



tmux

---

lctseng



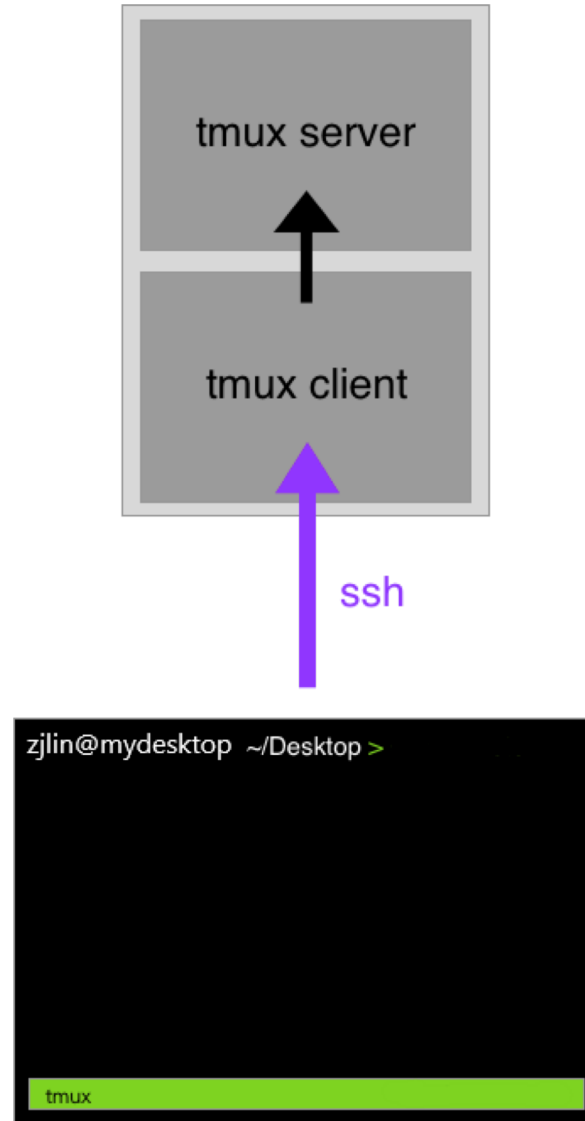
# What is tmux?

```
zjlin@nasa:~ %  
zjlin@nasa:~ %  
zjlin@nasa:~ %  
zjlin@nasa:~ %  
zjlin@nasa:~ %  
zjlin@nasa:~ %  
zjlin@nasa:~ %  
zjlin@nasa:~ %  
zjlin@nasa:~ %  
zjlin@nasa:~ %  
zjlin@nasa:~ %  
zjlin@nasa:~ %  
zjlin@nasa:~ %
```

