Deploy, Configure, and Maintain Systems

english and indonesia

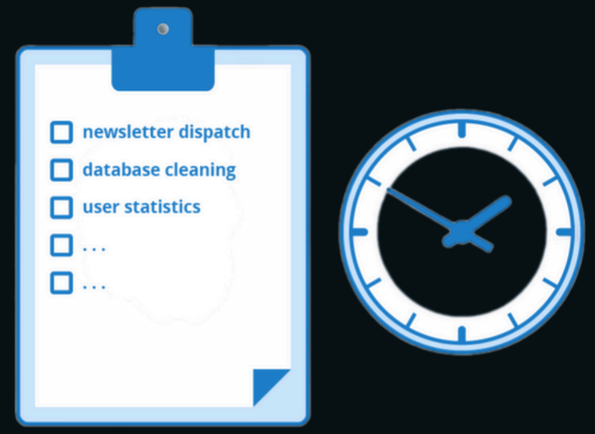
Presented by **Ruben**

What is Scheduled jobs ?

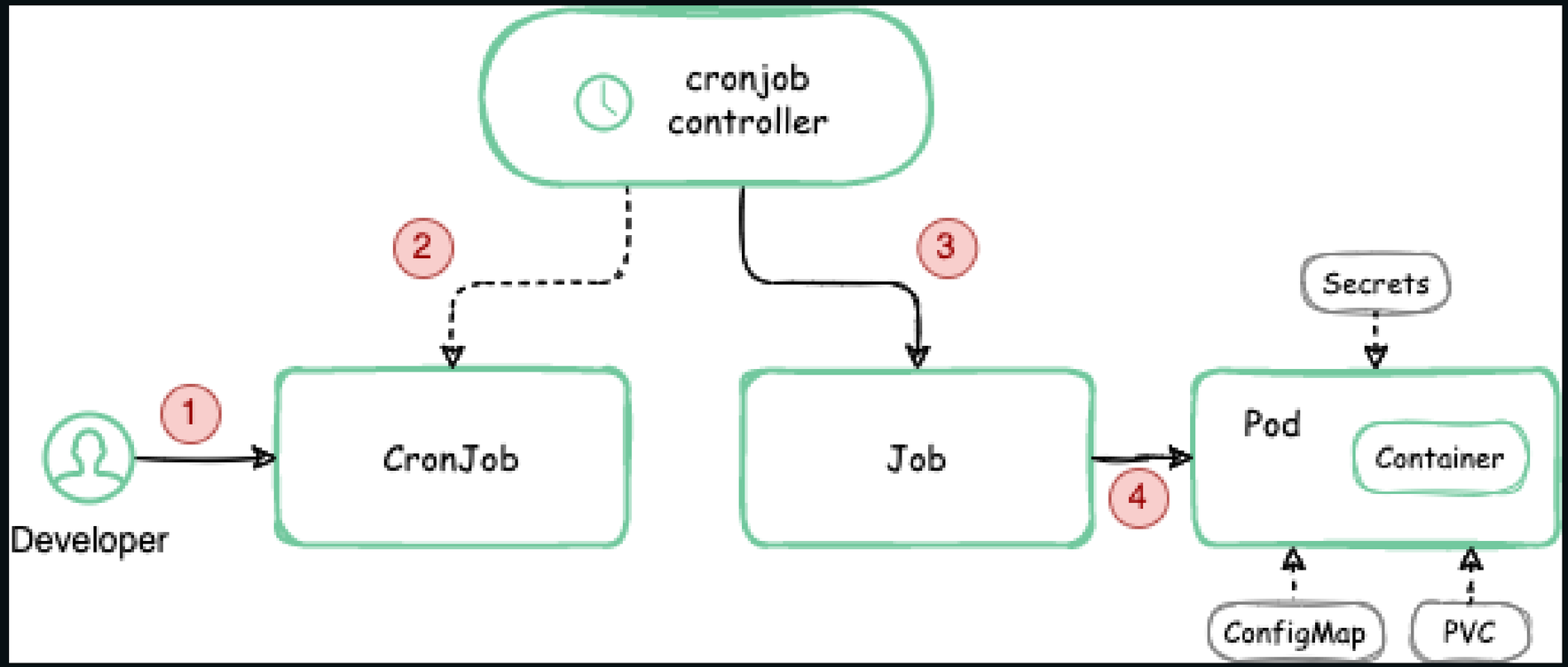
Scheduled Jobs are automated pieces of work that can be performed at a specific time or on a recurring schedule.

You can automate the following kinds of tasks:

- Automatically generate and distribute a report
- Automatically generate and schedule an entity of records, such as an incident, change item, configuration item, from a template
- Run scheduled jobs from scripts or business rules
- etc.

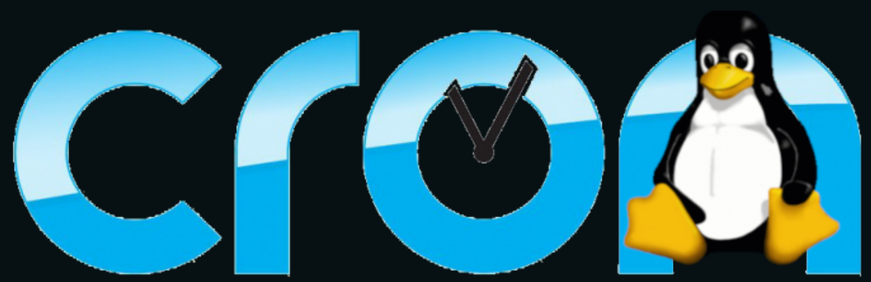


cronjob flow



Crontab

Crontab (Cron Table) adalah utilitas standar di sistem Unix dan Linux yang digunakan untuk menjadwalkan tugas-tugas yang berulang secara berkala. Crontab menggunakan file konfigurasi yang disebut "crontab" yang berisi daftar tugas (cron job) yang akan dijalankan pada waktu tertentu berdasarkan pola waktu tertentu (cron expressions)



