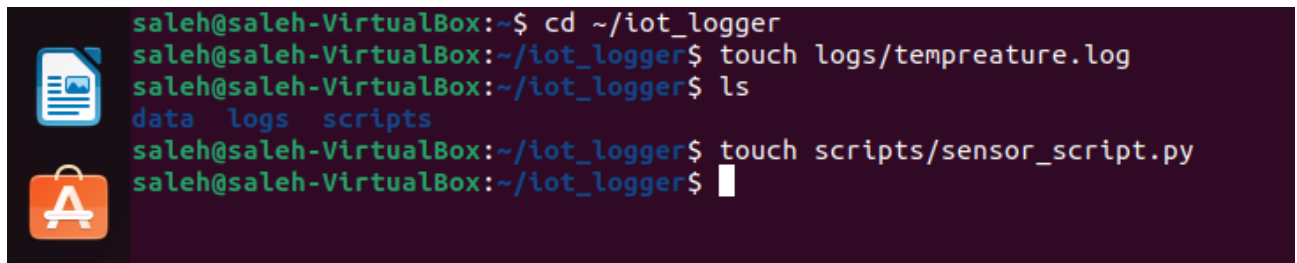


Day 2 – Phase 2 File & Directory Management + Search

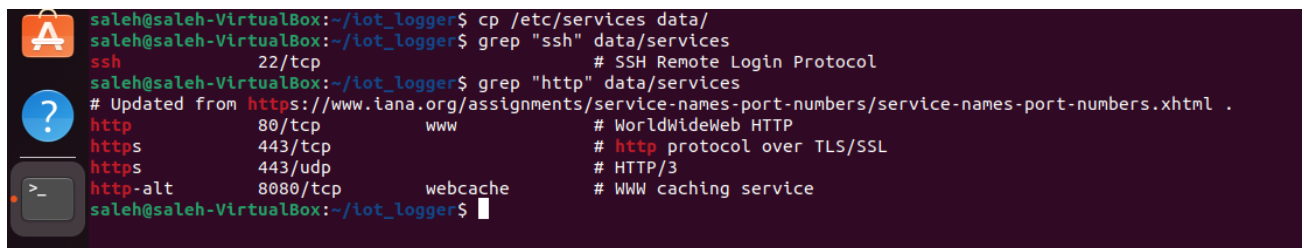
Tasks:

1.



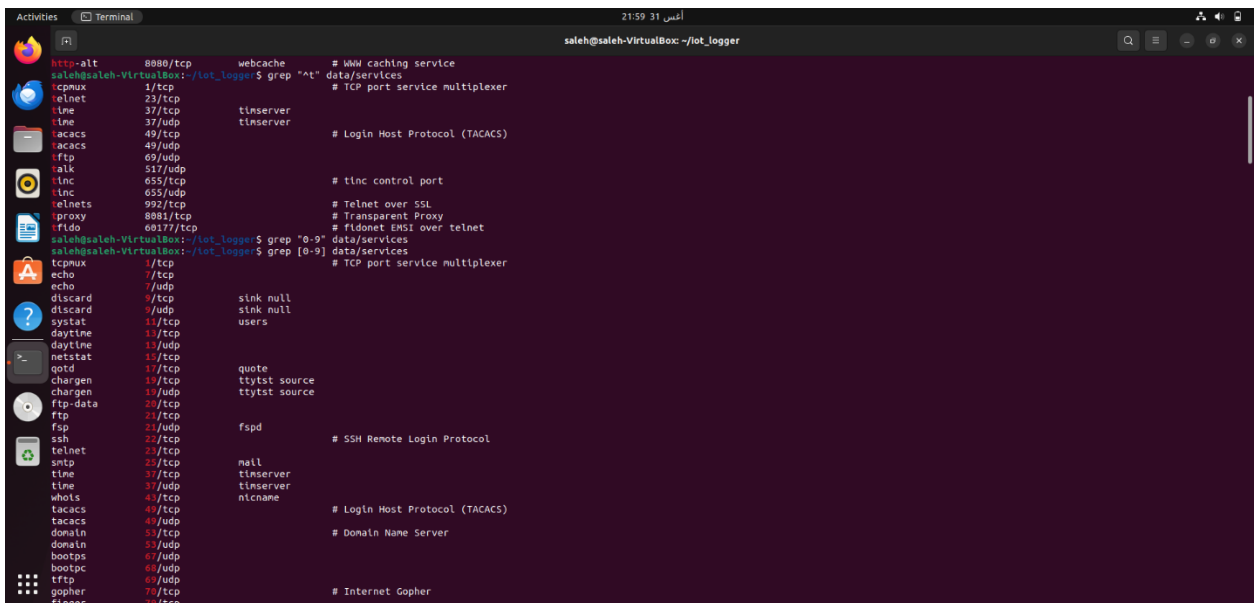
```
saleh@saleh-VirtualBox:~$ cd ~/iot_logger
saleh@saleh-VirtualBox:~/iot_logger$ touch logs/temperature.log
saleh@saleh-VirtualBox:~/iot_logger$ ls
data  logs  scripts
saleh@saleh-VirtualBox:~/iot_logger$ touch scripts/sensor_script.py
saleh@saleh-VirtualBox:~/iot_logger$
```

