysql" service_list.txt grep -i "samba" service_list.txt</pre>

```
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin# systemctl -t service >> service_list.txt
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin# ls -l
total 68
-rw-r--r-- 1 root root 51090 Dec  4 02:03 pakage_list.txt
-rw-r--r-- 1 root root  7794 Dec  4 02:38 service_list.txt
-rwxr-xr-x 1 root root   283 Dec  1 21:53 system_info
-rw----- 1 root root    14 Dec  1 21:51 system_info.save
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin# grep -i "mysql" service_list.txt
  mysql.service                      loaded active    running      MySQL Community Server
root@ip-172-22-117-108:/home/sysadmin# grep -i "samba" service_list.txt
  nmbd.service                      loaded active    running      Samba NMB Daemon
  smbd.service                      loaded active    running      Samba SMB Daemon
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin#
```

3. Execute services

i.

```
systemctl stop mysql.service
```

```
systemctl disable mysql.service
```

```
sudo apt-get remove --purge mysql-server mysql-client mysql-common
```

```
447 2024-12-04 02:45:16 systemctl stop mysql.service
448 2024-12-04 02:45:50 systemctl disable mysql.service
449 2024-12-04 02:48:44 systemctl status mysql.service
```

```
root@ip-172-22-117-108:/home/sysadmin# sudo apt-get remove --purge mysql-server mysql-client mysql-common
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Package 'mysql-client' is not installed, so not removed
The following packages were automatically installed and are no longer required:
  libavahi-client3 libavahi-common-data libavahi-common3 libboost-iostreams1.83.0 libboost-thread1.83.0 libcephfs2 libcgil-fast-perl libcgil-pm-perl libclone-perl libcurl2t64
  libencode-locale-perl libevent-pthreads-2.1-7t64 libfcgi-bin libfcgi-perl libfcgi0t64 libhtml-parser-perl libhtml-tagset-perl libhtml-template-perl libhttp-date-perl
  libhttp-message-perl libio-html-perl libltdb2 liblwp-mediatypes-perl libmecab2 libprotobuf-lite32t64 librados2 librbdmacm1t64 libtalloc2 libtdb1 libtevent0t64 liburi-perl liburing2
  libwclient0 mecab-ipadic mecab-ipadic-utf8 mecab-utils mysql-client-core-8.0 mysql-server-core-8.0 python3-dnspython python3-gpg python3-ldb python3-markdown python3-samba
  python3-talloc python3-tdb samba-ad-provision samba-common samba-common-bin samba-dsdb-modules samba-libs samba-vfs-modules tdb-tools
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  mysql-client-8.0* mysql-common* mysql-server* mysql-server-8.0*
0 upgraded, 0 newly installed, 4 to remove and 0 not upgraded.
After this operation, 1752 kB disk space will be freed.
Do you want to continue? [Y/n] y
(Reading database ... 103935 files and directories currently installed.)
Removing mysql-server (8.0.40-0ubuntu0.24.04.1) ...
Removing mysql-server-8.0 (8.0.40-0ubuntu0.24.04.1) ...
update-alternatives: using /etc/mysql/my.cnf.fallback to provide /etc/mysql/my.cnf (my.cnf) in auto mode
Removing mysql-client-8.0 (8.0.40-0ubuntu0.24.04.1) ...
Removing mysql-common (5.8+1.1.0build1) ...
Processing triggers for man-db (2.12.0-4build2) ...
(Reading database ... 103889 files and directories currently installed.)
Purging configuration files for mysql-server-8.0 (8.0.40-0ubuntu0.24.04.1) ...
Purging configuration files for mysql-common (5.8+1.1.0build1) ...
dpkg: warning: while removing mysql-common, directory '/etc/mysql' not empty so not removed
root@ip-172-22-117-108:/home/sysadmin#
```

ii.

systemctl stop nmbd.service

systemctl disable nmbd.service

sudo apt remove nmbd.service

iii.

