



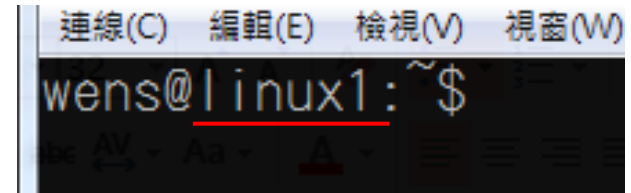
System Administration

System Configuration and Logs

System Configuration

- Normally all configuration files are found in */etc*
 - File format and settings depend on OS and distribution
 - BSD-like systems have */usr/local/etc* as well

Hostname

A terminal window with a menu bar at the top containing '連線(C)', '編輯(E)', '檢視(V)', and '視窗(W)'. The main area shows a shell prompt 'wens@linux1:~\$' where 'linux1' is underlined in red. Below the prompt, there are some faint, partially visible characters like '< > < >' and a red cursor arrow pointing to the right.

```
連線(C) 編輯(E) 檢視(V) 視窗(W)
wens@linux1:~$
```

- Set during boot
- Stored in kernel
- Reported by *hostname (1)* and *gethostname (2)*
- Not FQDN (DNS domain name)
- Set in */etc/hostname*
- Set by *hostname (1)*
 - `hostname "HOST"`
 - `hostname -F /etc/hostname`

Hostname Lookup

- Done by Libc resolver
 - gethostbyname (3)
 - getaddrinfo (3)
 - ...

Hostname Lookup

- */etc/hosts*
 - Static lookup table
 - All OS have it (even Windows)
 - Format: IP Hostname Alias...
- */etc/resolv.conf*
 - DNS Resolver (Name servers)
 - *resolvconf* package
 - Read DNS config from network config
 - Write settings to */etc/resolv.conf*

Network Interfaces

- */etc/network/interfaces*
 - Debian/Ubuntu specific
 - Format: *interfaces (5)*
 - 1 block per interface

/etc/network/interfaces

```
iface eth0 dhcp
```

```
iface eth1 static
```

```
address 10.1.1.6
```

```
netmask 255.255.255.0
```

```
gateway 10.1.1.254
```

```
dns-nameservers 8.8.8.8
```

System Time

- Show with *date*
- Set with "*date MMDDhhmmCCYY*"
- Network time synchronization
 - NTP
 - ntpdate
 - ntpd
 - www.stdtime.gov.tw

