Week 7 : Security Audit and System Evaluation

A comprehensive security assessment was conducted to evaluate the overall security posture of the system.

1. Security Scanning with Lynis

Command:

```
sudo lynis audit system
```

- **Explanation:**
  Performs a full security audit of the system, checking for vulnerabilities, insecure configurations, and missing security controls.

```
liveuser@localhost-live:~$ sudo lynis audit system

[ Lynis 3.1.6 ]

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  welcome to redistribute it under the terms of the GNU General Public License.
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  Enterprise support available (compliance, plugins, interface and tools)
################################################################################


[+] Initializing program
------------------------------------
  - Detecting OS...                                           [ DONE ]
  - Checking profiles...                                      [ DONE ]

  ---------------------------------------------------
  Program version:           3.1.6
  Operating system:          Linux
  Operating system name:     Fedora Linux
  Operating system version:  43
  End-of-life:               UNKNOWN
  Kernel version:            6.17.1
  Hardware platform:         x86_64
  Hostname:                  localhost-live
  ---------------------------------------------------
  Profiles:                  /etc/lynis/default.prf
  Log file:                  /var/log/lynis.log
  Report file:               /var/log/lynis-report.dat
  Report version:            1.0
```

```
vboxuser@ubuntu:~$ sudo lynis audit system
[sudo] password for vboxuser:

[ Lynis 3.0.9 ]

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################################################################################


[+] Initializing program
------------------------------------
  - Detecting OS...                                           [ DONE ]
  - Checking profiles...                                      [ DONE ]

  ---------------------------------------------------
  Program version:           3.0.9
  Operating system:          Linux
  Operating system name:     Ubuntu
  Operating system version:  24.04
  Kernel version:            6.14.0
  Hardware platform:         x86_64
  Hostname:                  ubuntu
  ---------------------------------------------------
  Profiles:                  /etc/lynis/default.prf
```

2. Network Security Assessment with Nmap

Command:

```
nmap -sS localhost
```

- **Explanation:**
  Scans the local system to identify open ports and active services that could be exposed to network attacks.

```
liveuser@localhost-live:~$ sudo nmap -sS localhost
Starting Nmap 7.92 ( https://nmap.org ) at 2025-12-14 23:54 UTC
Nmap scan report for localhost (127.0.0.1)
Host is up (0.000015s latency).
Other addresses for localhost (not scanned): ::1
Not shown: 999 closed tcp ports (reset)
PORT    STATE SERVICE
631/tcp open  ipp

Nmap done: 1 IP address (1 host up) scanned in 0.26 seconds
```

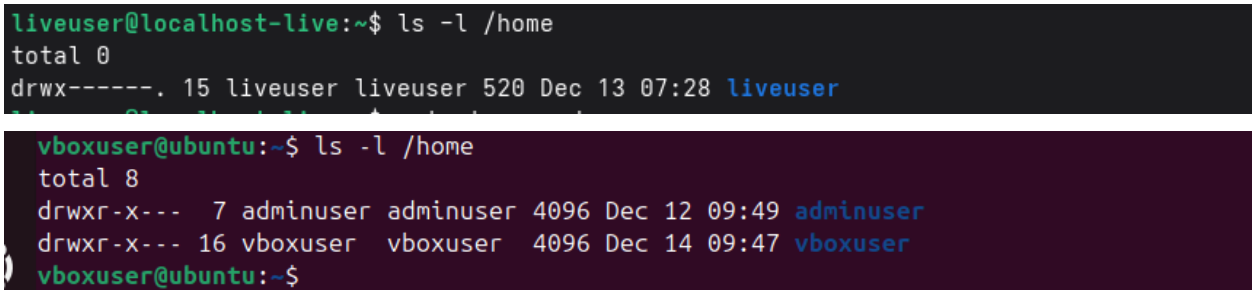
```
vboxuser@ubuntu:~$ sudo nmap -sS localhost
Starting Nmap 7.94SVN ( https://nmap.org ) at 2025-12-14 23:40 UTC
Nmap scan report for localhost (127.0.0.1)
Host is up (0.000028s latency).
Other addresses for localhost (not scanned): ::1
rDNS record for 127.0.0.1: localhost.localdomain
Not shown: 997 closed tcp ports (reset)
PORT    STATE SERVICE
22/tcp  open  ssh
80/tcp  open  http
631/tcp open  ipp

Nmap done: 1 IP address (1 host up) scanned in 0.35 seconds
```

3. Access Control Verification

Command:

```
ls -l /home
```

- **Explanation:**
  Displays file and directory permissions to verify correct access rights for users.