systemctl stop smbd.service

systemctl disable smbd.service

sudo apt remove smbd.service

sudo apt remove samba

		<pre>451 2024-12-04 02:52:05 systemctl stop nmbd.service 452 2024-12-04 02:52:29 systemctl stop smbd.service 453 2024-12-04 02:53:03 systemctl disable nmbd.service 454 2024-12-04 02:53:20 systemctl disable smbd.service 455 2024-12-04 03:01:12 clear 456 2024-12-04 03:03:21 sudo apt remove nmbd.service 457 2024-12-04 03:03:42 sudo apt remove smbd.service 458 2024-12-04 03:06:18 dpkg -l grep samba 459 2024-12-04 03:08:14 systemctl disable smbd 460 2024-12-04 03:08:37 sudo apt remove samba 461 2024-12-04 03:10:45 systemctl status samba</pre>
•	Enabling and configuring logging	<pre>cat /etc/systemd/journald.conf [Journal] # ... [Log] # ... [Service] # ... [Install] # ... 462 2024-12-04 03:12:25 nano /etc/systemd/journald.conf</pre>

```
root@ip-172-22-117-108:/home/sysadmin# cat /etc/systemd/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 a copy of it placed in
# /etc/ if the original file is shipped in /usr/), or by creating "drop-ins" in
# the /etc/systemd/journald.conf.d/ directory. The latter is generally
# recommended. Defaults can be restored by simply deleting the main
# configuration file and all drop-ins located in /etc/.
#
# 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=
#SystemKeepFree=
#SystemMaxFileSize=
#SystemMaxFiles=100
#RuntimeMaxUse=300M
#RuntimeKeepFree=
#RuntimeMaxFileSize=
#RuntimeMaxFiles=100
#MaxRetentionSec=
#MaxFileSec=1month
#ForwardToSyslog=no
#ForwardToKMsg=no
#ForwardToConsole=no
#ForwardToWall=yes
#TTYPath=/dev/console
#MaxLevelStore=debug
#MaxLevelSyslog=debug
#MaxLevelKMsg=notice
```

```
#  
# 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=  
#SystemKeepFree=  
#SystemMaxFileSize=  
#SystemMaxFiles=100  
RuntimeMaxUse=300M  
#RuntimeKeepFree=  
#RuntimeMaxFileSize=  
#RuntimeMaxFiles=100  
#MaxRetentionSec=  
#MaxFileSec=1month  
#ForwardToSyslog=no  
#ForwardToKMsg=no  
#ForwardToConsole=no  
#ForwardToWall=yes  
#TTYPath=/dev/console  
#MaxLevelStore=debug  
#MaxLevelSyslog=debug  
#MaxLevelKMsg=notice  
#MaxLevelConsole=info  
#MaxLevelWall=emerg  
#LineMax=48K  
#ReadKMsg=yes  
#Audit=yes  
root@ip-172-22-117-108:/home/sysadmin#  
root@ip-172-22-117-108:/home/sysadmin# █
```

```
cat /etc/logrotate.conf
```

```
root@ip-172-22-117-108:/home/sysadmin# cat /etc/logrotate.conf
# see "man logrotate" for details

# global options do not affect preceding include directives

# rotate log files daily
daily

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

# keep 7 days 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.
root@ip-172-22-117-108:/home/sysadmin# █
```

Ran `systemctl restart systemd-journald` to restart the service

•	Scripts created	<p>Scripts created:</p> <pre>root@ip-172-22-117-108:/# cd scripts/ root@ip-172-22-117-108:/scripts# ls -l total 8 -rwxr-x--- 1 root root 3572 Dec 6 03:33 hardening_script1.sh -rwxr-x--- 1 root root 1293 Dec 6 03:34 hardening_script2.sh root@ip-172-22-117-108:/scripts#</pre> <p>Hardening_script1.sh</p> <pre>#!/bin/bash # Variable for the report output file, choose an output file name REPORT_FILE="/Monthly_Report" # 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: \$(cat /etc/os-release)" >> \$REPORT_FILE printf "\n" >> \$REPORT_FILE # Output memory information echo "Gathering memory information..." # Placeholder for command to get memory info echo "Memory Information: \$(free -h)" >> \$REPORT_FILE printf "\n" >> \$REPORT_FILE</pre>
---	-----------------	--

```
# 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 --exclude=/tmp --exclude=/mnt --exclude=/sys --exclude=/dev --exclude=/run /

echo "OS backup completed." >> $REPORT_FILE
printf "\n" >> $REPORT_FILE

# Force Sherlock, Watson, and Mycroft to change their password upon their next login
echo "Forcing Sherlock, Watson, and Mycroft users to change their password on next login..."
# Placeholder for command to force password change

chage -d 0 sherlock
chage -d 0 watson
chage -d 0 mycroft

echo "Password change enforced for Sherlock, Watson, and Mycroft." >> $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:$(cat /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..."

    find /home -perm /o+rwx -exec chmod o-rwx {} +
# 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
find /home -type f -iname *"Engineering""*sh" | xargs 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

find /home -type f -iname *"Research"*"sh" | xargs chown :research

echo "Permissions updated for Research scripts" >> $REPORT_FILE
printf "\n" >> $REPORT_FILE

# Finance scripts - Only members of the finance group
echo "Updating permissions for Finance scripts"
# Placeholder for command to update permissions

find /home -type f -iname *"Finance"*"sh" | xargs chown :finance

echo "Permissions updated for Finance scripts." >> $REPORT_FILE
printf "\n" >> $REPORT_FILE

echo "Script execution completed. Check $REPORT_FILE for details."
```