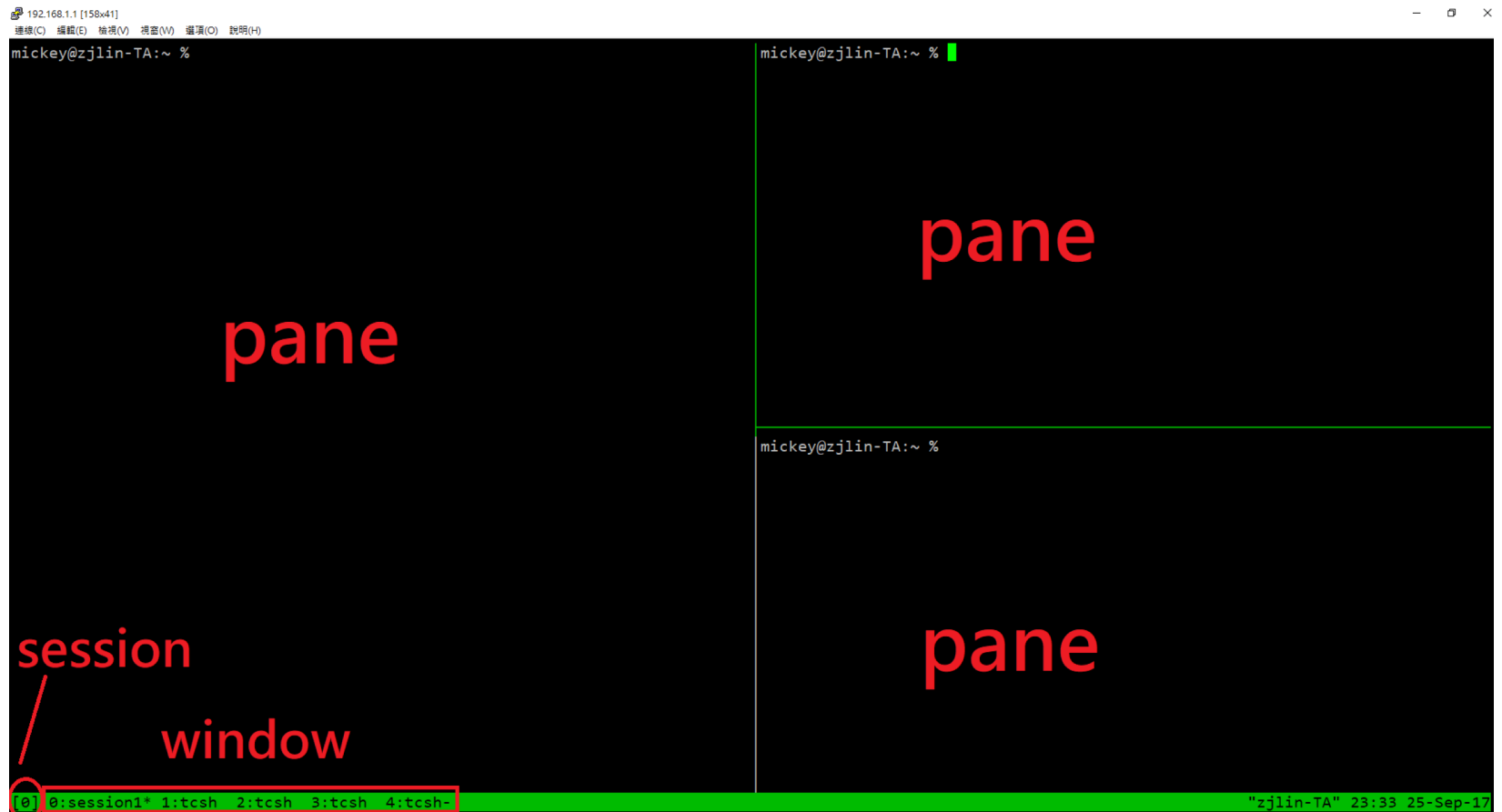


```
[0] 0:tcsh* 1:tcsh- 2:tcsh 3:tcsh 4:tcsh 5:tcsh 6:tcsh 7:tcsh
```