Rules

```
#   syntax of cron
#   ┌──────────── min (0 - 59)
#   │ ┌────────── hour (0 - 23)
#   │ │ ┌──────── day (1 - 31)
#   │ │ │ ┌────── month (1 - 12)
#   │ │ │ │ ┌──── weekday (0 - 6)
#   │ │ │ │ │
#   │ │ │ │ │
#   │ │ │ │ │
#   * * * * *   user-name   command to execute
#   0 0 * * 6   root        /scripts/have_fun
```

@daily @hourly @weekly @monthly @yearly @reboot @annually

Field	Possible values
Minute	0-59
Hour	0-23
Day of month	1-31
Month	1-12
Day of week	0-6. 0 depicts Sunday. In some systems, a value of 7 represents Sunday instead
Command	Command to execute

more...

* (asterisk)	Select all possible values in a field	Place * in the hour field to run the task every hour
, (comma)	A comma is used to separate multiple values	0,3,5 in the day of week field will make the task run on Sunday and Wednesday
– (hyphen)	Used to set a range of values	10-15 in the day of month field will run the task from the 10th to the 15th day of the month
/ (separator)	A separator is used to divide values	*/10 in the hour field will make the task run every 10 hours

~$ cat /etc/crontab

```
sysadmin@workstation:~$ cat /etc/crontab
# /etc/crontab: system-wide crontab
# Unlike any other crontab you don't have to run the `crontab'
# command to install the new version when you edit this file
# and files in /etc/cron.d. These files also have username fields,
# that none of the other crontabs do.

SHELL=/bin/sh
PATH=/usr/local/sbin:/usr/local/bin:/sbin:/bin:/usr/sbin:/usr/bin

# Example of job definition:
# .---------------- minute (0 - 59)
# |  .------------- hour (0 - 23)
# |  |  .---------- day of month (1 - 31)
# |  |  |  .------- month (1 - 12) OR jan,feb,mar,apr ...
# |  |  |  |  .---- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,fri,sat
# |  |  |  |  |
# *  *  *  *  * user-name command to be executed
17 *    * * *   root    cd / && run-parts --report /etc/cron.hourly
25 6    * * *   root    test -x /usr/sbin/anacron || { cd / && run-parts --report /etc/cron.daily; }
47 6    * * 7   root    test -x /usr/sbin/anacron || { cd / && run-parts --report /etc/cron.weekly; }
52 6    1 * *   root    test -x /usr/sbin/anacron || { cd / && run-parts --report /etc/cron.monthly; }
```

for more information

```
┌──(faaiz㉿kali)-[~]
└─$ crontab --help
crontab: invalid option -- '-'
crontab: usage error: unrecognized option
usage:  crontab [-u user] [-n] file
        crontab [ -u user ] [ -i ] { -e | -l | -r }

        -h      (displays this help message)

        file    (default operation is replace, per 1003.2)
        -n      (dry run: checks the syntax, then bails out)
        -u user (choose the user whose crontab is touched)

        -e      (edit user's crontab)
        -l      (list user's crontab)
        -r      (delete user's crontab)

        -i      (prompt before deleting user's crontab)
```

-n misalkan punya schedule file dengan menggunakan $crontab -n file akan di periksa apakah success or fail.

For user schedule only

-i akan ada konfirmasi jika ingin menghapus schedule dengan menggunakan $crontab -r -i

how to use

```
# 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
```

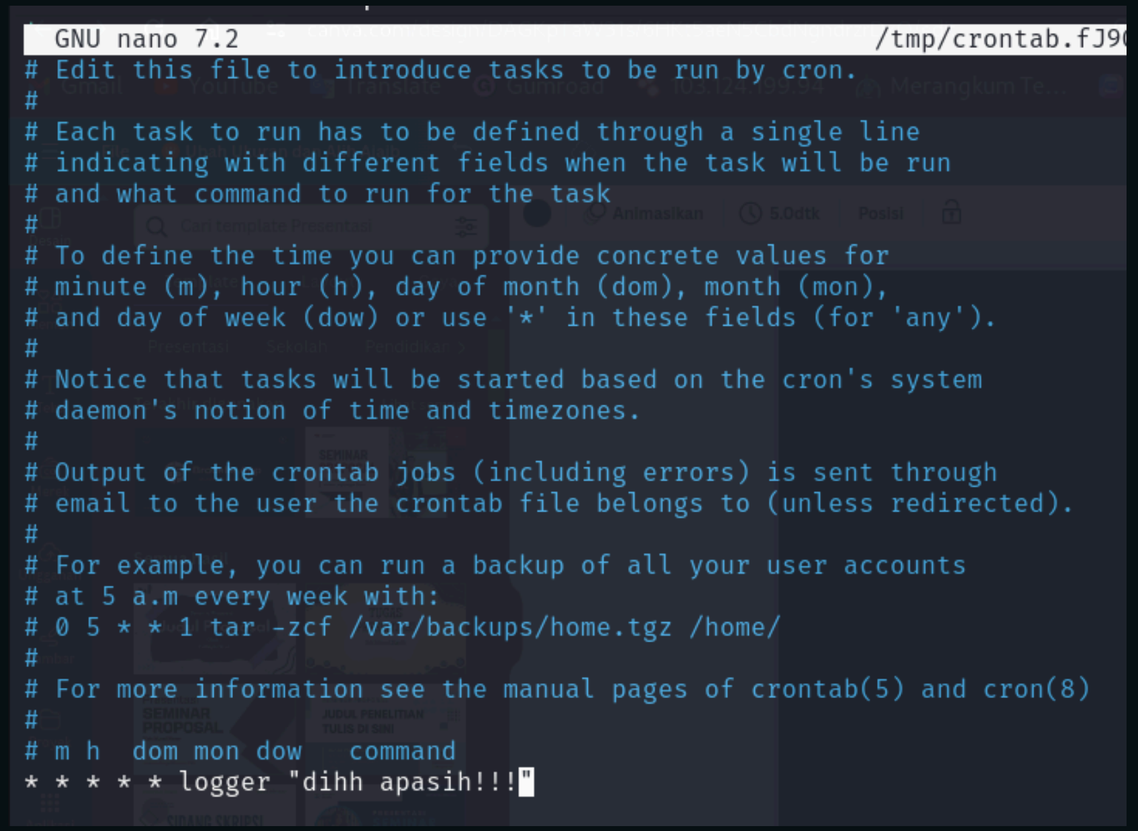
untuk mengedit crontab nya bisa menggunakan crontab -e pada user itu juga.

```
$ crontab -e
no crontab for nani - using an empty one

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

Choose 1-3 [1]: 1
```