Hardening_script2.sh

```
#!/bin/bash

# Variable for the report output file, choose a NEW output file name
REPORT_FILE="/Weekly_Report"

# 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:$(cat /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

sudo 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.conf)" >> $REPORT_FILE
printf "\n" >> $REPORT_FILE

echo "Script execution completed. Check $REPORT_FILE for details."
```

-

Scripts scheduled with cron

Scheduling scripts with cron:

The screenshot shows a terminal window titled "Base ODL-Project1" with the command "GNU nano 7.2" at the top. The window displays the contents of a crontab file. The text is as follows:

```
GNU nano 7.2
/tmp/crontab.dpxc70/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 * * /scripts/hardening_script1.sh
0 0 * * 1 /scripts/hardening_script2.sh
```

In the bottom right corner of the terminal window, there is a status bar with the following options:

File Name to Write: /tmp/crontab.dpxc70/crontab	M-D DOS Format	M-A Append
^G Help	M-M Mac Format	M-P Prepend
^C Cancel		

Confirming scripts scheduled with cron:

```
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin# crontab -l
# 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 * * /scripts/hardening_script1.sh
#
# 0 0 * * 1 /scripts/hardening_script2.sh
root@ip-172-22-117-108:/home/sysadmin#
root@ip-172-22-117-108:/home/sysadmin# █
```

script 1 is scheduled to run once a month, and on the first of the month.

script 2 is scheduled to run once a week, every Monday at 12 am.

•	Summary Report	<p>In this project, we were tasked with hardening a Linux server for The Baker Street Corporation (BSC). The objective was to audit the server's configuration and implement security measures to mitigate potential vulnerabilities.</p> <p>Key Activities and Findings</p> <p>Pre-Hardening Steps:</p> <p>Conducted a system inventory and created a backup of critical files to ensure data integrity during the hardening process.</p> <p>Auditing Users and Groups:</p> <p>Reviewed existing user accounts and groups to ensure only authorized personnel had the system access.</p> <p>Implemented the principle of least privilege by adjusting user permissions as necessary.</p> <p>Password Policy Enforcement:</p> <p>Updated password policies to enforce complexity requirements and forced users to change weak passwords upon next login.</p> <p>Updated password hashing configuration.</p> <p>Sudo Permissions:</p> <p>Validated and updated the sudoers file to restrict sudo access to a minimal number of trusted</p>
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	<p>users, ensuring that only essential tasks could be performed with elevated privileges.</p> <p>File and Directory Permissions:</p> <p>Checked and corrected permissions on sensitive files and directories, including /etc/shadow and /etc/passwd, to prevent unauthorized access.</p> <p>SSH Configuration:</p> <p>Configured SSH settings to enhance security, including disabling root login and changing the default SSH port.</p> <p>Unnecessary Services and Packages:</p> <p>Identified and removed unnecessary services and packages to reduce the attack surface of the server.</p> <p>Logging and Monitoring:</p> <p>Configured logging settings to ensure that all relevant events were recorded and could be monitored for suspicious activity.</p> <p>Automation of Hardening Tasks:</p> <p>Developed scripts to automate repetitive hardening tasks and scheduled them with cron jobs</p>
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for regular execution.

Conclusion

The hardening process significantly improved the security posture of the Linux server. By implementing the changes outlined above, the server is now better protected against potential threats and vulnerabilities. Future recommendations include regular audits and updates to the hardening measures to adapt to evolving security challenges.