

Activities Terminal 21:08 4 سبت

noor@NOOR: ~

```
GNU nano 6.2 /etc/logrotate.d/temperature
/home/$USER/iot_logger/logs/temperature.log {
    size 1M
    rotate 5
    compress
    missingok
    notifempty
    create 644 noor noor
}
```

Read 8 lines

Help Write Out Where Is Cut Execute Location
Exit Read File Replace Paste Justify Go To Line

Activities Terminal 21:10 4 سبت

noor@NOOR: ~

```
noor@NOOR:~$ tail -n 3 /home/noor/iot_logger/logs/temperature.log
Wed Sep 3 22:17:01 2025 | temperature | 24
Wed Sep 3 22:17:03 2025 | temperature | 27
Wed Sep 3 22:17:05 2025 | temperature | 20
noor@NOOR:~$ sudo nano /etc/logrotate.d/temperature
noor@NOOR:~$ sudo logrotate -f /etc/logrotate.d/temperature
noor@NOOR:~$ ls -lh ~/iot_logger/logs/
total 88K
-rw-rw-r-- 1 noor noor 8.0K 21:31 3 سبت filtered.log
-rwxrwx--- 1 developer iot_team 72K 22:17 3 سبت temperature.log
-rwxrwx--- 1 noor noor 156 18:45 2 سبت temperature.log.save
noor@NOOR:~$ crontab -e
crontab: installing new crontab
noor@NOOR:~$ 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').
#
```

```
noor@NOOR: ~  
# 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 * * * * /usr/bin/python3 /home/noor/iot_logger/scripts/sensor_script.py >> /home/noor/  
/iot_logger/logs/temperature.log 2>&1  
noor@NOOR:~$
```

File Machine View Input Devices Help

```
Activities Terminal 21:14 4 سبت  
noor@NOOR: ~  
noor@NOOR:~$ tail -f /home/noor/iot_logger/logs/temperature.log  
Wed Sep 3 22:16:47 2025 | temperature | 27  
Wed Sep 3 22:16:49 2025 | temperature | 20  
Wed Sep 3 22:16:51 2025 | temperature | 22  
Wed Sep 3 22:16:53 2025 | temperature | 30  
Wed Sep 3 22:16:55 2025 | temperature | 30  
Wed Sep 3 22:16:57 2025 | temperature | 30  
Wed Sep 3 22:16:59 2025 | temperature | 29  
Wed Sep 3 22:17:01 2025 | temperature | 24  
Wed Sep 3 22:17:03 2025 | temperature | 27  
Wed Sep 3 22:17:05 2025 | temperature | 20  
noor@NOOR:~$
```

```

noor@NOOR: ~
noor@NOOR:~$ tail -f /home/noor/iot_logger/logs/temperature.log
Thu Sep  4 21:27:28 2025 | unknown | 26
Thu Sep  4 21:27:30 2025 | unknown | 20
Thu Sep  4 21:27:32 2025 | unknown | 28
Thu Sep  4 21:27:34 2025 | unknown | 25
Thu Sep  4 21:27:36 2025 | unknown | 20
Thu Sep  4 21:27:38 2025 | unknown | 24
Thu Sep  4 21:27:40 2025 | unknown | 20
Thu Sep  4 21:27:42 2025 | unknown | 21
Thu Sep  4 21:27:44 2025 | unknown | 29
Thu Sep  4 21:27:46 2025 | unknown | 29
^C
noor@NOOR:~$ tar -czf /home/noor/iot_logger/data/logs_$(date +%F).tar.gz -C /home/noor/iot_logger/logs temperature.log
noor@NOOR:~$ ls -lh /home/noor/iot_logger/data/
total 56K
-rw-rw-r-- 1 noor      noor      8.0K 21:35 3 سیت filtered.log
-rw-rw-r-- 1 noor      noor     10K 21:35 4 سیت logs_2025-09-04.tar.gz
-rwxrwx--- 1 developer iot_team 13K 23:17 31 لکش services
-rwxrwx--- 1 noor      noor     16K 21:35 3 سیت temperature.log
-rwxrwx--- 1 noor      noor    156K 21:35 3 سیت temperature.log.save
lrwxrwxrwx 1 developer iot_team  33 23:23 31 لکش temperature_soft.log -> ./iot_logger/logs/temperature.log
noor@NOOR:~$

