

Linux基本操作

唐鈺軒

Advantages of using Linux over Windows

- **Cost**
 - The most obvious advantage of using Linux is the fact that it is free to obtain
- **Security**
 - the security aspect of Linux is much stronger than that of Windows.
- **Choice (Freedom)**
 - With Linux, you have the power to control just about every aspect of the operating system.
- **Software**
 - There are so many software choices when it comes to doing any specific task. You could search for a text editor on [Freshmeat](#) and yield hundreds, if not thousands of results.
- **Hardware**
 - Linux is perfect for those old computers with barely any processing power or memory you have sitting in your garage or basement collecting dust.

Putty- the interface between server with your OS

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[PuTTY Download Page](#) - [翻譯此頁]

LEGAL WARNING: Use of PuTTY, PSCP, PSFTP and Plink is illegal in countries where encryption is outlawed. I believe it is legal to use PuTTY, PSCP, PSFTP and ...
[www.chiark.greenend.org.uk/~sgtatham/putty/download.html](#) - 18k - 頁庫存檔 - 類似網頁

[PuTTY: a free telnet/ssh client](#) - [翻譯此頁]

A free telnet and SSH Client for Windows and Unix platforms. Includes FAQ, documentation and contact information.

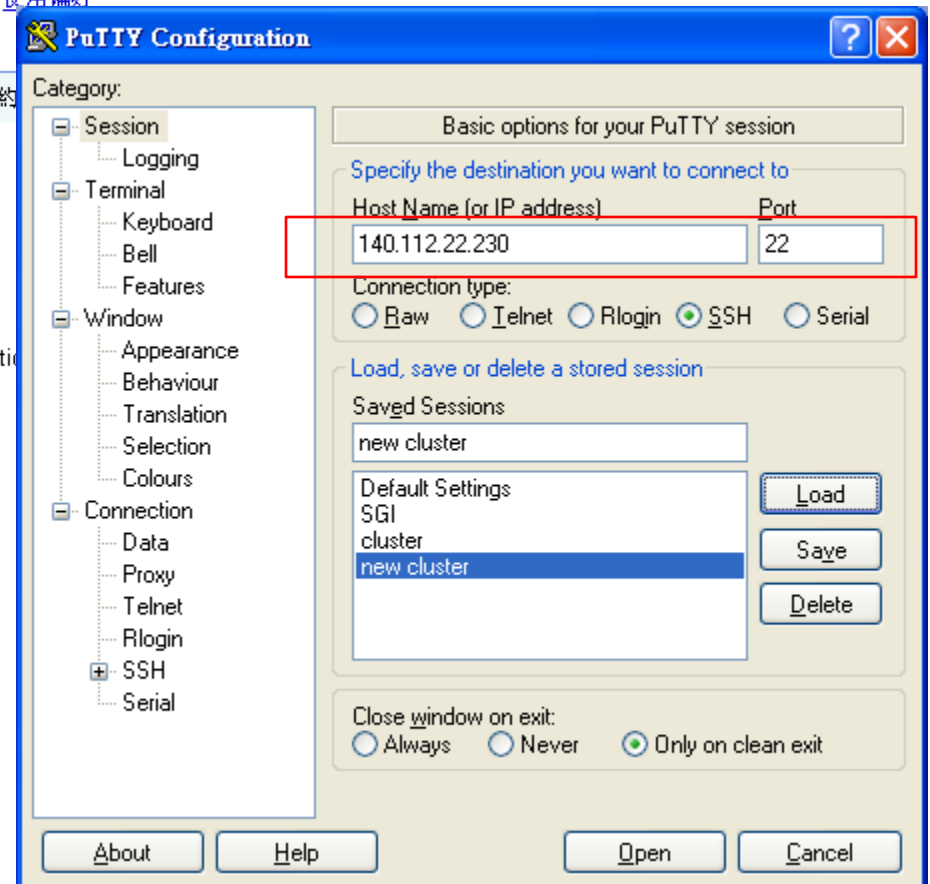
[www.chiark.greenend.org.uk/~sgtatham/putty/](#) - 4k - 頁庫存檔 - 類似網頁

[www.chiark.greenend.org.uk](#) 的其它相關資訊 >

[putty 入門教學](#)

putty.exe是一個可在windows平台上ssh連線的一套免費軟體。相容於Windows 95, 98, ME, ... 則putty會自動紀錄該server的指紋辨識碼,若有更動則會警告你。ssh連線成功! ...

