

Day 6 – Phase 6: Log Rotation, Scheduling, Archiving

Tasks:

1,2:

```
es Terminal 14:08 4 سبت
saleh@saleh-VirtualBox: ~
saleh@saleh-VirtualBox:~$ sudo nano /etc/logrotate.d/temperature
saleh@saleh-VirtualBox:~$ sudo logrotate -f /etc/logrotate.d/temperature
saleh@saleh-VirtualBox:~$ ls -l ~/iot_logger/logs
total 28
-rw-rw-r-- 2 702 iot_team 8450 19:51 3 سبت hard_link
-rw-rw-r-- 1 saleh saleh 48 19:03 3 سبت high_temp.log
-rw-rw-r-- 1 saleh saleh 0 19:01 3 سبت newfile
lrwxrwxrwx 1 saleh saleh 43 13:41 4 سبت temperature -> /home/saleh/iot_logger/logs/temperature.log
lrwxrwxrwx 1 saleh saleh 43 13:41 4 سبت temperature.log -> /home/saleh/iot_logger/logs/temperature.log
-rw-rw-r-- 2 702 iot_team 8450 19:51 3 سبت temp_HL.log
saleh@saleh-VirtualBox:~$
```

```
es Terminal
GNU nano 6.2
/home/saleh/iot_logger/logs/temperature.log {
    size 1M
    rotate 5
    compress
    missingok
    notifempty
    create 644 saleh saleh
}
```

3,4:

```
ties Terminal 14:13 4 سبت
saleh@saleh-VirtualBox: ~
saleh@saleh-VirtualBox:~$ crontab -e
No modification made
saleh@saleh-VirtualBox:~$ crontab -e
crontab: installing new crontab
saleh@saleh-VirtualBox:~$ ls -lh ~/iot_logger/logs/temperature.log
lrwxrwxrwx 1 saleh saleh 43 13:41 4 سبت /home/saleh/iot_logger/logs/temperature.log -> /home/saleh/iot_logger/logs/temperature.log
saleh@saleh-VirtualBox:~$ tail -f ~/iot_logger/logs/temperature.log
tail: cannot open '/home/saleh/iot_logger/logs/temperature.log' for reading: Too many levels of symbolic links
tail: no files remaining
saleh@saleh-VirtualBox:~$
```

```
les Terminal 14:09 4 سبت
saleh@saleh-VirtualBox: ~
GNU nano 6.2 /tmp/crontab.xlAt0b/crontab
*/5 * * * * SENSOR_TYPE=temperature python3 /home/saleh/iot_logger/scripts/sensor_script.py >> /home/saleh/iot_logger/logs/temperature.log 2>&1# 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
```

5.

```
les Terminal 14:15 4 سبت
saleh@saleh-VirtualBox: ~
saleh@saleh-VirtualBox:~$ tar -czvf ~/iot_logger/data/logs_archive.tar.gz ~/iot_logger/logs/*.log*
tar: Removing leading '/' from member names
/home/saleh/iot_logger/logs/high_temp.log
tar: Removing leading '/' from hard link targets
/home/saleh/iot_logger/logs/temperature.log
/home/saleh/iot_logger/logs/temp_HL.log
saleh@saleh-VirtualBox:~$ ls -lh ~/iot_logger/data/logs_archive.tar.gz
-rw-rw-r-- 1 saleh saleh 1.9K 14:14 4 سبت /home/saleh/iot_logger/data/logs_archive.tar.gz
saleh@saleh-VirtualBox:~$
```

6.

```
les Terminal 14:17 4 سبت
saleh@saleh-VirtualBox: ~
saleh@saleh-VirtualBox:~$ mkdir -p ~/iot_logger/server
saleh@saleh-VirtualBox:~$ cp ~/iot_logger/data/logs_archive.tar.gz ~/iot_logger/server/
saleh@saleh-VirtualBox:~$ ls -l ~/iot_logger/data/logs_archive.tar.gz
-rw-rw-r-- 1 saleh saleh 1914 14:14 4 سبت /home/saleh/iot_logger/data/logs_archive.tar.gz
saleh@saleh-VirtualBox:~$ ls -l ~/iot_logger/server
total 4
-rw-rw-r-- 1 saleh saleh 1914 14:15 4 سبت logs_archive.tar.gz
saleh@saleh-VirtualBox:~$ cp ~/iot_logger/data/logs_archive.tar.gz ~/iot_logger/server/
saleh@saleh-VirtualBox:~$ scp ~/iot_logger/server/logs_archive.tar.gz username@remote_host:/path/to/destination
ssh: Could not resolve hostname remote_host: Temporary failure in name resolution
lost connection
saleh@saleh-VirtualBox:~$
```

Open-ended questions:

1. How does cron scheduling work? Show a crontab entry to run a script every 5 minutes?

- Cron is a scheduler in Linux for automating commands/scripts.
- Crontab has 5-time fields: minute, hour, day of month, month, day of week.

Example:

`*/5 * * * *` → every 5 minutes.

2. Why do we need log rotation? Show an example logrotate config for temperature.log?

- Prevents log files from growing endlessly.
- Saves disk space and improves reliability.
- Automates compression and deletion of old logs.

Example config (/etc/logrotate.d/temperature):

```
/home/pi/iot_logger/logs/temperature.log {  
    size 1M  
    rotate 5  
    compress  
    missingok
```

```
notifempty  
create 644 pi pi  
}
```

3. Explain the difference between a Virtual Machine and a Container. Must containers use the same OS as the host? Why or why not?

- **VM:** Emulates hardware + runs full OS, heavier, slower.
- **Container:** Shares host kernel, isolates apps, lighter, faster.
- Containers must use the **same kernel type** as host.

Example: Linux host → containers must run Linux, but can be different distros (Ubuntu, Debian, Alpine).

4. Reflection: Which actions in this project combined multiple Linux concepts? How does this apply to real IoT systems?

- Combining **redirection + process monitoring** → checking sensor logs and PIDs.
- Combining **users + permissions** → securing project files.
- Combining **cron + logrotate** → automation + reliability.

- In real IoT systems: ensures devices can run continuously, store data safely, recover from errors, and stay efficient in production.