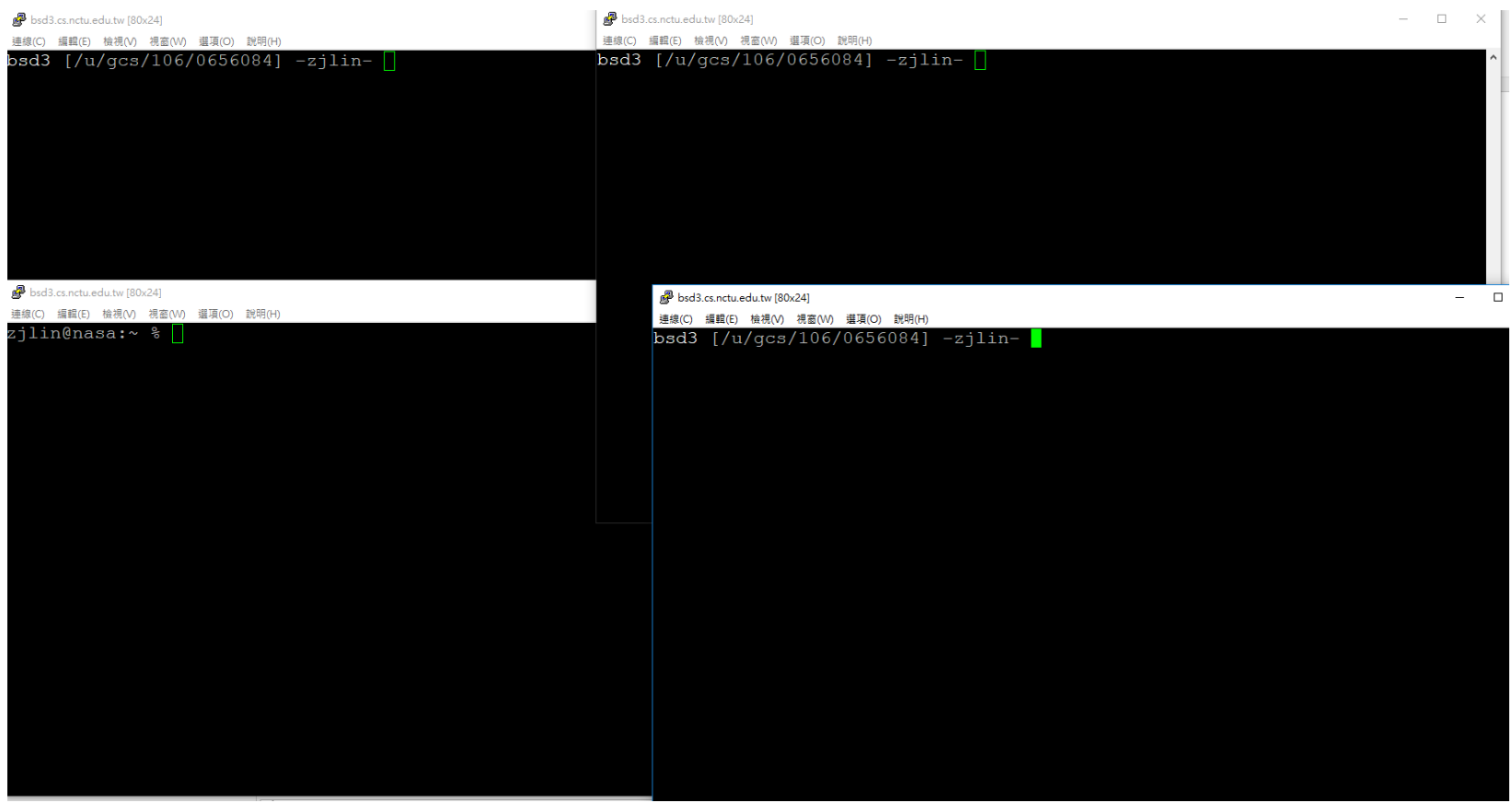
# What is tmux?