[www.ascc.sinica.edu.tw/putty](#) - 10k - 頁庫存檔 - 類似網頁

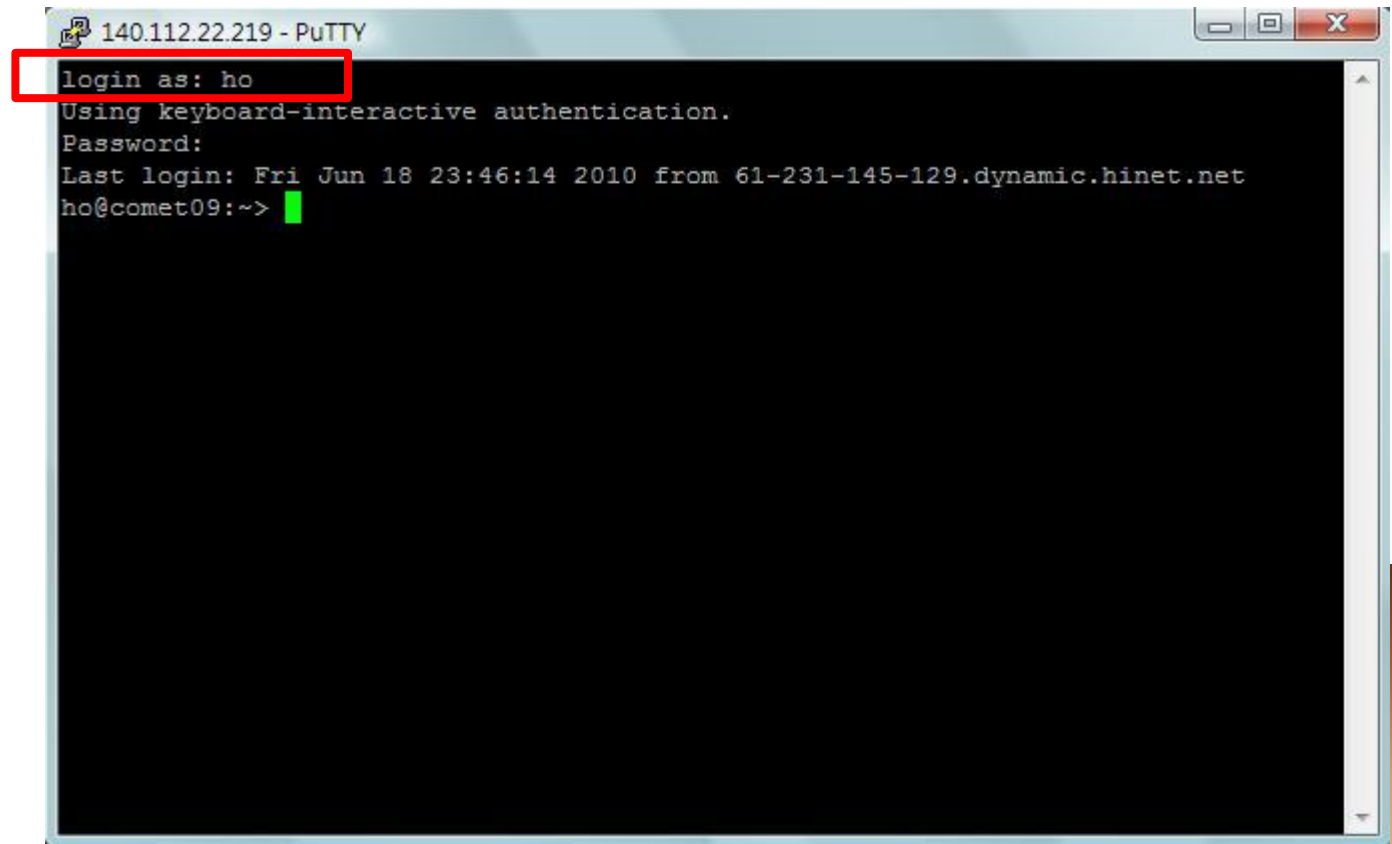


Download mobaxterm

The screenshot shows a Google search page for 'mobaxterm'. The search bar contains 'mobaxterm' and the search button is highlighted. Below the search bar, the text '搜尋' (Search) and '約有 326,000 項結果 (搜尋時間: 0.31 秒)' (About 326,000 results (search time: 0.31 seconds)) are visible. On the left side, there is a sidebar with navigation options: '全部' (All), '圖片' (Images), '地圖' (Maps), '影片' (Videos), '新聞' (News), '購物' (Shopping), and '更多' (More). Below the sidebar, there are sections for '搜尋所有網站' (Search all websites), '不限時間' (No time limit), and '更多搜尋工具' (More search tools). The main search results area shows a list of results. The first result is 'MobaXterm free X server and SSH client for Windows' from 'mobatek.net', which is highlighted with a red box. Below this result, there are links for 'Download', 'Functions', 'Plugins', and 'Documentation'. The 'Download' link points to 'MobaXterm Professional subscription. Installation ...'. The 'Functions' link points to 'MobaXterm Start up: MobaXterm is a single executable file. You ...'. The 'Plugins' link points to 'Here is the list of plugins that you can download and use to add ...'. The 'Documentation' link points to 'MobaXterm. (Unix utilities and X-server on Gnu/Cygwin) 1 ...'. Below the first result, there are other search results, including 'Download Free MobaXterm, MobaXterm 4.0 Download' from 'www.brothersoft.com' and 'Download MobaXterm 4.2 Free - Enhanced terminal with X se...' from 'www.softpedia.com'.