ex:



kita bisa menghapus teks yang ditandai dengan #, setelah menambahkan task nya bisa save lalu exit.

Bagaimana melihat task user?

```
└─$ sudo 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').
#
# 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
* * * * * logger "dihh apasih!!!"
```

ini adalah hasil task yang kita buat dengan menggunakan command crontab -l

Status

```
┌──(faaiz㉿kali)-[~]
└─$ systemctl status cron
● cron.service - Regular background program processing daemon
     Loaded: loaded (/lib/systemd/system/cron.service; enabled; preset: enabled)
     Active: active (running) since Mon 2024-07-22 23:50:24 WIB; 1h 13min ago
       Docs: man:cron(8)
   Main PID: 65038 (cron)
      Tasks: 1 (limit: 9292)
     Memory: 520.0K
        CPU: 2.250s
     CGroup: /system.slice/cron.service
             └─65038 /usr/sbin/cron -f

Jul 23 01:01:01 kali CRON[85258]: pam_unix(cron:session): session opened for user testP(uid=1006) by (uid=0)
Jul 23 01:01:01 kali CRON[85259]: (testP) CMD (logger "dihh apasih!!!")
Jul 23 01:01:01 kali testP[85260]: dihh apasih!!!
Jul 23 01:01:01 kali CRON[85258]: pam_unix(cron:session): session closed for user testP
Jul 23 01:02:01 kali CRON[85519]: pam_unix(cron:session): session opened for user testP(uid=1006) by (uid=0)
Jul 23 01:02:01 kali CRON[85520]: (testP) CMD (logger "dihh apasih!!!")
Jul 23 01:02:01 kali CRON[85519]: pam_unix(cron:session): session closed for user testP
Jul 23 01:03:01 kali CRON[85773]: pam_unix(cron:session): session opened for user testP(uid=1006) by (uid=0)
Jul 23 01:03:01 kali CRON[85774]: (testP) CMD (logger "dihh apasih!!!")
Jul 23 01:03:01 kali CRON[85773]: pam_unix(cron:session): session closed for user testP
```

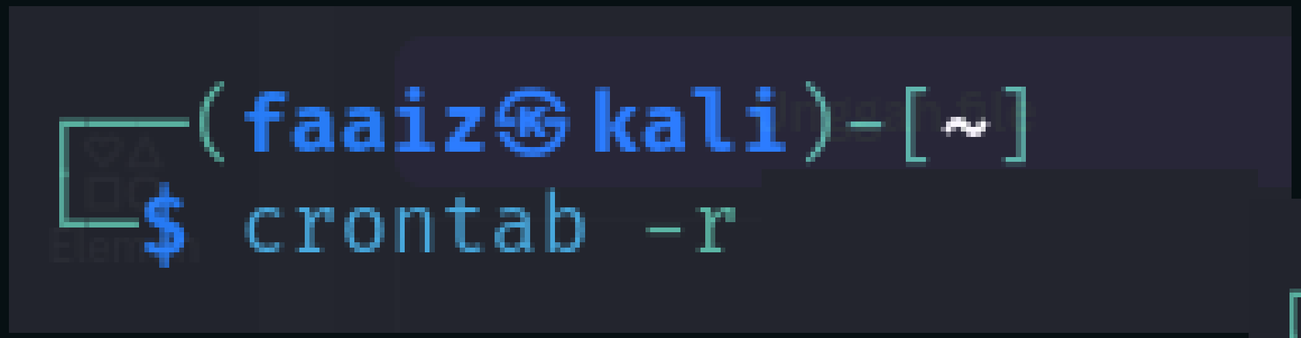
Bagaimana jika ingin edit user lain?

1. kita bisa menggunakan command crontab -e -u <user>
   ingat jika sedang berada di non-root gunakan sudo
2. bisa juga masuk ke user nya langsung dan lakukan
   perintah seperti sebelumnya.

bisa juga crontab -eu <user>

Bagaimana menghapus task nya?