# What is tmux?



# Why should I use tmux?



# Why should I use tmux?

```
@WorkStationNCTU:~$ ifconfig
enp0s20f0u4c4i2 Link encap:Ethernet  HWaddr 3e:ab:8e:2e:f8:cf

    RX packets:0 errors:0 dropped:0 overruns:0 frame:0
    TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
    collisions:0 txqueuelen:1000
    RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

enp0s31f6 Link encap:Ethernet  HWaddr 
    inet addr:          Bcast:          Mask:255.255.255.0
    inet6 addr: fe80::9eb0:d0c1:882f:f2d6/64 Scope:Link
    UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
    RX packets:16212252 errors:0 dropped:651884 overruns:0 frame:0
    TX packets:11819759 errors:0 dropped:0 overruns:0 carrier:0
    collisions:0 txqueuelen:1000
    RX bytes:10013427582 (10.0 GB)  TX bytes:10220362185 (10.2 GB)
    Interrupt:16 Memory:f7000000-f7020000

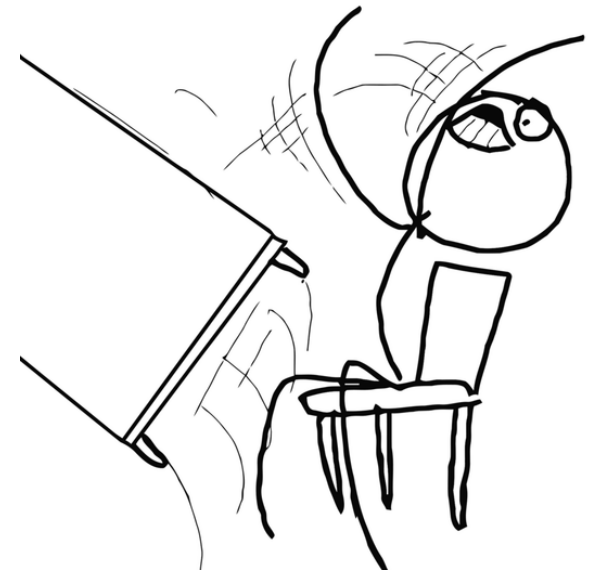
lo        Link encap:Local Loopback
    inet addr:127.0.0.1  Mask:255.0.0.0
    inet6 addr: ::1/128 Scope:Host
    UP LOOPBACK RUNNING  MTU:65536  Metric:1
    RX packets:1134013 errors:0 dropped:0 overruns:0 frame:0
    TX packets:1134013 errors:0 dropped:0 overruns:0 carrier:0
    collisions:0 txqueuelen:1000

~          ~          ~          ~          ~

Last login: Mon Sep 25 11:13:14 on ttys000
```

# Why should I use tmux?

- ❑ Keep your working session alive
- ❑ By default, shell is **terminated** when connection is lost
  - Including any programs/editors opened
  - Any unsaved changes are **discarded without warning**
- ❑ tmux **will not be terminated** when connection is lost
  - Attach to previous sessions!





# Example screenshot of tmux

```

78 cat <<<EOF
79
80 [lctseng]
81
82
83
84
85 EOF
86 echo "^[[1;0m"
87 echo "^[[1;91mATTENTION!!^[[1;0m"
88 echo "Remember to modify ^[[1;91m.gitconfig^[[1;0m to set your own name and email address."
89 echo "Or you can run '^[[1;91mgit config --global user.name \"Your Name\"^[[1;0m' to set your name,"
90 echo "and '^[[1;91mgit config --global user.email you@example.com^[[1;0m' to set your email address"
91
92 username=`whoami`
93 if [ "${username}" != "lctseng" ]; then
94   echo "[Git configuration]"

```

Tasks: 398, 0 thr; 4 runn  
Load average: 0.19 0.21 0  
Uptime: 190 days(!), 02:5



USER	PID	PPID	UID	RES	CPU%	MEM%	TIME
lctseng	52	0	8844	5056 S	0.0	0.0	0:00.
lctseng	52	0	6944	2924 S	0.0	0.0	0:00.
lctseng	52	0	7148	3124 S	0.0	0.0	0:00.
lctseng	22	0	8972	5984 S	0.0	0.0	0:00.
lctseng	52	0	8972	5980 S	0.0	0.0	0:00.
lctseng	52	0	7148	2984 S	0.0	0.0	0:00.
hlku	20	0	208M	53148 S	0.0	0.3	5h39:
root	-16	0	0	5632 S	0.0	0.0	56h03:
lctseng	20	0	21124	9600 S	0.0	0.1	0:18.
hlku	20	0	108M	44004 S	0.0	0.3	51:20.

```

INSERT  master  setup.sh  sh  utf-8[unix]  62%  78: 4  [79]tr
-- INSERT --

TMUX(1)      FreeBSD General Comma  19:34 lctseng@alumni(140.113.235.116) [~]
nds Manual  TMUX(1)
[T5] % ls -al | wc > outfile

NAME
tmux - terminal multiplexer

SYNOPSIS
tmux [-2CluvV] [-c shell-command] [-f file]
[-L socket-name]
[-S socket-path] [command [flags]]

DESCRIPTION
tmux is a terminal multiplexer: it enables a number of terminals to be created, accessed, and controlled from a single screen. tmux may be detached from a screen and continue running in the background, then later reattached.

:
alumni 0-zsh 1-zsh 2-ssh 3-ssh 4-ssh
7:34PM up 190days, 2:56, [0.19, 0.21, 0.19]