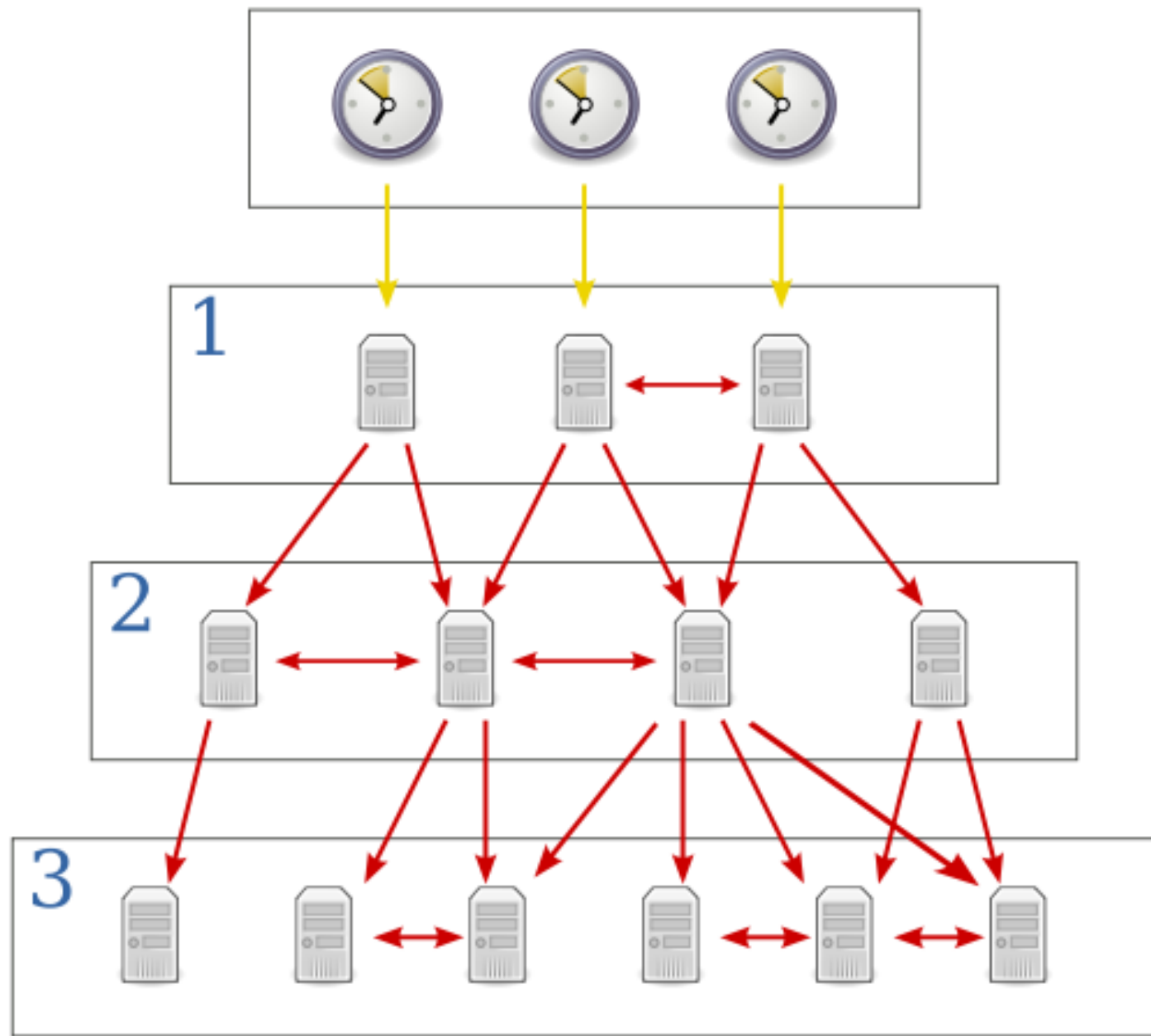
ntpdate

- Sync time once
 - `ntpdate time.stdtime.gov.tw`
 - `ntpdate tw.pool.ntp.org`
- Run with cron

ntpd

- Actively sync time with other servers
- Others can query you too

```
# Simple /etc/ntp.conf  
server time.stdtime.gov.tw  
server tw.pool.ntp.org
```



Daemon

- A program that runs in the background
 - 常駐程式

Scheduling Jobs

- at
 - Run once
 - at now + 1 hours
 - at 1pm tomorrow
 - at 12:00 2013-04-09

Scheduling Jobs (cont.)

- cron
 - Recurring jobs at given times
 - /etc/crontab
 - System-wide
 - Need to specify user
 - cron -e
 - Per user

mm hh DD MM WD [user] command
分 時 日 月 星期幾 [使用者] 指令

sysctl

- Kernel tunable variables
 - Memory/file/network limits
 - Network buffers
 - ...
- sysctl (8) tool
 - /proc/sys
- /etc/sysctl.conf

sudo

- Run command as another user
 - Controlled by */etc/sudoers*
 - Verify using *your* password
 - Give people limited superuser access

```
# Allow "admin" to run shutdown  
admin ALL = (root) /sbin/shutdown
```

- See `sudo (8)` and `sudoers (5)`

Users

- /etc/passwd
 - World readable
- root:x:0:0:root:/root:/bin/bash
 - login name
 - optional encrypted password
 - numerical user ID
 - numerical group ID
 - user name or comment field
 - user home directory
 - optional user shell

Users

- Passwords
 - Encrypted with crypt (3)
 - Originally DES
 - 8 chars only
 - \$1\$.....\$.....\$ means MD5 crypt
 - \$5\$.....\$.....\$ means SHA-256 crypt
- /etc/shadow
 - Encrypted passwords are still crackable
 - Put passwords in root-only file

Groups

- /etc/group
- nogroup:x:65534:
 - Name
 - Optional encrypted password
 - Numeric group ID
 - User list

User & Group Tools

- useradd / groupadd
- usermod / groupmod
- userdel / groupdel

- adduser / addgroup
- deluser / delgroup
- /etc/adduser.conf

Logs

- Normally stored in `/var/log`
- `syslog`
 - Catch-all: `/var/log/syslog`
- Application logs

syslog

- Traditional syslog
 - /etc/syslog.conf
- Debian moved to rsyslog
 - /etc/rsyslog.conf

```
# mail.* /var/log/mail.log
```

- See `syslog (3)` for facilities and priorities

Rotating logs

- Save / delete old logs
 - Compress old logs
 - Limit rotation to XX copies
- savelog (8)
- logrotate (8)
 - /etc/logrotate.conf
 - Run by cron

Homework

1. Write a crontab entry to reboot the system every Saturday at 1:00 AM
 - Use *shutdown* with correct arguments
2. Write a crontab entry to sync time using *ntpdate* every hour
 - Use `tw.pool.ntp.org`
3. Write a sudoers entry that allows *you* to run *ntpdate* without entering password
 - See sudoers (5)

Homework

4. What kind of logs are found in */var/log/auth.log*?
5. Write a sequence of commands to create 5 users with a common group.
 - The common group can be the primary group set in */etc/passwd*
 - Or auxiliary group set in */etc/group*
 - You can use `adduser`, `useradd` or even `echo`

Homework

- Write your answers in a PDF file
- 1 paragraph per answer
- Upload to CEIBA

Tips and Wishes

- Read about what we went through today
- Command names and file names are good keywords to look for
- Read manpages
- Look around the web for more reading material
- Visit the Library