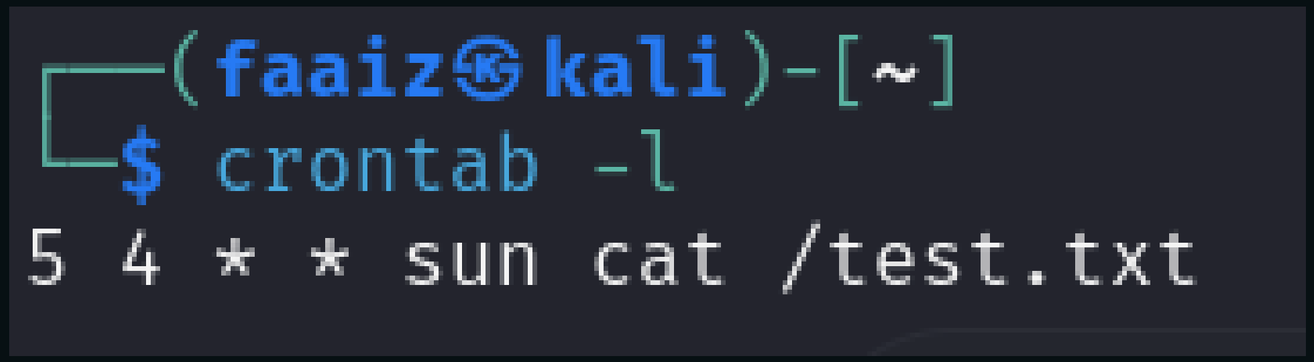
yahhhh, pakai option -r aja simple.....



ingat option -u (untuk user bisa digunakan)

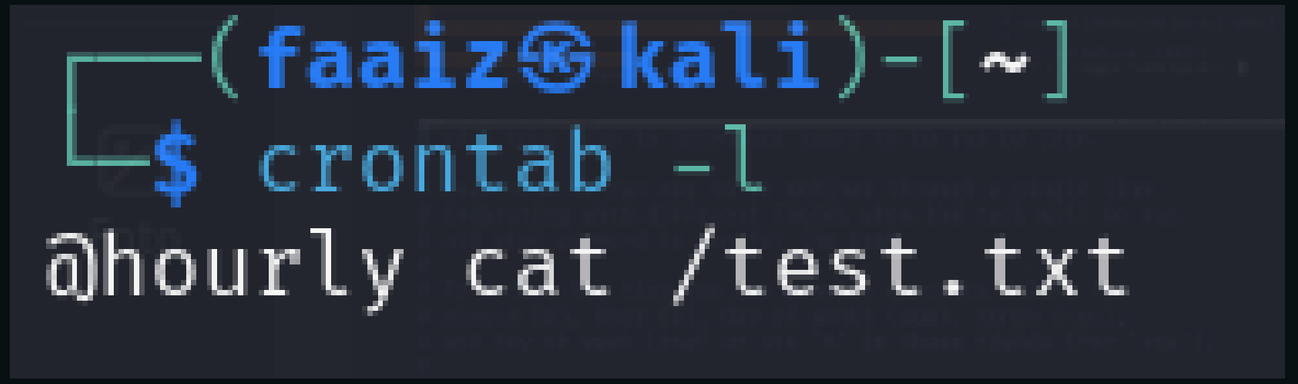
contoh

Misalnya, tugas cron berikut akan mengeksekusi script .sh kita pada waktu yang ditentukan, yaitu pada setiap hari minggu jam 4:05.



contoh

Misalnya, tugas cron berikut akan mengeksekusi script .sh kita pada waktu yang ditentukan, yaitu tiap jam.



Test

NTP (Network Time Protocol)

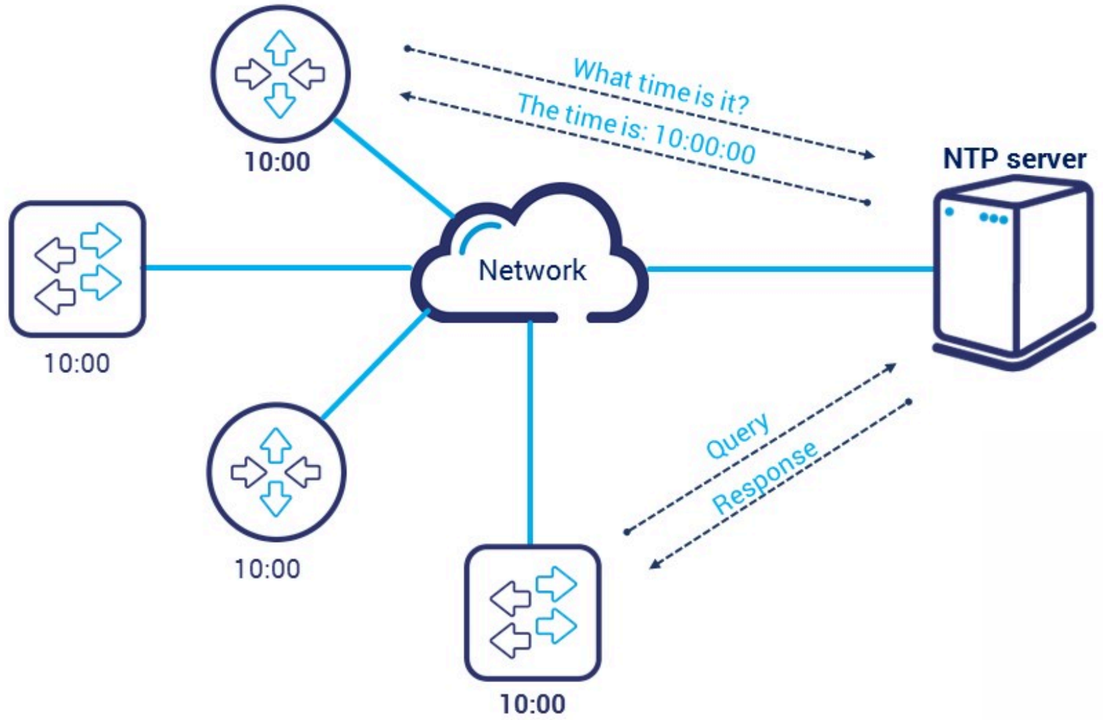
english and indonesia

Presented by **Ruben**

Objectives

Maintain accurate time synchronization with Network Time Protocol (NTP) and configure the time zone to ensure correct time stamps for events recorded by the system journal and logs.