```



<https://github.com/lctseng/Unix-User-Config/blob/master/.tmux.conf>

# Advantages of tmux

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- ❑ Multiple sessions, windows, panes
- ❑ Keep the sessions, attach/detach anytime
- ❑ Powerful window division (panes)
- ❑ Share screen by attaching to the same session



# Start tmux

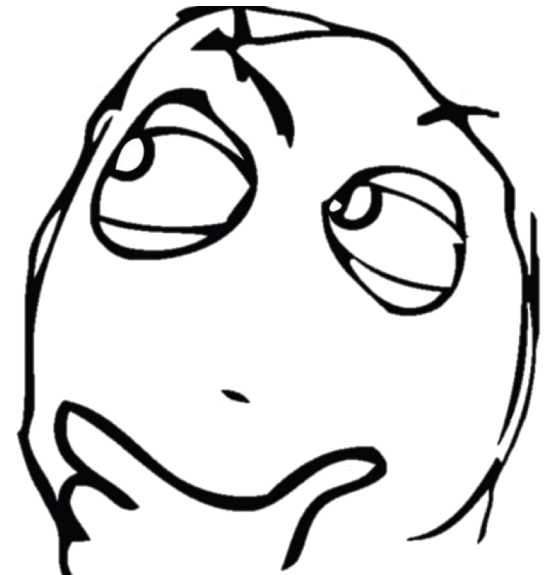
---

- `tmux`
- `tmux attach [ -t <number> ]`
- `tmux detach`
- `tmux ls`
- `tmux kill-session [ <number> ]`