Command:

```
getent passwd
```

- **Explanation:**
  Lists all user accounts to ensure only authorised users exist on the system.

```
liveuser@localhost-live:~$ getent passwd
root:x:0:0:Super User:/root:/bin/bash
bin:x:1:1:bin:/bin:/usr/sbin/nologin
daemon:x:2:2:daemon:/sbin:/usr/sbin/nologin
adm:x:3:4:adm:/var/adm:/usr/sbin/nologin
lp:x:4:7:lp:/var/spool/lpd:/usr/sbin/nologin
sync:x:5:0:sync:/sbin:/bin/sync
shutdown:x:6:0:shutdown:/sbin:/sbin/shutdown
halt:x:7:0:halt:/sbin:/sbin/halt
mail:x:8:12:mail:/var/spool/mail:/usr/sbin/nologin
operator:x:11:0:operator:/root:/usr/sbin/nologin
games:x:12:100:games:/usr/games:/usr/sbin/nologin
ftp:x:14:50:FTP User:/var/ftp:/usr/sbin/nologin
nobody:x:65534:65534:Kernel Overflow User:/:/usr/sbin/nologin
dbus:x:81:81:System Message Bus:/:/usr/sbin/nologin
tss:x:59:59:Account used for TPM access:/:/usr/sbin/nologin
systemd-oom:x:999:999:systemd Userspace OOM Killer:/:/usr/sbir
```

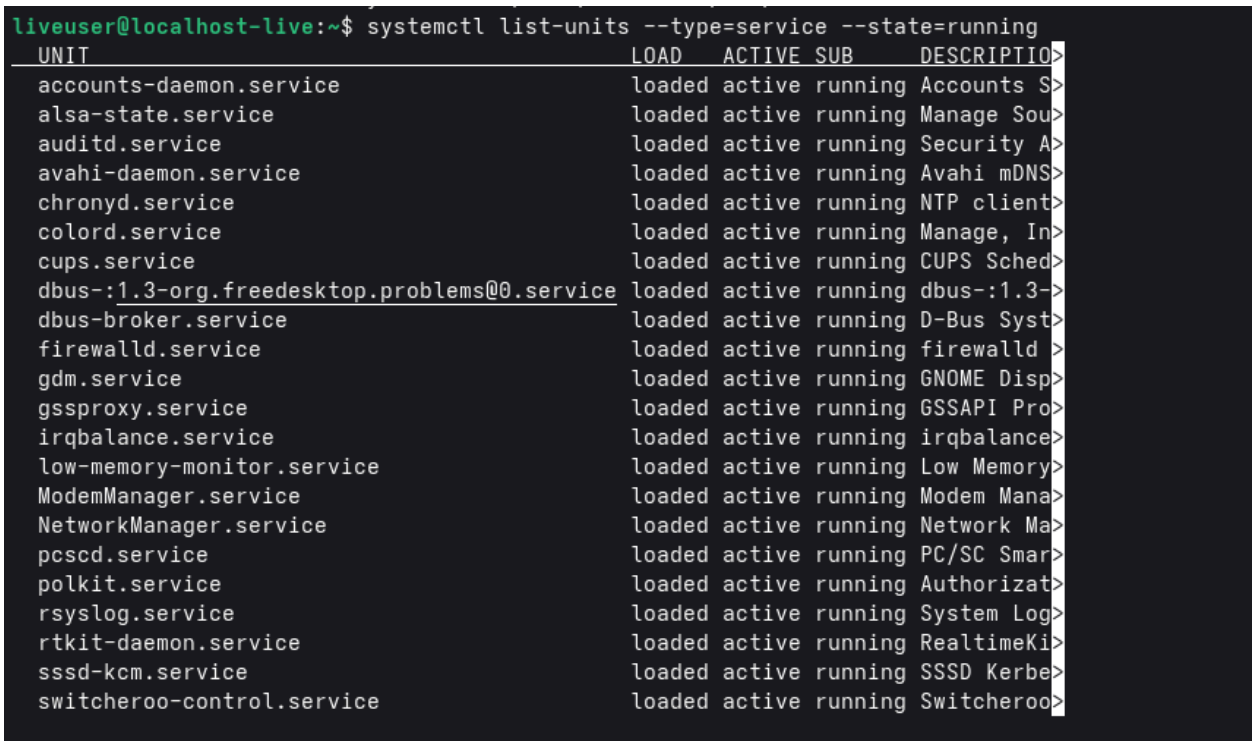
```
vboxuser@ubuntu:~$ getent passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
_apt:x:42:65534::/nonexistent:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:998:998:systemd Network Management:/:/usr/sbin/nologin
systemd-timesync:x:996:996:systemd Time Synchronization:/:/usr/sbin/nologin
dhcpcd:x:100:65534:DHCP Client Daemon,,,:/usr/lib/dhcpcd:/bin/false
messagebus:x:101:101::/nonexistent:/usr/sbin/nologin
syslog:x:102:102::/nonexistent:/usr/sbin/nologin
```