各階級的使用者

- Superuser - root
- User



The screenshot shows a PuTTY terminal window titled "140.112.22.219 - PuTTY". The terminal output is as follows:

```
login as: ho
Using keyboard-interactive authentication.
Password:
Last login: Fri Jun 18 23:46:14 2010 from 61-231-145-129.dynamic.hinet.net
ho@comet09:~>
```

The text "login as: ho" is highlighted with a red rectangular box. A green cursor is visible at the end of the prompt "ho@comet09:~>".

檔案/目錄

- 超級管理員目錄: `/root/`
- 家目錄: `/home/[username]`
家目錄就是登入時所在的位置, 以 `~` 表示
- `pwd`: 查詢目前位置
- `windonlake @ comet08 ~`
`comet08`: 所在主機名稱
`~`: 家目錄的代稱
`$`: 提示符號 (一般使用者)

```
[windonlake@comet08 ~]$ pwd  
/home/windonlake  
[windonlake@comet08 ~]$
```

切換主機位置

- 語法: `ssh [node/server name]`
- 離開: `exit` (or `logout`)

```
[windonlake@comet08 ~]$ ssh node3-1
Last login: Mon Dec 22 15:51:48 2008 from comet08

      THIS SYSTEM IS FOR AUTHORIZED USE ONLY
System managers may monitor and record activities on this system in
the course of maintenance or investigations into improper usage.
Anyone using this system expressly consents to such monitoring and is
advised that any resulting evidence of criminal activity may be
provided to law enforcement officials.

-----
o For user assistance send e-mail to stlin@ntu.edu.tw
-----

Disk quotas for user windonlake (uid 516):
  Filesystem  blocks   quota  limit  grace  files   quota  limit  grace
nfs_oscar:/home    448M  9766M 14649M    33392     0     0

Last login at

[windonlake@node3-1 ~]$ exit
logout
Connection to node3-1 closed.
[windonlake@comet08 ~]$
```

顯示檔案列表 (listing)

Tab

(自動完成)