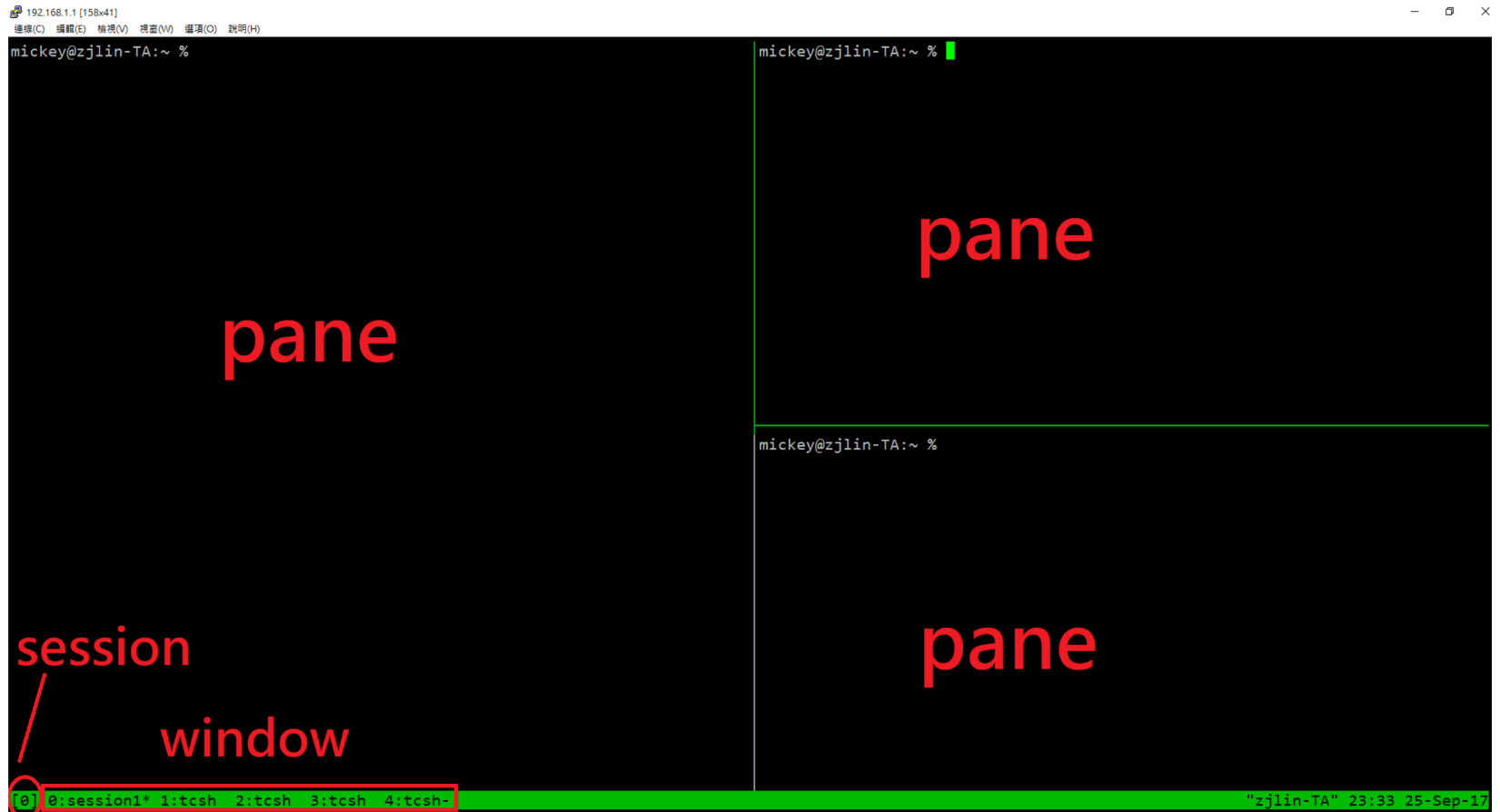
# tmux - session, window, pane

---

- ❑ session – browser
  - You can open multiple sessions by opening lots of terminals
- ❑ window – tab
  - One session can have multiple windows
- ❑ pane - split window
  - A window can be split into multiple panes



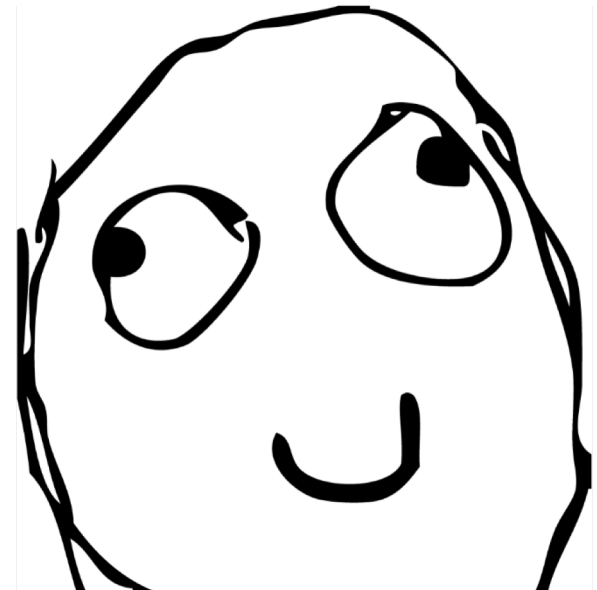
# tmux - session, window, pane



# tmux 101

---

Basic operations and configurations




# Session

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- ❑ Create new session (open a new browser)
  - Execute outside of any tmux sessions
  - `$ tmux`
- ❑ Detach current session
  - When attached in a session
  - `$ tmux detach`
  - Or close the terminal directly
- ❑ Attach to previous session
  - `$ tmux attach`
  - Attach only if previous sessions exist