Network time protocol - NTP



NTP server is a **reference clock**

Administer Local Clocks and Time Zones

Sinkronisasi waktu sistem sangat penting untuk analisis file log di beberapa sistem. Selain itu, beberapa layanan mungkin memerlukan sinkronisasi waktu agar berfungsi dengan benar. Mesin menggunakan Network Time Protocol untuk menyediakan dan memperoleh informasi waktu yang benar melalui internet. Sebuah mesin mungkin mendapatkan informasi waktu yang akurat dari layanan NTP publik, seperti NTP Pool Project. Pilihan lain adalah menyinkronkan dengan jam perangkat keras berkualitas tinggi untuk menyajikan waktu yang akurat kepada klien lokal. Perintah timedatectl menunjukkan gambaran umum pengaturan sistem terkait waktu saat ini, termasuk pengaturan sinkronisasi waktu, zona waktu, dan NTP sistem saat ini.

Administer Local Clocks and Time Zones

$ timedatectl

```
sysadmin@workstation:~$ timedatectl
               Local time: Tue 2024-07-23 16:03:41 WIB
           Universal time: Tue 2024-07-23 09:03:41 UTC
                 RTC time: Tue 2024-07-23 16:03:40
                Time zone: Asia/Jakarta (WIB, +0700)
System clock synchronized: no
              NTP service: inactive
          RTC in local TZ: no
sysadmin@workstation:~$
```

list time zone

$ timedatectl list-timezones

```
sysadmin@workstation:~$ timedatectl list-timezones
Africa/Abidjan
Africa/Accra
Africa/Addis_Ababa
Africa/Algiers
Africa/Asmara
Africa/Asmera
Africa/Bamako
Africa/Bangui
Africa/Banjul
Africa/Bissau
Africa/Blantyre
Africa/Brazzaville
Africa/Bujumbura
Africa/Cairo
```

more.....

melihat informasi terkait dengan zona waktu

```
sysadmin@workstation:~$ tzselect
Please identify a location so that time zone rules can be set correctly.
Please select a continent, ocean, "coord", or "TZ".
 1) Africa
 2) Americas
 3) Antarctica
 4) Asia
 5) Atlantic Ocean
 6) Australia
 7) Europe
 8) Indian Ocean
 9) Pacific Ocean
10) coord - I want
11) TZ - I want to
#?
```

```
#? 19
Please select one of the following timezones.
1) Java, Sumatra
2) Borneo (west, central)
3) Borneo (east, south), Sulawesi/Celebes, Bali, Nusa Tengarra, Timor (west)
4) New Guinea (West Papua / Irian Jaya), Malukus/Moluccas
#? 1

The following information has been given:

        Indonesia
        Java, Sumatra

Therefore TZ='Asia/Jakarta' will be used.
Selected time is now:   Tue Jul 23 16:08:26 WIB 2024.
Universal Time is now:  Tue Jul 23 09:08:26 UTC 2024.
Is the above information OK?
1) Yes
2) No
#?
```

$ tzselect

```
#? 4
Please select a country whose clocks agree with yours.
 1) Afghanistan              29) Kyrgyzstan
 2) Antarctica               30) Laos
 3) Armenia                  31) Lebanon
 4) Azerbaijan               32) Macau
 5) Bahrain                  33) Malaysia
 6) Bangladesh               34) Mongolia
 7) Bhutan                   35) Myanmar (Burma)
 8) Brunei                   36) Nepal
 9) Cambodia                 37) Oman
10) China                    38) Pakistan
11) Christmas Island         39) Palestine
12) Cocos (Keeling) Islands  40) Philippines
13) Cyprus                   41) Qatar
14) East Timor               42) Réunion
15) French S. Terr.          43) Russia
16) Georgia                  44) Saudi Arabia
17) Hong Kong                45) Seychelles
18) India                    46) Singapore
19) Indonesia                47) Sri Lanka
```

mengubah time zone

```
sysadmin@workstation:~$ timedatectl set-timezone Asia/Bangkok
sysadmin@workstation:~$ timedatectl
               Local time: Tue 2024-07-23 16:13:09 +07
           Universal time: Tue 2024-07-23 09:13:09 UTC
                 RTC time: Tue 2024-07-23 16:13:08
                Time zone: Asia/Bangkok (+07, +0700)
System clock synchronized: no
              NTP service: inactive
          RTC in local TZ: no
sysadmin@workstation:~$
```

mengubah waktu UTC(Universal Time Coordinated) dengan manual

```
sysadmin@workstation:~$ timedatectl set-time 10:00:00
Failed to set time: Automatic time synchronization is enabled
sysadmin@workstation:~$ timedatectl
               Local time: Tue 2024-07-23 17:23:52 +07
           Universal time: Tue 2024-07-23 10:23:52 UTC
                 RTC time: Tue 2024-07-23 10:23:51
                Time zone: Asia/Bangkok (+07, +0700)
System clock synchronized: yes
              NTP service: active
          RTC in local TZ: no
sysadmin@workstation:~$ S
```

→ NTP sinkronisasi nya hidup

mengubah waktu UTC(Universal Time Coordinated) dengan manual

```
sysadmin@workstation:~$ timedatectl set-ntp false
sysadmin@workstation:~$ timedatectl set-time 10:00:00
sysadmin@workstation:~$ timedatectl
               Local time: Tue 2024-07-23 10:00:04 +07
           Universal time: Tue 2024-07-23 03:00:04 UTC
                 RTC time: Tue 2024-07-23 03:00:04
                Time zone: Asia/Bangkok (+07, +0700)
System clock synchronized: no
              NTP service: inactive
          RTC in local TZ: no
sysadmin@workstation:~$
```

