cron Scheduled jobs

START HERE

`crontab -e`
Edit your crontab

`crontab -l`
List your crontab

`crontab -n` *`<file>`*
Syntax check only

`*/5 * * * *` *`<cmd>`*
Every 5 minutes

`0 2 * * *` *`<cmd>`*
Daily at 02:00

`@reboot` *`<cmd>`*
Once at daemon start

`MAILTO=""`
Silence output mail

`<cmd>` **`>>`** *`<log>`* **`2>&1`**
Capture output

CONCEPTS

Cron wakes every minute and runs jobs whose five time fields match. Jobs run with a minimal environment and no terminal, so use absolute paths and set PATH yourself.

min	hour	dom	month	dow
0-59	0-23	1-31	1-12	0-7

Field order, left to right (not nested)

If both day-of-month and day-of-week are restricted (not *), the job runs when either matches, not both. 30 4 1,15 * 5 runs on the 1st, the 15th and every Friday.

MANAGING CRONTABS

`crontab -e`
Edit your crontab in $EDITOR

`crontab -l`
Show your installed crontab

`crontab -r`
Remove your crontab, no confirmation
No undo and it sits next to -e on the keyboard; use -i to be asked first.

`crontab -i -r`
Ask before removing

`crontab` *`<file>`*
Replace your crontab with a file

MANAGING CRONTABS (cont.)

`crontab -`
Replace your crontab from stdin

`crontab -n` *`<file>`*
Dry run: check syntax only

`crontab -u` *`<user>`* **`-l`**
List another user's crontab (root)

`crontab -u` *`<user>`* **`-e`**
Edit another user's crontab (root)

`crontab -l | crontab -`
Reinstall as-is (round trip)

`/etc/cron.d/`*`<file>`*
System job file, has a user field

`/etc/cron.daily/`
Scripts run by the system daily

`/etc/cron.allow /etc/cron.deny`
Who may use crontab
If cron.allow exists only listed users may use crontab and cron.deny is ignored; root is always allowed.

SCHEDULE SYNTAX

`* * * * *` *`<cmd>`*
Every minute

`*/15 * * * *` *`<cmd>`*
Every 15 minutes

`0 * * * *` *`<cmd>`*
Top of every hour

`30 4 * * *` *`<cmd>`*
Every day at 04:30

SCHEDULE SYNTAX (cont.)

`0 9 * * 1-5` *`<cmd>`*
Weekdays at 09:00

`0 0 1 * *` *`<cmd>`*
First of the month at midnight

`0 8,12,18 * * *` *`<cmd>`*
List: 08:00, 12:00, 18:00

`0 9-17/2 * * *` *`<cmd>`*
Range with step: 9, 11, 13, 15, 17

`0 6 * * mon` *`<cmd>`*
Names allowed for month and weekday
Use the first three letters. The man page disallows lists and ranges of names, so use numbers there.

`0 0 * * 0` *`<cmd>`*
Sundays (0 or 7)

`0 3 1-7 * * [ "$(date +\%a)" = Sun ] &&` *`<cmd>`*
First Sunday of the month

SPECIAL STRINGS

`@reboot`
Once when the cron daemon starts
Runs when cron starts, which can be before network or other services are up.

`@hourly`
Same as 0 * * * *

`@daily / @midnight`
Same as 0 0 * * *

`@weekly`
Same as 0 0 * * 0

SPECIAL STRINGS (cont.)

`@monthly`
Same as 0 0 1 * *

`@yearly / @annually`
Same as 0 0 1 1 *

ENVIRONMENT AND OUTPUT

`PATH=/usr/local/bin:/usr/bin:/bin`
Set PATH at the top (no $PATH)
Values are not expanded: PATH=$HOME/bin:$PATH and ~ do not work.

`SHELL=/bin/bash`
Choose the shell for commands

`MAILTO=`*`<addr>`*
Mail job output to this address

`MAILTO=""`
Never mail output

`<cmd>` **`>>`** *`<log>`* **`2>&1`**
Append stdout and stderr to a log

`<cmd>` **`> /dev/null 2>&1`**
Discard all output

`<cmd>` **`> /dev/null`**
Keep errors, drop normal output

`<cmd>` **`2>&1 | logger -t`** *`<tag>`*
Send output to syslog

ENVIRONMENT AND OUTPUT (cont.)

`date +\%F`
Escape % with a backslash
An unescaped % ends the command and the rest becomes stdin.

`<cmd>` **`# note`**
Trailing # is NOT a comment
The text is passed to the shell as part of the command line; only whole-line comments are safe in a crontab.

`flock -n` *`<lock>`* *`<cmd>`*
Skip if the previous run is still going

`sleep $((RANDOM \% 60));` *`<cmd>`*
Random delay (needs SHELL=bash, escape %)

DEBUGGING

`grep CRON /var/log/syslog`
See cron run lines (needs rsyslog)
Newer Debian has no /var/log/syslog unless rsyslog is installed; use journalctl -u cron.

`journalctl -u cron`
Cron log on systemd (cron.service on Debian)
The unit is crond on RHEL and Fedora.

`systemctl status cron`
Is the daemon running?

`env -i SHELL=/bin/sh PATH=/usr/bin:/bin` *`<cmd>`*
Test with a cron-like environment

DEBUGGING (cont.)

`run-parts --test /etc/cron.daily`
List what a cron.* dir would run

A job that works in your shell but fails in cron nearly always comes down to PATH, a relative path, a missing env variable or a % character.

For logging, dependencies and catching up after downtime, consider a systemd timer instead (systemctl list-timers).

RECIPES

Typical crontab header

```
SHELL=/bin/bash
PATH=/usr/local/bin:/usr/bin:/bin
MAILTO=you@example.com
# m  h  dom mon dow  command
15 3 * * *  /home/me/bin/backup.sh >> /home/me/backup.log 2>&1
```

Add one job without opening the editor

```
(crontab -l 2>/dev/null; echo '*/10 * * * * /home/me/bin/sync.sh') | crontab -
```

Non-overlapping job with a lock

```
*/5 * * * * flock -n /tmp/sync.lock /home/me/bin/sync.sh >> /home/me/sync.log 2>&1
```

Dated log files (note the escaped %)

```
0 1 * * * /home/me/bin/report.sh > /home/me/reports/$(date +\%F).txt 2>&1
```