# Multiple sessions (1)

## ❑ Open multiple browsers



The screenshot shows a terminal window with a black background and a yellow title bar. The terminal displays the following text:

```
連線(C) 編輯(E) 檢視(V) 視窗(W) 選項(O) 說明(H)
(0) + 0: 5 windows (attached)
(1) + 1: 2 windows
```

At the bottom of the terminal, a green status bar shows the current session and window information:

```
[0] 0:session1- 1:[tmux] 2:tcsh 3:[tmux]* 4:tcsh "zjlin-TA" 09:24 27-Sep-17
```



## Multiple sessions (2)

---

Open multiple browsers

List opened sessions

- \$ tmux list-sessions

```
0: 1 windows (created Sun Jun 16 18:49:57 2019) [128x38]
```

```
1: 3 windows (created Sun Jun 16 18:50:03 2019) [128x38]
```

Attach to previous session by id

- \$ tmux attach -t **session-id**

# tmux - bindkey

---

- ❑ Operations start with a special key combination
- ❑ Default is C-b
  - Where C is Ctrl (control)

# tmux - command

---

- ❑ Bindkey + :
- ❑ Open command prompt and execute tmux commands

```
10:32 lctseng@alumni(140.113.235.116) [~]
[T0] %
10:32 lctseng@alumni(140.113.235.116) [~]
[T0] %
:next-window
```

# Bindkey - window

<b>bindkey</b> (default is C-b) //C == control	<b>c</b>	<b>new-window</b>
	<b>n</b>	<b>next-window</b>
	<b>p</b>	<b>previous-window</b>
	<b>l</b>	<b>last-window</b>
	<b>&lt;num&gt;</b>	<b>select-window -t := &lt;num&gt;</b>
	<b>&amp;</b>	<b>confirm-before -p "kill-window #W? (y/n)" kill-window</b>
	<b>,</b>	<b>command-prompt -I "#W" "rename-window '%/%'"</b>
	<b>.</b>	<b>command-prompt "move-window -t '%/%'"</b>

# Bindkey - pane

<b>bindkey</b> (default is C-b) //C == control	<b>%</b>	<b>split-window -h</b>
	<b>“</b>	<b>split-window</b>
	<b>arrow-key</b>	<b>select-pane</b>
	<b>alt+arrow-key</b>	<b>resize-pane</b>
	<b>x</b>	<b>confirm-before -p "kill-pane #P? (y/n)" kill-pane</b>
	<b>{</b>	<b>swap-pane -U</b>
	<b>}</b>	<b>swap-pane -D</b>