NTP sinkronisasi nya mati

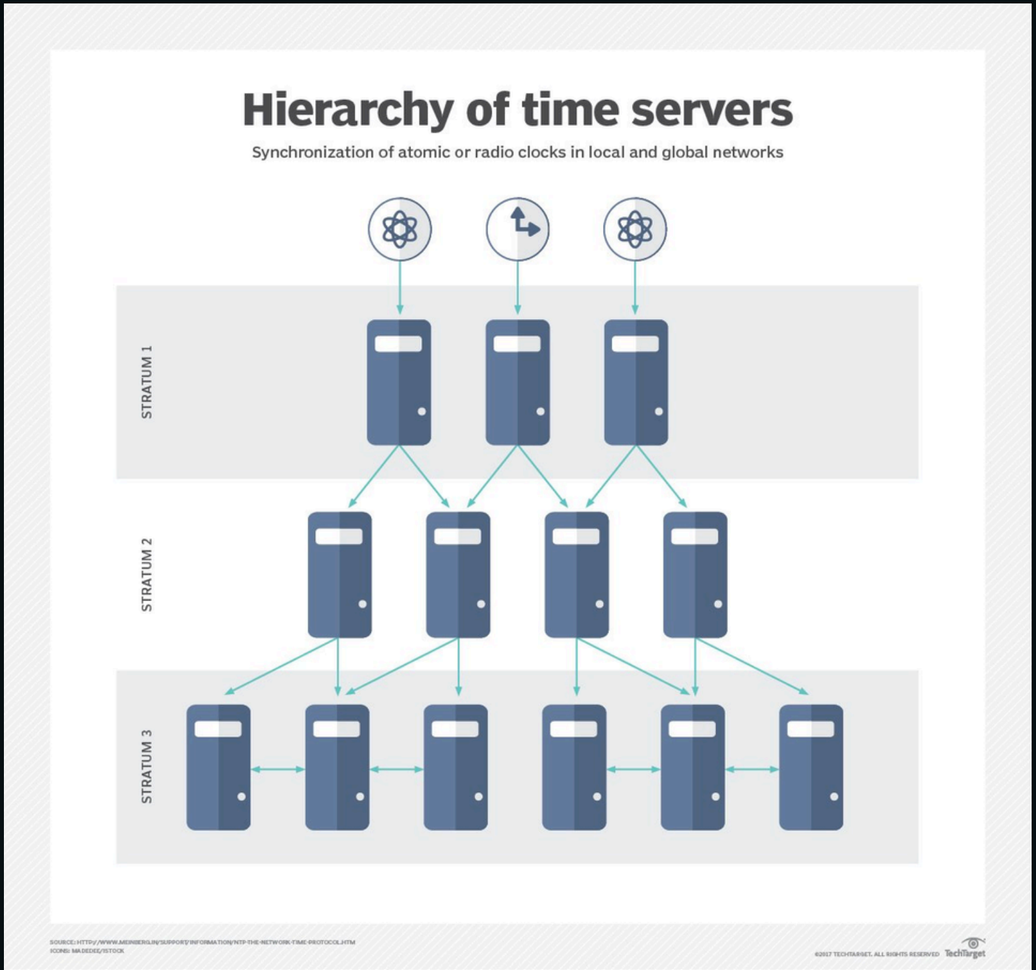
Configure and Monitor the chronyd Service

Secara default, layanan chronyd menggunakan server dari NTP Pool Project untuk menyinkronkan waktu dan tidak memerlukan konfigurasi tambahan. Anda mungkin perlu mengubah server NTP untuk mesin yang berjalan pada jaringan yang terisolasi.

contoh kegunaan NTP

- Prosedur terdistribusi bergantung pada waktu yang terkoordinasi untuk memastikan urutan yang tepat diikuti.
- Mekanisme keamanan bergantung pada pencatatan waktu yang konsisten di seluruh jaringan.
- Pembaruan sistem berkas yang dilakukan di beberapa komputer bergantung pada waktu jam yang disinkronkan.
- Sistem akselerasi jaringan dan manajemen jaringan bergantung pada keakuratan stempel waktu untuk mengukur kinerja dan memecahkan masalah.

skema hirarki waktu server ntp



Stratum NTP adalah strategi hierarkis yang digunakan untuk memastikan ketepatan waktu di antara semua perangkat dan server. Setiap level dalam hierarki tersebut mewakili jaraknya dari server NTP.

NTP memungkinkan sistem waktu yang terdistribusi dan dapat dikelola dengan lebih efisien. Stratum 0 (jam atomik atau GPS) biasanya terbatas dalam jumlah dan lokasi. Dengan stratum, sumber waktu ini bisa digunakan oleh beberapa server stratum 1, yang kemudian dapat melayani lebih banyak server stratum 2, dan seterusnya. Ini mengurangi beban langsung pada sumber waktu utama dan memungkinkan skala yang lebih besar dalam jaringan NTP.

jangan diambil pusing, santai aja cuman informasi nihh

how to create ntp?