`ls [path]`

顯示該目錄下所有檔案/目錄

`ls [path]P*`

顯示該目錄下所有P開頭的檔案

`ls [path]*.txt`

顯示該目錄下所有文件檔

`ls [path] - a`

顯示所有隱藏檔

`ls [path] - l`

詳細表列 (以檔名排序)

`ls [path] - t`

按照最後修改時間排列

`man [command]` 查詢說明手冊 (manual)

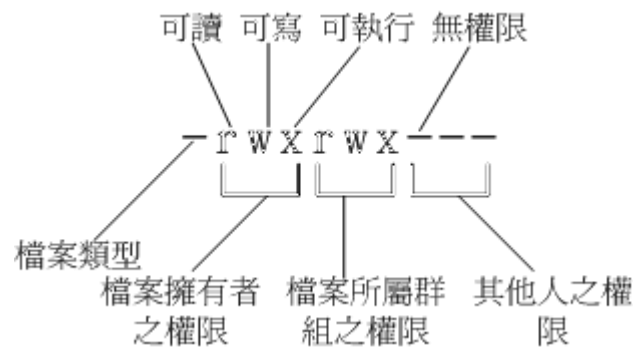
檔案個數
檔案擁有者
群組名稱
檔案大小
修改日期
檔名

```
ho@comet09:~> ls -l
total 9
-rw-r--r--  1 ho      users   0 2009-11-28 16:54 123
drwxrwx---  2 root    users  112 2010-03-04 17:06 bin
drwxrwx---  2 root    users   80 2009-10-23 16:36 Documents
drwxr-xr-x 15 ho      users  824 2010-06-17 15:29 job
drwxr-xr-x  3 ho      users  336 2010-05-26 22:34 program
drwxrwx---  2 root    users   80 2009-10-23 16:36 public_html
-rw-r--r--  1 ho      users   17 2010-06-01 15:24 root_pass
drwxrwx---  2 aracity users  200 2009-12-22 13:21 test
drwxr-xr-x  3 ho      users  120 2010-03-04 17:05 transfer_integral
-rw-r--r--  1 ho      users   37 2010-03-22 19:31 vi_command
ho@comet09:~>
```



```
ho@comet09:~> ls -l
total 9
-rw-r--r--  1 ho      users    0 2009-11-28 16:54 123
drwxrwx---  2 root    users  112 2010-03-04 17:06 bin
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drwxr-xr-x 15 ho      users  824 2010-06-17 15:29 job
drwxr-xr-x  3 ho      users  336 2010-05-26 22:34 program
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drwxrwx---  2 aracity users  200 2009-12-22 13:21 test
drwxr-xr-x  3 ho      users  120 2010-03-04 17:05 transfer_integral
-rw-r--r--  1 ho      users   37 2010-03-22 19:31 vi command
```

[權限] [連結] [擁有者][群組][檔案容量][修改日期][檔名]



更改檔案權限 `change mode`

進入目錄視為“執行動作”，所以目錄的預設權限是可執行檔

- 檔案權限表示法

```
drwxr-xr-x
```

檔案性質 user權限 group權限 others權限

- 指令: `chmod [option] [file/dir]`

八進位表示:

ex: `chmod 777 happy_day.txt`

相對權限表示 (要先知道原本設定)

rwx		

000	none	0
001	x	1
010	w	2
011	x+w	3
100	r	4
101	r+x	5
110	r+w	6
111	r+w+x	7

切換目錄 (change directory)

