

Day 6

```
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work
total 0
lrwx----- 1 ahmed-gwely ahmed-gwely 64 Sep  5 00:08 0 -> /dev/pts/0
l-wx----- 1 ahmed-gwely ahmed-gwely 64 Sep  5 00:08 1 -> /media/ahmed-gwely/Games/linux_work/sic_work/iot_logger/logs/temperature.log
l-wx----- 1 ahmed-gwely ahmed-gwely 64 Sep  5 00:08 2 -> /media/ahmed-gwely/Games/linux_work/sic_work/iot_logger/logs/temperature.log
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$ grep "2025" iot_logger/logs/temperature.log > iot_logger/logs/today.log
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$ cp iot_logger/logs/* iot_logger/data/
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$ unset SENSOR_TYPE
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$ (ls -l | grep .py; sleep 20) &
[2] 9484
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$ sudo nano /etc/logrotate.d/temperature
[sudo] password for ahmed-gwely:
[2]+  Done                  (ls --color=auto -l | grep --color=auto .py; sleep 20)
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$ sudo logrotate -f /etc/logrotate.d/temperature
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$ crontab -e
no crontab for ahmed-gwely - using an empty one

Select an editor. To change later, run 'select-editor'.
 1. /bin/nano          <---- easiest
 2. /usr/bin/vim.tiny
 3. /bin/ed

Choose 1-3 [1]: 1
crontab: installing new crontab
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$ ls -lh ~/iot_logger/logs/temperature.log
ls: cannot access '/home/ahmed-gwely/iot_logger/logs/temperature.log': No such file or directory
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$ ls -lh iot_logger/logs/temperature.log
-rwxrwx-- 3 developer iot_team 8.0K Sep  5 00:26 iot_logger/logs/temperature.log
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$ ls -lh iot_logger/logs/*.gz
ls: cannot access 'iot_logger/logs/*.gz': No such file or directory
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$ gzip -c iot_logger/logs/temperature.log > iot_logger/logs/temperature.log.1.gz
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$ ls -lh iot_logger/logs/*.gz
-rw-rw-r-- 1 ahmed-gwely ahmed-gwely 1.5K Sep  5 00:35 iot_logger/logs/temperature.log.1.gz

ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$ mkdir -p server
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$ cp iot_logger/data/logs_archive*.tar.gz ~/server/
cp: cannot create regular file '/home/ahmed-gwely/server/': Not a directory
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$ cp iot_logger/data/logs_archive*.tar.gz server/
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$ ls -lh server/
total 4.0K
-rw-rw-r-- 1 ahmed-gwely ahmed-gwely 1.6K Sep  5 00:39 logs_archive_2025-09-05.tar.gz
ahmed-gwely@ahmed-gwely-ASUS-TUF-Gaming-F15-FX507VV4-FX507VV4:/media/ahmed-gwely/Games/linux_work/sic_work$
```

1- How does cron scheduling work?

- `cron` is a **Linux daemon** that runs scheduled tasks automatically at specified times.
- Each user can have a **crontab**, a list of commands with timing rules.

m h dom mon dow command

Field	Meaning
m	Minute (0-59)
h	Hour (0-23)
dom	Day of month (1-31)
mon	Month (1-12)
dow	Day of week (0-7, 0 or 7 = Sunday)
command	Command to run

```
* /5 * * * * /usr/bin/python3 /home/ahmed-gwely/iot_logger/scripts/sensor_script.py >>
/home/ahmed-gwely/iot_logger/logs/temperature.log 2>&1
```

2- Why do we need log rotation?

- Logs can **grow indefinitely**, filling the disk.
- Log rotation keeps the system **stable** by compressing old logs and limiting history.

```
/home/ahmed-gwely/iot_logger/logs/temperature.log {
    size 1M
    rotate 5
    compress
    missingok
    notifempty
    copytruncate
}
```

3- Difference between Virtual Machine (VM) and Container

Feature	VM	Container
OS	Full guest OS	Shares host OS kernel
Size	Heavy	Lightweight
Startup	Slow	Fast
Isolation	Strong (hardware-level)	Process-level isolation
OS requirement	Any OS	Must be compatible with host kernel

Containers don't need the same OS as host, but must be compatible with the host kernel.

- Example: Ubuntu container can run on a Debian host, because both use Linux kernel.

4- Reflection

Actions combining multiple Linux concepts:

- Cron scheduling + redirection + background process → automated logging
- Log rotation + compression → disk management
- File permissions + ownership → security

IoT relevance:

- IoT systems run **automated sensors** 24/7
- Logs must be **stored, rotated, and secured**
- Combining Linux concepts ensures **reliability, security, and automation** in real-world IoT deployments

The End

Thanks For Reading