```

```

noor@NOOR: ~
noor@NOOR:~$ tail -f /home/noor/iot_logger/logs/temperature.log
Thu Sep  4 21:27:36 2025 | unknown | 20
Thu Sep  4 21:27:38 2025 | unknown | 24
Thu Sep  4 21:27:40 2025 | unknown | 20
Thu Sep  4 21:27:42 2025 | unknown | 21
Thu Sep  4 21:27:44 2025 | unknown | 29
Thu Sep  4 21:27:46 2025 | unknown | 29
^C
noor@NOOR:~$ tar -czf /home/noor/iot_logger/data/logs_$(date +%F).tar.gz -C /home/noor/iot_logger/logs temperature.log
noor@NOOR:~$ ls -lh /home/noor/iot_logger/data/
total 56K
-rw-rw-r-- 1 noor      noor      8.0K 21:35 3 سیت filtered.log
-rw-rw-r-- 1 noor      noor     10K 21:35 4 سیت logs_2025-09-04.tar.gz
-rwxrwx--- 1 developer iot_team 13K 23:17 31 لکش services
-rwxrwx--- 1 noor      noor     16K 21:35 3 سیت temperature.log
-rwxrwx--- 1 noor      noor    156K 21:35 3 سیت temperature.log.save
lrwxrwxrwx 1 developer iot_team  33 23:23 31 لکش temperature_soft.log -> ./iot_logger/logs/temperature.log
noor@NOOR:~$ mkdir /home/noor/server
noor@NOOR:~$ cp /home/noor/iot_logger/data/logs_2025-09-04.tar.gz /home/noor/server/
noor@NOOR:~$ ls -lh /home/noor/server/
total 12K
-rw-rw-r-- 1 noor noor 10K 21:40 4 سیت logs_2025-09-04.tar.gz
noor@NOOR:~$

```

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

Cron: runs tasks automatically at a scheduled times and it's a daemon process which runs as a background process

Crontab (cron table) has 5 times fields : min hour day day of week command

*/n = every n units if we want every 5 min */5

Example crontab : */5 * * * * /home/noor/scripts/ this means every 5 minutes it will run the script from this file

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

Because logs keep growing when programs run and if they are never cleaned up the fill up the disk space

Log rotation : archive old logs and compresses them

Ex:

/home/noor/iot_logger/logs/temperature.log

{ daily

rotate 7

compress

missingok

notifempty

create 644 noor noor}

daily : rotate once per day rotate : keep 7 days of logs

compress : compress old logs

missingok : if the file is missing go to next one without issuing an error

create : create a new log with given permissions

Explain the difference between a Virtual Machine and a Container

Virtual machine : runs a full operating system with its own kernel and needs a hypervisor like virtual box ,it is heavy (takes a lot of space) but is isolated

Container : share the host operating system kernel and It runs only the app in an isolated environment also its much lighter and faster

Must containers use the same OS as the host? Why or why not?

yes the container must have the same os as the host because they share the same kernel

you can run different linux distributions at the same time as they share the same kernel

Reflection: Which actions in this project combined multiple Linux concepts (e.g., redirection + process monitoring)? How does this apply to real IoT systems

redirection > : to save the output of temperature.log

process monitoring and scheduling : with cron to keep tasks running

permissions & groups to control the access

log rotation : to manage the rowing logs and compress them

in real IOT system : devices like sensors collect data : logs

scheduled tasks : cron process

permission control : used in applications to ensure only authorized people can access specific data

log rotation : storage management