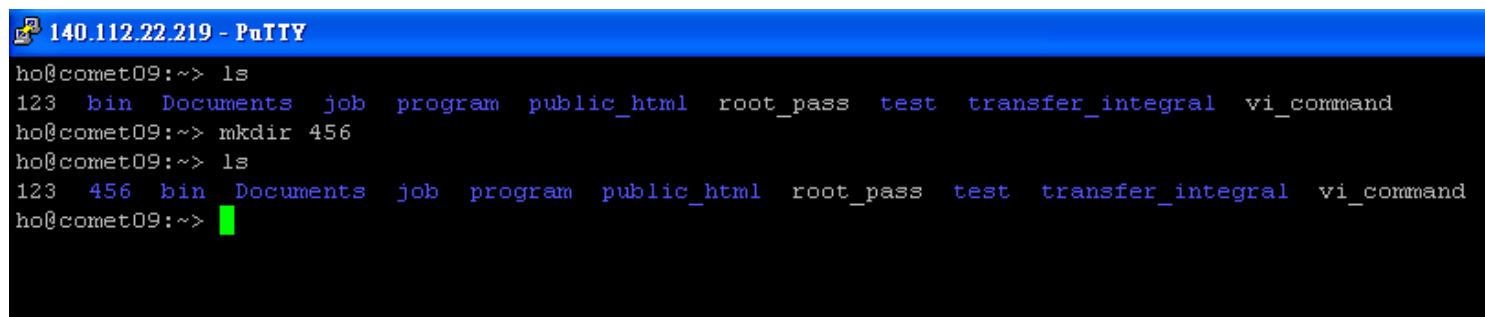
- `cd [path]`
- 絕對路徑：由根目錄(/)開始寫起的檔名或目錄名稱，例如 `/home/dmtsai/.bashrc`；
- 相對路徑：相對於目前路徑的檔名寫法。例如 `./home/dmtsai` 或 `../home/dmtsai/` 等等。反正開頭不是 `/` 就屬於相對路徑的寫法

Linux 常用指令

- `cp [source] [destination]`
- `cp -f directory newdirectory`
- `mv [source] [destination]`
- `rm [file]`
- `mkdir [directory]` **make** (empty) **directory**
- `rmdir [directory]` (`rm -r directory`) **remove** (empty) **directory**



```
140.112.22.219 - PuTTY
ho@comet09:~> cp 123 /home/ho/234
```



```
140.112.22.219 - PuTTY
ho@comet09:~> ls
123 bin Documents job program public_html root_pass test transfer_integral vi_command
ho@comet09:~> mkdir 456
ho@comet09:~> ls
123 456 bin Documents job program public_html root_pass test transfer_integral vi_command
ho@comet09:~>
```

NOTE:

1. `cp` 與 `mv` 都可用做檔案的“重新命名”，只是 `cp` 有保留原始檔而 `mv` 不會
2. 使用 `rmdir` 目錄下不能有檔案/子目錄 (包含隱藏檔)
3. Linux 沒有“資源回收桶” …刪檔請慎重!!

瀏覽檔案

- `cat` 由第一行開始顯示檔案內容
- `tac` 從最後一行開始顯示，可以看出 `tac` 是 `cat` 的倒著寫！
- `nl` 顯示的時候，順道輸出行號！
- `more` 一頁一頁的顯示檔案內容
- `less` 與 `more` 類似，但是比 `more` 更好的是，他可以往前翻頁！
- `head` 只看頭幾行
- `tail` 只看尾巴幾行
- `od` 以二進位的方式讀取檔案內容！

其他常用指令

- 更改密碼: `passwd`
- 查看有誰上線: `w` (或 `who`, `finger`)
- 清屏: `clear`
- 比較檔案內容: `diff [file1] [file2]`
- 找尋檔案: `find [file]`
`locate [file]`
(會搜尋其他使用者的目錄)
- 找尋關鍵字: `grep [keyword] [file]`

