



# Periodic Process

Computer System and Network Administration

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# CRON – Schedule Commands (1)

- What we want?
  - Do things at right time automatically
- cron daemon
  - The daemon that handles periodic execution
  - cron daemon reads configuration file and executes commands on time

`cron(8), crontab(1), crontab(5)`

# CRON – Schedule Commands (2)

- Configuration file
  - So called: crontab (cron table)
  - Location of user cron configuration file
    - Every user can have at most one crontab file and this file will be named the user's login ID

System	Cron Dir
FreeBSD	/var/cron/tabs
Red Hat	/var/spool/cron
Solaris	/var/spool/cron/crontabs
SunOS	/var/spool/cron/crontabs

- Location of System Cron Configuration file
  - /etc/crontab

# CRON – Schedule Commands (3)

- Configuration File Format

1. Ignored

- Blank lines or leading spaces and tabs

2. Comments

- pound-sign Lines whose first non-space character is a #

3. environment setting

- name = value
- Default environment variables:
  - LOGNAME, SHELL, PATH, HOME, MAILTO

4. cron command

Format:

**# minute hour day month weekday command**

33 7 \* \* \* /usr/local/bin/rsync -al --delete /home/ backup:/raid/home/

# CRON – Schedule Commands (4)

- cron command format – *minute hour day month weekday command*

Field	Description	Range
minute	Minute of the hour	0 ~ 59
hour	Hour of the day	0 ~ 23
day	Day of the month	1 ~ 31
month	Month of the year	1 ~ 12
weekday	Day of the week	0 ~ 6 (0 = Sunday)

## ❑ Rule Matching

- \* matches everything
- Single character matches exactly
- Dash(-) matches range
- Comma(,) matches any listed value
- Slash(/) matches skips of the number's value through the range.

# CRON – Schedule Commands (5)

- crontab time format example

45 10 * * 1-5	➔ AM 10:45, from Mon. to Fri.
10 * * * *	➔ On 10 minutes of each hour
*/3 * * * *	➔ Every three minutes
30 15 5 * *	➔ PM 3:30 of each 5-th day
0 0 14 2 *	➔ On the Midnight of Valentine's day
5 0-6 * * *	➔ On 5 minutes, from 0 to 6 o'clock.
0,30 * 13 * 5	➔ every half-hour on Fri. and every half-hour on the 13-th day

- crontab example

20 1 * * *	find /tmp -atime +3 -exec rm -f {} ‘;
55 23 * * 0-3,6	/home/tsaimh/cputemp-check.sh

# CRON – Schedule Commands (6)

- Special strings to specify the time

string	meaning	in 5 fields format
@reboot	Run once, at startup.	N/A
@yearly	Run once a year	0 0 1 1 *
@annually	(same as @yearly)	
@monthly	Run once a month	0 0 1 * *
@weekly	Run once a week	0 0 * * 0
@daily	Run once a day	0 0 * * *
@midnight	(same as @daily)	
@hourly	Run once an hour	0 * * * *

# crontab command

- crontab(1)

% crontab -e [-u user]

- Edit the [user's] crontab using editor

% crontab -l

- List the content of the crontab

% crontab -r

- Remove the current crontab

% crontab *filename*

- Install *filename* as your crontab



# crontab management

- To Allow or deny user
  - By default, all users can have their own crontab
  - allow file
    - A list of users that may use crontab, any other not in the list can not use it
  - deny file
    - Reverse meaning
- log

System	Allow or deny file	Log file
FreeBSD	/var/cron/{allow,deny}	By syslogd
Red Hat	/etc/cron.{allow,deny}	/var/log/cron
Solaris	/etc/cron.d/cron.{allow,deny}	/var/cron/log
SunOS	/var/spool/cron/cron.{allow,deny}	By syslogd

# System crontab: /etc/crontab

- System crontab
  - /etc/crontab

```
SHELL=/bin/sh
PATH=/etc:/bin:/sbin:/usr/bin:/usr/sbin
HOME=/var/log
#minute hour mday month wday who command
*/5 * * * * root /usr/libexec/atrun
*/11 * * * * operator /usr/libexec/save-entropy
0 * * * * root newsyslog
1 3 * * * root periodic daily
15 4 * * 6 root periodic weekly
30 5 1 * * root periodic monthly
1,31 0-5 * * * root adjkerntz -a
```

# periodic utility

- periodic utility
  - Run periodic system function under /etc/periodic

```
> ls -ld /etc/periodic/*
drwxr-xr-x  2 root  wheel 1024 Sep 26 21:43 /etc/periodic/daily
drwxr-xr-x  2 root  wheel  512 Sep 27 03:49 /etc/periodic/monthly
drwxr-xr-x  2 root  wheel  512 Sep 27 03:49 /etc/periodic/security
drwxr-xr-x  2 root  wheel  512 Sep 27 03:49 /etc/periodic/weekly
```

```
> ls /etc/periodic/daily
100.clean-disks      200.backup-passwd  405.status-ata-raid  430.status-rwho
110.clean-tmps       210.backup-aliases 406.status-gmirror   440.status-mailq
120.clean-preserve   300.calendar       407.status-graid3    450.status-security
130.clean-msgs       310.accounting     408.status-gstripe   470.status-named
140.clean-rwho       330.news           409.status-gconcat   500.queuerun
150.clean-hoststat   400.status-disks   420.status-network   999.local
```

- /etc/periodic.conf
- /etc/defaults/periodic.conf
- /usr/local/etc/periodic

```
[/usr/local/etc/periodic/security] > ls -al
total 8
drwxr-xr-x  2 root  wheel  512 Jan  7  2009 ./
drwxr-xr-x  4 root  wheel  512 Apr  7  2010 ../
-r-xr-xr-x  1 root  wheel 2286 Jan  7  2009 410.portaudit*
```

# at command

- at command
  - executes commands at a specified time
- at management
  - atq, atrm
  - /var/at/at.{allow,deny}

at(1), atrun(8)

```
% date
Wed Oct 23 12:17:17 CST 2013
% at 1218
touch file.1218
Job 6 will be executed using /bin/sh
% atq
Date                Owner      Queue  Job#
Wed Oct 23 12:18:00 CST 2013  tsaimh    c       6
% ls -l file.1218
-rw-r--r--  1 tsaimh  tsaimh  0 Oct 23 12:20 file.1218
```