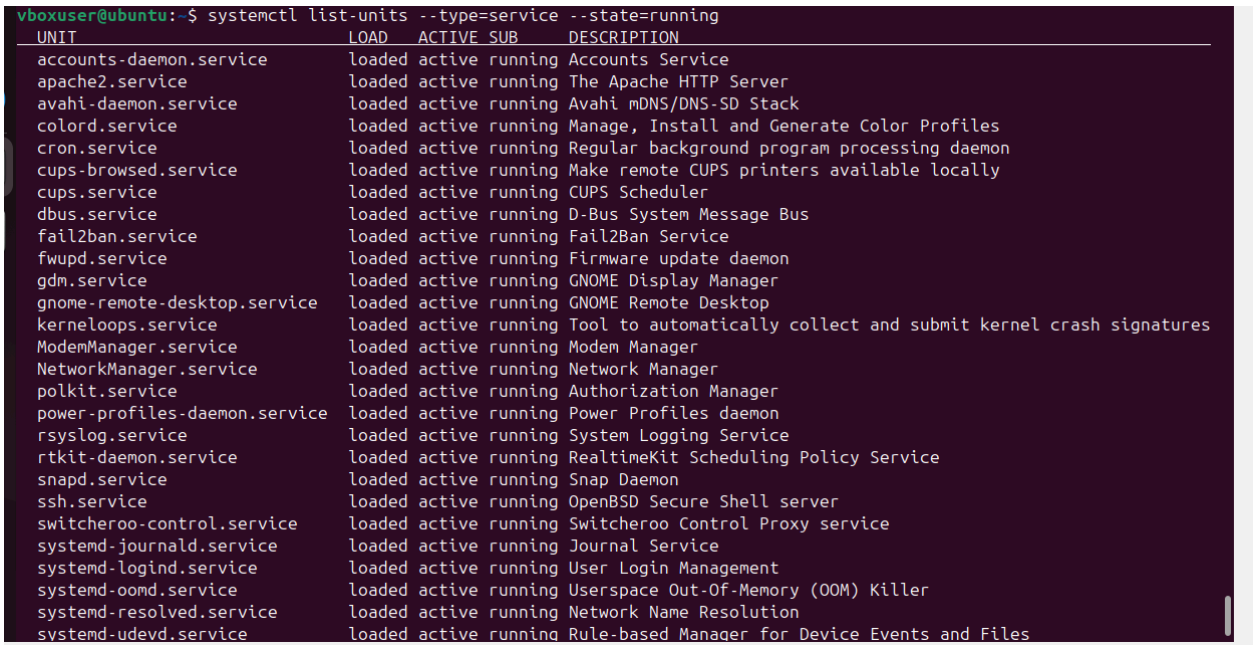
4. Service Audit (Justifying Running Services)

Command:

```
systemctl list-units --type=service --state=running
```

- **Explanation:**
  Lists all currently running services to verify that each service is required and justified.