系統資訊與執行程序

- 顯示主機上在 run 的 job: `top`, `jobs`
- 移除執行中的程式：`k => [PID] =>(y/n)`

```
windonlake@comet08:/home/windonlake/phaseequil
top - 16:56:44 up 84 days, 5:33, 4 users, load average: 1.00, 1.00, 1.00
Tasks: 306 total, 2 running, 304 sleeping, 0 stopped, 0 zombie
Cpu(s): 15.6%us, 0.5%sy, 0.0%ni, 83.8%id, 0.1%wa, 0.0%hi, 0.0%si, 0.1%st
Mem: 3990272k total, 857080k used, 3133192k free, 11772k buffers
Swap: 8388600k total, 132416k used, 8256184k free, 185928k cached
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
29275	windonla	25	0	244m	231m	1688	R	100	5.9	130:29.47	phaseequil
2699	root	18	0	116m	948	692	S	3	0.0	4123:38	pcscd
29900	windonla	15	0	14868	1252	820	R	1	0.0	0:00.03	top
29431	windonla	16	0	14864	1256	820	S	0	0.0	0:20.79	top
1	root	15	0	10304	84	52	S	0	0.0	0:46.23	init
2	root	RT	0	0	0	0	S	0	0.0	0:03.46	migration/0
3	root	34	19	0	0	0	S	0	0.0	0:03.18	ksoftirqd/0
4	root	RT	0	0	0	0	S	0	0.0	0:00.00	watchdog/0
5	root	RT	0	0	0	0	S	0	0.0	0:02.41	migration/1
6	root	34	19	0	0	0	S	0	0.0	0:02.16	ksoftirqd/1
7	root	RT	0	0	0	0	S	0	0.0	0:00.00	watchdog/1
8	root	RT	0	0	0	0	S	0	0.0	0:02.05	migration/2
9	root	34	19	0	0	0	S	0	0.0	0:01.18	ksoftirqd/2
10	root	RT	0	0	0	0	S	0	0.0	0:00.00	watchdog/2
11	root	RT	0	0	0	0	S	0	0.0	0:01.77	migration/3
12	root	34	19	0	0	0	S	0	0.0	0:00.69	ksoftirqd/3
13	root	RT	0	0	0	0	S	0	0.0	0:00.00	watchdog/3
14	root	RT	0	0	0	0	S	0	0.0	0:01.99	migration/4
15	root	34	19	0	0	0	S	0	0.0	0:02.57	ksoftirqd/4
16	root	RT	0	0	0	0	S	0	0.0	0:00.00	watchdog/4
17	root	RT	0	0	0	0	S	0	0.0	0:01.84	migration/5
18	root	34	19	0	0	0	S	0	0.0	0:00.93	ksoftirqd/5
19	root	RT	0	0	0	0	S	0	0.0	0:00.00	watchdog/5
20	root	RT	0	0	0	0	S	0	0.0	0:01.53	migration/6
21	root	34	19	0	0	0	S	0	0.0	0:00.81	ksoftirqd/6
22	root	RT	0	0	0	0	S	0	0.0	0:00.00	watchdog/6

- 在node上執行Jobs：qsub [執行檔]
- 移除執行中的jobs：qdel [job編號]
- 各 node 的 job 資訊: showq, qstat
查詢各個 job 的位置: **qstat -n**

```
[windonlake@comet08 ~/phaseequil]$ showq
ACTIVE JOBS-----
JOBNAME          USERNAME        STATE  PROC   REMAINING          STARTTIME
3448              smkg           Running  8     INFINITY  Mon Dec 22 19:42:07
3728              smkg           Running  8     INFINITY  Mon Dec 29 16:30:39
3759              smkg           Running  8     INFINITY  Wed Dec 31 13:45:34
3821              smkg           Running  8     INFINITY  Sun Jan  4 17:32:42
3859              smkg           Running  8     INFINITY  Tue Jan  6 10:17:52
4075              Tung           Running  8     INFINITY  Wed Jan 14 09:21:58
4076              Tung           Running  8     INFINITY  Wed Jan 14 09:30:56
4078              Tung           Running  8     INFINITY  Wed Jan 14 09:54:11
4080              Tung           Running  8     INFINITY  Wed Jan 14 12:11:28
4138              Tung           Running  8     INFINITY  Fri Jan 16 10:47:34
4183              Tung           Running  8     INFINITY  Mon Jan 19 14:43:55
4184              Tung           Running  8     INFINITY  Mon Jan 19 14:49:15
4185              Tung           Running  8     INFINITY  Mon Jan 19 15:25:47
4219              Tung           Running  8     INFINITY  Thu Jan 22 09:16:43
4223              Tung           Running  8     INFINITY  Thu Jan 22 19:24:43
4224              Tung           Running  8     INFINITY  Fri Jan 23 23:21:09