$ apt install ntpsec / ntp

$ vi /etc/ntpsec/ntp.conf

$ systemctl restart ntpsec / ntp

 # verify status
$ ntpq -p

$ apt install chrony

$ vi /etc/chrony/chrony.conf

$ systemctl restart chrony

 # verify status

$ chronyc sources

this..

how to configure

```
  GNU nano 7.2                                  /etc/chrony/chrony.conf
# Welcome to the chrony configuration file. See chrony.conf(5) for more
# information about usable directives.

# Include configuration files found in /etc/chrony/conf.d.
confdir /etc/chrony/conf.d

# Use Debian vendor zone.
pool 2.debian.pool.ntp.org iburst

server 0.id.pool.ntp.org prefer iburst
server 1.id.pool.ntp.org iburst


# Use time sources from DHCP.
sourcedir /run/chrony-dhcp

# Use NTP sources found in /etc/ch
sourcedir /etc/chrony/sources.d

# This directive specify the locat
```

pakai yang ini aja

prefer hanya diterapkan pada 0.id.pool.ntp.org, yang menunjukkan bahwa klien NTP akan lebih memilih server ini sebagai server utama untuk sinkronisasi waktu, meskipun kedua server akan tetap digunakan untuk ketersediaan dan redundansi.

iburst adalah opsi yang dapat diterapkan pada server NTP untuk mempercepat proses sinkronisasi awal. Ketika opsi ini digunakan, klien NTP akan mengirimkan beberapa paket sinkronisasi secara berurutan pada saat pertama kali mencoba untuk menyinkronkan waktu dengan server NTP tersebut.

status

```
root@workstation:~# systemctl restart chrony
root@workstation:~# systemctl status chrony
● chrony.service - chrony, an NTP client/server
     Loaded: loaded (/lib/systemd/system/chrony.service; enabled; preset: enabled)
     Active: active (running) since Tue 2024-07-23 17:57:29 +07; 5s ago
       Docs: man:chronyd(8)
             man:chronyc(1)
             man:chrony.conf(5)
    Process: 5803 ExecStart=/usr/sbin/chronyd $DAEMON_OPTS (code=exited, status=0/SUCCESS)
   Main PID: 5805 (chronyd)
      Tasks: 2 (limit: 2282)
     Memory: 1.3M
        CPU: 105ms
     CGroup: /system.slice/chrony.service
             ├─5805 /usr/sbin/chronyd -F 1
             └─5806 /usr/sbin/chronyd -F 1

Jul 23 17:57:29 workstation systemd[1]: Starting chrony.ser
Jul 23 17:57:29 workstation chronyd[5805]: chronyd version
Jul 23 17:57:29 workstation chronyd[5805]: Frequency 1.788
Jul 23 17:57:29 workstation chronyd[5805]: Using right/UTC
Jul 23 17:57:29 workstation chronyd[5805]: Loaded seccomp f
Jul 23 17:57:29 workstation systemd[1]: Started chrony.serv
Jul 23 17:57:32 workstation chronyd[5805]: Received KoD RAT
```

$ systemctl restart chrony

$ systemctl status chrony
or
$ chronyc sources

```
sysadmin@workstation:~$ chronyc sources
MS Name/IP address         Stratum Poll Reach LastRx Last sample
===============================================================================
^? 103.17.182.30                 0   6     0     -     +0ns[   +0ns] +/-     0
^- 137.152.196.103.in-addr.>     3   6    37     6   +174us[ +174us] +/-    15
^- 12.32.162.202.in-addr.ar>     2   6    37     5  -1044us[-1044us] +/-   144
^- 230.8.177.103.in-addr.ar>     3   6    37     5   +515us[ +515us] +/-    98
^* 202.114.65.202.in-addr.a>     2   6    37     6    -13us[ -371us] +/-    40
^- 58.190.125.185.in-addr.a>     2   6    37     4  -1655us[-1655us] +/-    82
sysadmin@workstation:~$
```

