Referensi Cepat systemd

Manajemen layanan, unit, timer, dan journalctl

Manajemen Layanan

Perintah Layanan Dasar

```
systemctl start nginx
systemctl stop nginx
systemctl restart nginx
systemctl reload nginx    # reload config
systemctl status nginx
```

Enable / Disable

```
systemctl enable nginx    # start at boot
systemctl disable nginx   # remove from boot
systemctl enable --now nginx  # enable + start
systemctl is-enabled nginx
```

Status Layanan

active (running)	Layanan berjalan normal
active (exited)	Berjalan sekali dan selesai dengan sukses
inactive (dead)	Layanan dihentikan
failed	Layanan crash atau keluar dengan error
activating	Layanan sedang dijalankan

File Unit

Lokasi File Unit

/etc/systemd/system/	Unit buatan admin (prioritas tertinggi)
/run/systemd/system/	Unit yang dibuat saat runtime
/usr/lib/systemd/system/	Unit yang diinstal paket
~/.config/systemd/user/	Unit tingkat pengguna

Unit Layanan Dasar

```
[Unit]
Description=My Application
After=network.target
[Service]
ExecStart=/usr/bin/myapp --config /etc/myapp.conf
Restart=on-failure
User=appuser
[Install]
WantedBy=multi-user.target
```

Terapkan Perubahan

```
systemctl daemon-reload   # reload unit files
systemctl restart myapp   # apply changes
```

Timer

Unit Timer

```
[Unit]
Description=Run backup daily
[Timer]
OnCalendar=*-*-* 02:00:00
Persistent=true
[Install]
WantedBy=timers.target
```

Sintaks OnCalendar

***-*-* 02:00:00**	Setiap hari pukul 02:00
Mon *-*-* 09:00:00	Setiap Senin pukul 09:00
***-*-01 00:00:00**	Hari pertama setiap bulan
hourly / daily / weekly	Jadwal singkat

Manajemen Timer

```
systemctl list-timers --all
systemctl start backup.timer
systemctl enable backup.timer
systemd-analyze calendar "daily"
```

Target

Target Umum

multi-user.target	Boot normal, multi-pengguna, tanpa GUI
graphical.target	Desktop GUI lengkap
rescue.target	Mode rescue single-user
emergency.target	Shell minimal, hanya root
network-online.target	Jaringan sudah terkonfigurasi penuh
timers.target	Semua unit timer siap

Perintah Target

```
systemctl get-default
systemctl set-default multi-user.target
systemctl isolate rescue.target
systemctl list-dependencies graphical.target
```

Journalctl

Melihat Log

```
journalctl -u nginx        # logs for unit
journalctl -u nginx -f     # follow (tail)
journalctl -u nginx --no-pager
journalctl -b              # current boot only
```

Filter Log

```
journalctl --since "2026-03-01"
journalctl --since "1 hour ago"
journalctl -p err          # errors and above
journalctl _PID=1234
```

Level Prioritas

emerg (0)	Sistem tidak dapat digunakan
alert (1)	Tindakan segera diperlukan
crit (2)	Kondisi kritis
err (3)	Kondisi error
warning (4)	Kondisi peringatan
info (6)	Informasional
debug (7)	Pesan level debug

Pemeliharaan Log

```
journalctl --disk-usage
journalctl --vacuum-size=500M
journalctl --vacuum-time=30d
```

Jaringan

networkctl

```
networkctl list
networkctl status eth0
networkctl up eth0
networkctl down eth0
```

systemd-resolve

```
resolvectl status
resolvectl query example.com
resolvectl flush-caches
resolvectl statistics
```

Tunggu Jaringan

```
# In unit file [Unit] section:
After=network-online.target
Wants=network-online.target
```

Mount

Unit Mount

```
[Unit]
Description=Mount data volume
[Mount]
What=/dev/sdb1
Where=/mnt/data
Type=ext4
Options=defaults,noatime
[Install]
WantedBy=multi-user.target
```

Unit Automount

```
[Unit]
Description=Automount data on access
[Automount]
Where=/mnt/data
TimeoutIdleSec=300
[Install]
WantedBy=multi-user.target
```

Konvensi Penamaan

/mnt/data	File unit: **mnt-data.mount**
/var/lib/app	File unit: **var-lib-app.mount**

Path mount dengan `/` diganti `-`, tanda hubung awal dihilangkan

Environment

Mengatur Variabel Environment

```
[Service]
Environment=APP_ENV=production
Environment=PORT=8080
EnvironmentFile=/etc/myapp/env
```

Format File Environment

```
# /etc/myapp/env
APP_ENV=production
DATABASE_URL=postgres://localhost/db
SECRET_KEY=changeme
```

Hardening Layanan

ProtectSystem=strict	Filesystem hanya-baca kecuali path yang diizinkan
ProtectHome=true	Sembunyikan /home, /root, /run/user
NoNewPrivileges=true	Cegah eskalasi hak istimewa
PrivateTmp=true	/tmp terisolasi untuk layanan
ReadWritePaths=/var/lib/myapp	Izinkan penulisan ke path tertentu

Dependensi

Direktif Urutan dan Ketergantungan

After=b.service	Mulai setelah b (hanya urutan)
Before=b.service	Mulai sebelum b (hanya urutan)
Requires=b.service	Dependensi keras; gagal jika b gagal
Wants=b.service	Dependensi lunak; tidak gagal jika b gagal
BindsTo=b.service	Berhenti ketika b berhenti
Conflicts=b.service	Tidak bisa berjalan bersamaan dengan b

Inspeksi Dependensi

```
systemctl list-dependencies nginx
systemctl list-dependencies --reverse nginx
systemd-analyze dot nginx.service | dot -Tsvg > deps.svg
```

Referensi Cepat systemd

Pola Umum

Kebijakan Restart

`Restart=no`	Tidak pernah restart (default)
`Restart=on-failure`	Restart jika keluar dengan kode non-nol
`Restart=always`	Selalu restart (untuk daemon)
`RestartSec=5`	Tunggu 5 detik sebelum restart
`StartLimitBurst=3`	Maksimum restart dalam interval
`StartLimitIntervalSec=60`	Interval untuk penghitungan burst

Override Tanpa Mengedit

```
systemctl edit nginx  # creates drop-in
# /etc/systemd/system/nginx.service.d/override.conf
systemctl cat nginx   # show effective config
systemctl revert nginx  # remove overrides
```

Analisis Sistem

```
systemd-analyze                 # boot time
systemd-analyze blame           # per-unit time
systemd-analyze critical-chain
systemctl list-units --failed
```