    16 Active Jobs      128 of 128 Processors Active (100.00%)
                        16 of  16 Nodes Active      (100.00%)

IDLE JOBS-----
JOBNAME          USERNAME        STATE  PROC   WCLIMIT          QUEUETIME
4225              skylover       Idle    8     INFINITY  Thu Jan 22 22:22:05
4226              jyum          Idle    8     INFINITY  Sun Jan 25 00:12:48
4227              jyum          Idle    8     INFINITY  Sun Jan 25 00:46:32
4228              jyum          Idle    8     INFINITY  Sun Jan 25 00:48:13

    4 Idle Jobs

BLOCKED JOBS-----
JOBNAME          USERNAME        STATE  PROC   WCLIMIT          QUEUETIME

Total Jobs: 20  Active Jobs: 16  Idle Jobs: 4  Blocked Jobs: 0
[windonlake@comet08 ~/phaseequil]$
```

Linux 其他用法 1

- 設定環境參數如文字顯示顏色

```
[windonlake@comet08 ~]$ cd phaseequil
[windonlake@comet08 phaseequil]$ ls
127cpd.txt          COSMO_LINK          molecule.cpp        parameter.o         simplex.o
afjl.in             cosmo_link1         molecule.h          pbs_lcpu           system.cpp
ana.in              COSMO_LIST.txt     molecule.o          pbs_lcpu_bk        system.h
backup03262008     COSMO_VT2005.txt  mpi-former_PRSAC_bk pbs_lcpu_template  system.o
bashscr_example    cp_cal_add          mpi-PRSAC           phase.cpp           test02162008
binary_cal.txt     datainfo           mpi-PRSAC-1031     phaseequil          test.in
binary_cal.txt1    DIPPR_ref          mpi-PRSAC_LDNtest  phaseequil_bk       test.txt
binary_cal.txt11   eos.cpp            mpi_utilities      phaseequil.cpp      timing.cpp
calfile            eos.h              note                phaseequil_former  timing.h
calfile-08082008   eos.o              NO_VAP_DATA.txt   phaseequil_former_extend timing.o
calfile-09212008   erreval            old_version        phaseequil.o        valid-pt
calfile-09212008_backup LDN_coeff_file.txt opt_backup          phase.h             viaGdsp.opt1
calfile_1409       lqdmcl.cpp         optfile            phase.o             viaGdsp.opt2
calfilelist-09122008.txt lqdmcl.h          optfile-1030      PRtest1            VP_coeff_file.txt