2.



```
saleh@saleh-VirtualBox:~/iot_logger$ cp /etc/services data/
saleh@saleh-VirtualBox:~/iot_logger$ grep "ssh" data/services
ssh                22/tcp             # SSH Remote Login Protocol
saleh@saleh-VirtualBox:~/iot_logger$ grep "http" data/services
# Updated from https://www.iana.org/assignments/service-names-port-numbers/service-names-port-numbers.xhtml
http               80/tcp             # WorldWideWeb HTTP
https              443/tcp            # https protocol over TLS/SSL
https              443/udp            # HTTP/3
http-alt           8080/tcp            # WWW caching service
saleh@saleh-VirtualBox:~/iot_logger$
```

3.



```
saleh@saleh-VirtualBox:~/iot_logger$ cat data/services
http-alt           8080/tcp            # WWW caching service
tcpmux             1/tcp              # TCP port service multiplexer
telnet             23/tcp             # Telnet over SSL
time               37/udp             # Transparent Proxy
time               37/tcp             # fido net EMI over telnet
tacacs             49/udp             # Login Host Protocol (TACACS)
tftp               69/udp             # Trivial File Transfer Protocol
talk               517/udp            # tinc control port
tinc               655/tcp            # tinc control port
telnet             992/tcp            # Telnet over SSL
tproxy             8081/tcp            # Transparent Proxy
tftpd              6017/tcp           # fido net EMI over telnet
saleh@saleh-VirtualBox:~/iot_logger$ grep "0-9" data/services
saleh@saleh-VirtualBox:~/iot_logger$ grep [0-9] data/services
tcpmux             1/tcp              # TCP port service multiplexer
echo               7/tcp              # Echo Protocol
discard            9/tcp              # Discard Protocol
discard            9/udp              # Discard Protocol
sysstat            11/tcp             # System Statistics
daytime            13/tcp             # Daytime Protocol
daytime            13/udp             # Daytime Protocol
netstat            17/tcp             # Network Statistics
qotd               17/udp             # Quote of the Day
chargen            19/tcp             # Character Generator
chargen            19/udp             # Character Generator
ftp-data           20/tcp             # File Transfer Protocol Data
ftp                21/tcp             # File Transfer Protocol
ftp                21/udp             # File Transfer Protocol
ssh                22/tcp             # SSH Remote Login Protocol
telnet             23/tcp             # Telnet over SSL
snmp               161/tcp            # Simple Network Management Protocol
time               37/udp             # Time Protocol
time               37/tcp             # Time Protocol
whois              43/tcp             # Whois Protocol
tacacs             49/udp             # Login Host Protocol (TACACS)
tacacs             49/tcp             # Login Host Protocol (TACACS)
domain            53/udp             # Domain Name Server
domain            53/tcp             # Domain Name Server
bootps            67/udp             # Bootstrap Protocol
bootpc            68/udp             # Bootstrap Protocol
tftp              69/udp             # Trivial File Transfer Protocol
gopher            70/tcp             # Internet Gopher
finger            79/tcp             # FINGER Protocol
```