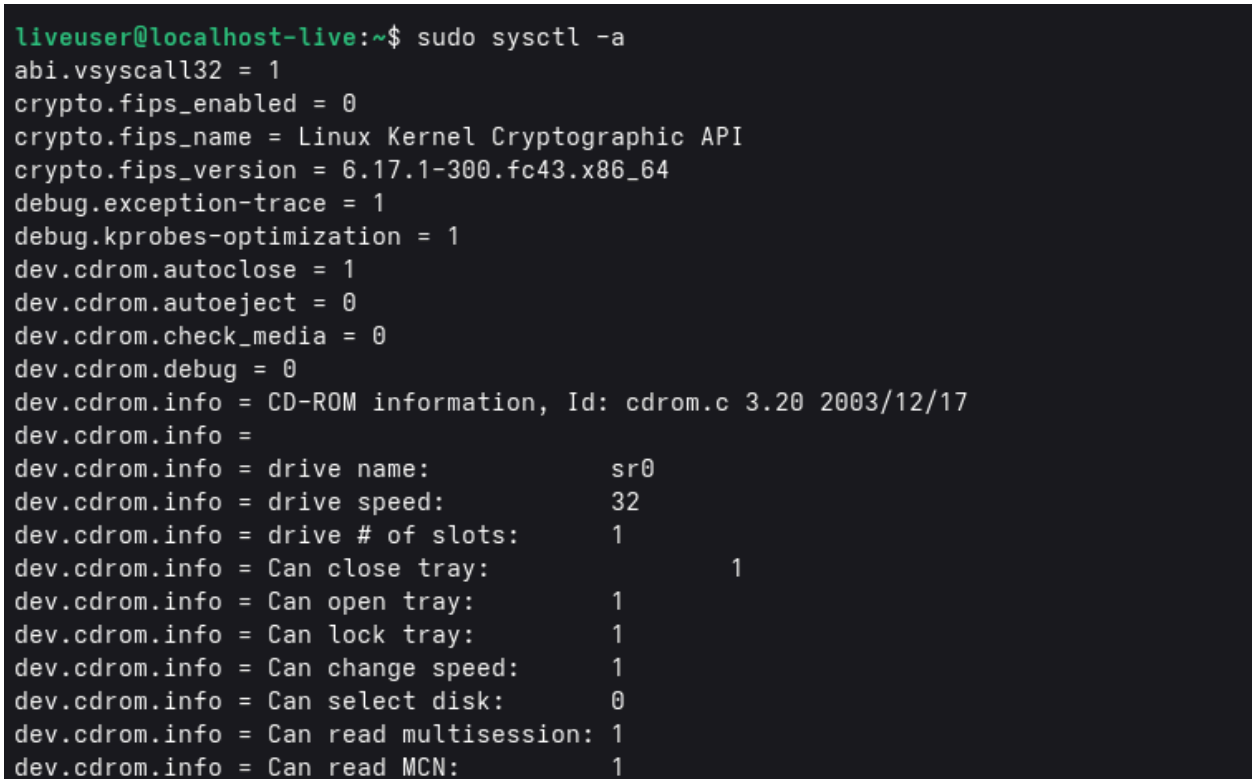
- 

5. System Configuration Review

Command:

```
sudo sysctl -a
```

- **Explanation:**
  Displays kernel configuration parameters to review system-level security settings.



```
vboxuser@ubuntu:~$ sudo sysctl -a
abi.vsyscall32 = 1
debug.exception-trace = 1
debug.kprobes-optimization = 1
dev.cdrom.autoclose = 1
dev.cdrom.autoeject = 0
dev.cdrom.check_media = 0
dev.cdrom.debug = 0
dev.cdrom.info = CD-ROM information, Id: cdrom.c 3.20 2003/12/17
dev.cdrom.info =
dev.cdrom.info = drive name:            sr0
dev.cdrom.info = drive speed:           32
dev.cdrom.info = drive # of slots:      1
dev.cdrom.info = Can close tray:                1
dev.cdrom.info = Can open tray:         1
dev.cdrom.info = Can lock tray:         1
dev.cdrom.info = Can change speed:      1
dev.cdrom.info = Can select disk:       0
dev.cdrom.info = Can read multisession: 1
dev.cdrom.info = Can read MCN:          1
dev.cdrom.info = Reports media changed: 1
dev.cdrom.info = Can play audio:                1
dev.cdrom.info = Can write CD-R:                0
dev.cdrom.info = Can write CD-RW:       0
dev.cdrom.info = Can read DVD:          1
dev.cdrom.info = Can write DVD-R:       0
```