System Log

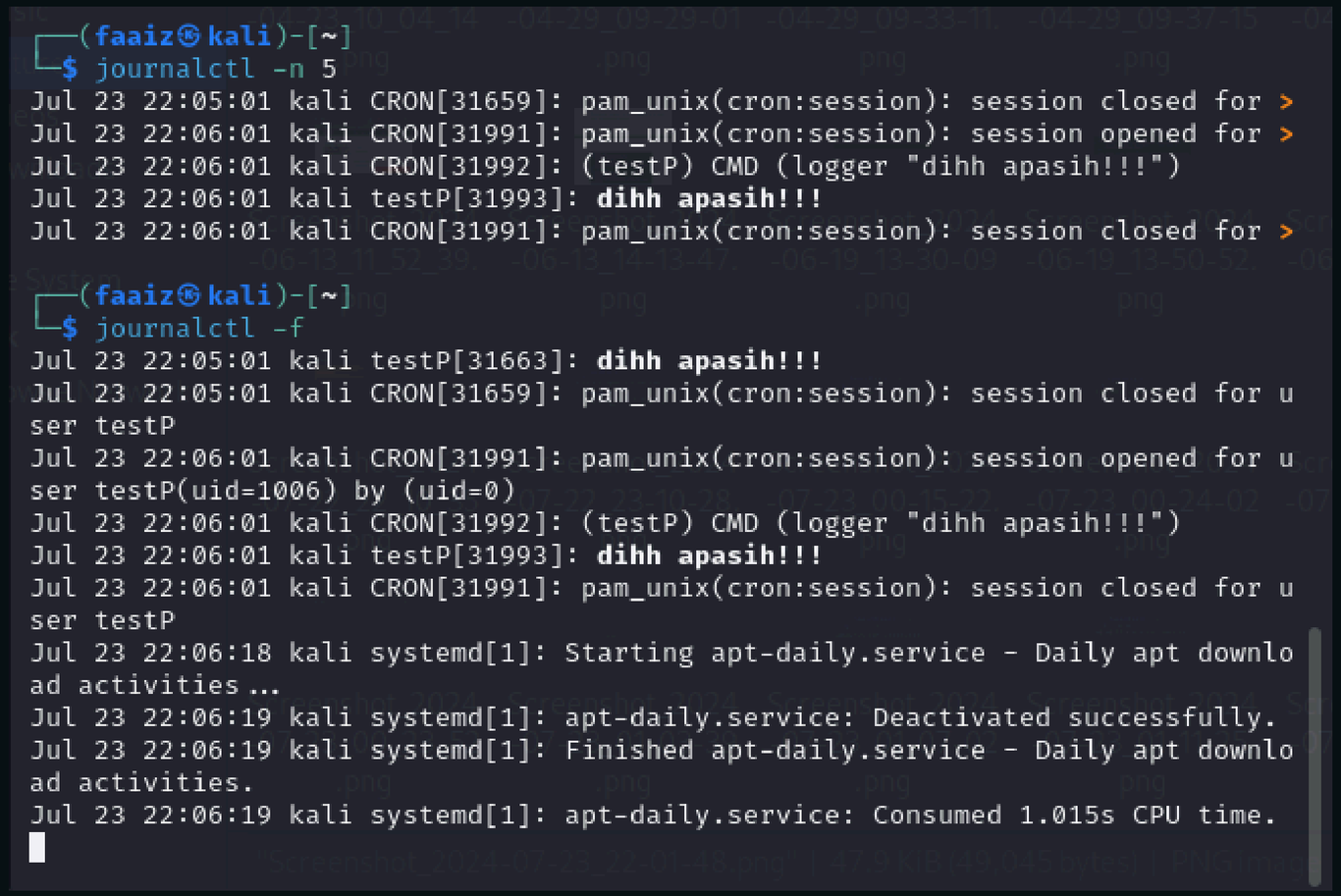
singkat aja

$ journalctl

```
┌──(faaiz㉿kali)-[~]
└─$ journalctl

Mar 28 00:43:11 kali systemd-xdg-autostart-generator[1369]: Exec binary 'star>
Mar 28 00:43:11 kali systemd-xdg-autostart-generator[1369]: /etc/xdg/autostar>
Mar 28 00:43:12 kali systemd[1354]: Queued start job for default target defau>
Mar 28 00:43:12 kali systemd[1354]: Created slice app.slice - User Applicatio>
Mar 28 00:43:12 kali systemd[1354]: Created slice session.slice - User Core S>
Mar 28 00:43:12 kali systemd[1354]: Reached target paths.target - Paths.
Mar 28 00:43:12 kali systemd[1354]: Reached target timers.target - Timers.
Mar 28 00:43:12 kali systemd[1354]: Starting dbus.socket - D-Bus User Message>
Mar 28 00:43:12 kali systemd[1354]: Listening on dirmngr.socket - GnuPG netwo>
Mar 28 00:43:12 kali systemd[1354]: Listening on gcr-ssh-agent.socket - GCR s>
```

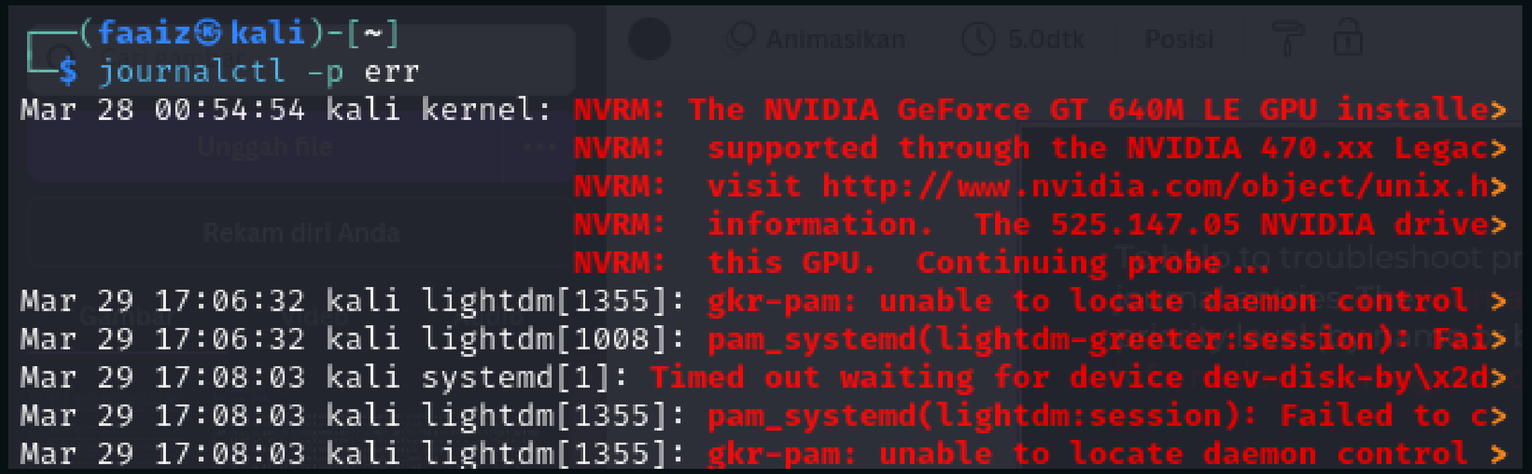
The systemd-journald service stores logging data in a structured, indexed binary file called a journal. This data includes extra information about the log event.



journalctl -n <number> akan menghasilkan output terakhir dari log sebanyak jumlah number

journalctl -f sama kayak tail -f akan menampilkan update log secara langsung di terminal

To help to troubleshoot problems, you can filter the output of the journal by the priority of the journal entries. The journalctl command -p option shows the journal entries with a specified priority level (by name or by number) or higher. The journalctl command processes the debug, info, notice, warning, err, crit, alert, and emerg priority levels, in ascending priority order.



$ man journalctl

banyak hal yang bisa dibuat.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WIKIPEDIA, CTRL+A, CTRL+C,
CTRL+V, DAN GOOGLE TRANSLATE