4.

```
saleh@saleh-VirtualBox:~/iot_logger$ find /home/saleh -name "*.txt"
/home/saleh/gitdemo/file.txt
/home/saleh/gitdemo/test.txt
/home/saleh/snap/firefox/common/.mozilla/firefox/7co90aou.default/serviceworker.txt
/home/saleh/snap/firefox/common/.mozilla/firefox/7co90aou.default/pkcs11.txt
/home/saleh/.cache/tracker3/files/locale-for-miner-apps.txt
/home/saleh/.cache/tracker3/files/first-index.txt
/home/saleh/.cache/tracker3/files/last-crawl.txt
saleh@saleh-VirtualBox:~/iot_logger$ rm /home/saleh/temp*.txt
rm: cannot remove '/home/saleh/temp*.txt': No such file or directory
saleh@saleh-VirtualBox:~/iot_logger$ find /home/saleh -name "temp*.txt" -delete
```

5.

```
saleh@saleh-VirtualBox:~/iot_logger$ cd logs
saleh@saleh-VirtualBox:~/iot_logger/logs$ ln -s tempreatur symbolic_link
saleh@saleh-VirtualBox:~/iot_logger/logs$ ln tempreatur hard_link
ln: failed to access 'tempreatur': No such file or directory
saleh@saleh-VirtualBox:~/iot_logger/logs$ ln tempreature hard_link
ln: failed to access 'tempreature': No such file or directory
saleh@saleh-VirtualBox:~/iot_logger/logs$ ln tempreature.log hard_link
saleh@saleh-VirtualBox:~/iot_logger/logs$ ls
hard_link symbolic_link tempreature.log
saleh@saleh-VirtualBox:~/iot_logger/logs$ ln -s tempreatur.log symbolic_link
ln: failed to create symbolic link 'symbolic_link': File exists
saleh@saleh-VirtualBox:~/iot_logger/logs$ ls
hard_link symbolic_link tempreature.log
```

6.

```
saleh@saleh-VirtualBox:~/iot_logger/logs$ tree ~/iot_logger
/home/saleh/iot_logger
├── data
│   └── services
├── logs
│   ├── hard_link
│   ├── symbolic_link -> tempreatur
│   └── tempreature.log
└── scripts
    └── sensor_script.py

4 directories, 5 files
saleh@saleh-VirtualBox:~/iot_logger/logs$
```

Open-Ended Questions:

1-

Regular file (-): text, binary, scripts.

Directory (d): contains files.

Symbolic link (l): shortcut pointing to another file.

Character device (c): hardware device (e.g., /dev/tty).

Block device (b): storage devices (e.g., /dev/sda).

Socket (s): used for inter-process communication.

Pipe (p): first-in-first-out (FIFO) communication.

To check file type:

```
ls -l
```

```
file <filename>
```

2-

Hard Link: A hard link: there is in a way another label for that very file. It refers to the same inode (which is the data on disk) and practically preserves the data even if the original file is erased. However, hard links are not valid in different partitions or filesystems.

symbolic link (or symlink): is a file that serves as a pointer or shortcut to a different file by its path. If that file is removed, the symlink is left broken since there is no target to link to. For the sake of illustration, a hard link works like having backup copies that remain intact even if one name is removed. Symlinks serve as pointers in configuration, like in /etc/alternatives/, where the links are used to designate the active version of the program.

3-

- **rmdir <dir>**: Removes only empty directories.
- **rm -r <dir>**: Recursively deletes a directory and all its contents (files + subfolders).