CH-only.in         lqdmcl.o           optfile_1409      Puredata-20080911  z1.in
comet-cosmo        makefile.linux     optimization.cpp   Puredata-20080912  z1mod2.in
comet-outmol       marquardt.cpp     optimization.h     PureDataList-comet.txt z1mod3.in
conjgrad.cpp       marquardt.o        optimization.o     PureDataList-comet.txtbk z1mod4.in
conjgrad.o         mixture.cpp        outmol_VT2005.txt PuredataList-VT.txt z1modf.in
constant.h         mixture.h          parameter.cpp      ref                 z1mod.in
COSMO_DELETE       mixture.o          parameter.h        simplex.cpp
[windonlake@comet08 phaseequil]$ █
```

Linux- Script

- Why Script?
- 自動化管理的重要依據
- 追蹤與管理系統的重要工作
- 簡單入侵偵測功能
- 連續指令單一化

vi

Linux 下執行&操作模式

- 執行指令: `vi [filename]`
filename 可以是存在或不存在的
- 操作模式
 - Normal mode
 - Insert mode
 - Command-line mode
 - Visual mode
 - Others

常態模式 (N-Mode)

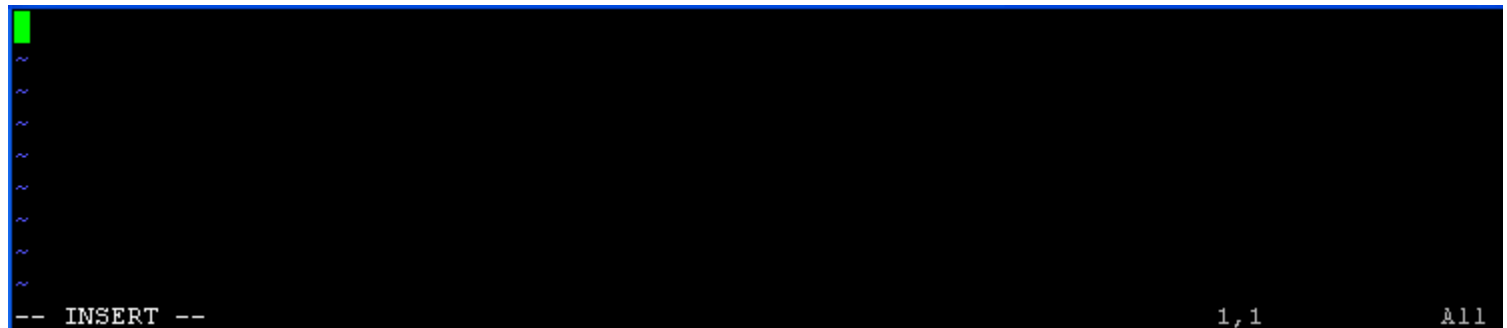
u / ctrl+R:	文件復原/取消復原
D/dd:	刪除一行
Y/yy:	複製一行
P/p:	貼上一行 (游標位置不一樣)
x/X:	刪除游標後/前一個字元
i/I(insert):	進入插入模式 (游標位置不一樣)
o/O:	Enter 後進入插入模式 (游標位置不一樣)
R(insert*2):	進入取代模式 (replace mode)
shift+V	進入反白模式 (visual mode)
/ 與 ? + [string]	向下/上搜尋文字, 使用 n/N 向下/上尋找下一筆

小撇步:

1. 數字 + dd/yy/p/P... 重複數次動作
2. d/y + \$/0/gg/G... 操作動作至行尾/行首/檔首/檔尾

插入模式 (I-Mode)

- 在N-Mode按a 進入文字編輯模式 (等同記事本)
由游標之後加入資料。 A 由該行之末加入資料。
i (insert) 由游標之前加入資料。 I 由該行之首加入資料。
o (open) 新增一行於該行之下供輸入資料之用。 O 新增一行於該行之上供輸入資料之用。 如何離開輸入模式 《ESC》 結束輸入模式。



命令列模式 (C-Mode)

- 指令必定以 : 開頭

:`[n]` 游標移至第n行

:`e [file]` 編輯檔案

:`w` 存檔

:`wq` 存檔並離開

:`q` 離開

(若未存檔會有詢問訊息)

:`q!` 強制離開

:`sp [file]` 視窗分割, 以 `ctrl+w j/k` 控制游標在上下視窗移動

:`h [string]` 呼叫help查詢與string相關的內容

:`[range] s/[replaced word]/[new word]/[options]` 取代關鍵字

ex: :`12,24 s/hello/hi/cegi`

補充

刪除、複製及搬移

- :10,20d 刪除第10行至第20行的資料。
- :10d 刪除第10行的資料。
- :%d 刪除整個編輯緩衝區。
- :10,20co30 將第10行至第20行的資料複製至第30行之後。
- :10,20mo30 將第10行至第20行的資料搬移至第30行之後。

字串搜尋與取代

s(substitute)指令可搜尋某行列範圍。

g(global)指令則可搜尋整個編輯緩衝區的資料。

s指令以第一個滿足該條件的字串為其取代的對象，若該行有數個滿足該條件的字串，也僅能取代第一個，若想取代所有的字串則需加上g參數。

- :1,\$s/old/new/g 將檔案中所有的『old』改成『new』。
- :10,20s/^ / 將第10行至第20行資料的最前面插入5個空白。
- :%s/old/new/g 將編輯緩衝區中所有的『old』改成『new』。

.恢復編輯時被中斷的檔案