# tmux - bindkey

## □ bindkey + ?

```

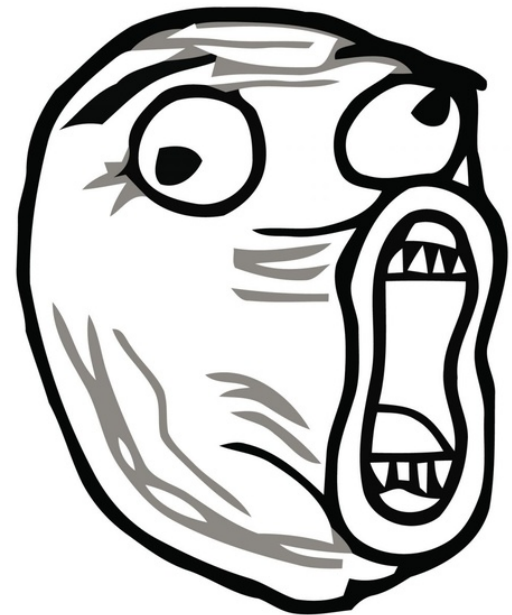
192.168.1.1 [158x41]
連線(C) 編輯(E) 檢視(V) 搜尋(W) 選項(O) 說明(H)
bind-key -T prefix $
bind-key -T prefix %
bind-key -T prefix &
bind-key -T prefix '
bind-key -T prefix (
bind-key -T prefix )
bind-key -T prefix ,
bind-key -T prefix -
bind-key -T prefix .
bind-key -T prefix 0
bind-key -T prefix 1
bind-key -T prefix 2
bind-key -T prefix 3
bind-key -T prefix 4
bind-key -T prefix 5
bind-key -T prefix 6
bind-key -T prefix 7
bind-key -T prefix 8
bind-key -T prefix 9
bind-key -T prefix :
bind-key -T prefix ;
bind-key -T prefix =
bind-key -T prefix ?
bind-key -T prefix D
bind-key -T prefix L
bind-key -T prefix M
bind-key -T prefix [
bind-key -T prefix ]
bind-key -T prefix c
bind-key -T prefix d
bind-key -T prefix f
bind-key -T prefix i
bind-key -T prefix l
bind-key -T prefix m
bind-key -T prefix n
bind-key -T prefix o
bind-key -T prefix p
bind-key -T prefix q
bind-key -T prefix r
bind-key -T prefix s
command-prompt -I "#S" "rename-session '%%"
split-window -h
confirm-before -p "kill-window #W? (y/n)" kill-window
command-prompt -p index "select-window -t ':%%"
switch-client -p
switch-client -n
command-prompt -I "#W" "rename-window '%%"
delete-buffer
command-prompt "move-window -t '%%"
select-window -t :=0
select-window -t :=1
select-window -t :=2
select-window -t :=3
select-window -t :=4
select-window -t :=5
select-window -t :=6
select-window -t :=7
select-window -t :=8
select-window -t :=9
command-prompt
last-pane
choose-buffer
list-keys
choose-client
switch-client -l
select-pane -M
copy-mode
paste-buffer
new-window
detach-client
command-prompt "find-window '%%"
display-message
last-window
select-pane -m
next-window
select-pane -t :.+
previous-window
display-panes
refresh-client
choose-tree
[0] 0:session1- 1:[tmux] 2:tcsh 3:[tmux] 4:tcsh

```

# Configuration - tmux.conf

---

- ~/.tmux.conf
- design yourself style
- colorful



ultra.com.br





# Configuration - bindkey

## ❑ ~/.tmux.conf

- bind-key ( alias: bind )
- C ( alias: <Ctrl> )
- M ( alias: <Alt> )

## ❑ bind-key <key> <command>

- -T key-table ( default table is prefix )
- -n : alias for -T root → don't need to press C-b first
- -r : repeat

```
22 # BIND KEY
23 bind -n F8 previous-window
24 bind -n F9 next-window
25 bind -n F10 last-window
26 bind -n M-Right next-window
27 bind -n M-Left previous-window
```

# Configuration - set

- ❑ ~/.tmux.conf
  - set-window-option ( alias: setw )

```
1 set -g status-utf8 on
2 setw -g utf8 on
3 # GENERAL SETTING
4 bind-key r source-file ~/.tmux.conf; display-message "~/.tmux.conf is reloaded"
5 set-window-option -g automatic-rename off
6 set-option -g default-terminal "xterm"
7 set-option -g prefix C-a
8
9 # STATUSBAR STYLE
10 # main
11 set-option -g status-bg colour236
12 set-option -g status-fg colour166
13 setw -g window-status-current-format "#I:#W#F"
14 setw -g window-status-current-fg colour215
15
16 #left
17 set-option -g status-left ''
18 set-option -g status-left-length 0
19
20 #right
21 set-option -g status-right "#h [%Y-%m-%d %H:%M]"
```

# Configuration - set

	colour1	colour2	colour3	colour4	colour5	colour6	colour7
colour8	colour9	colour10	colour11	colour12	colour13	colour14	colour15
	colour17	colour18	colour19	colour20	colour21	colour22	colour23
colour24	colour25	colour26	colour27	colour28	colour29	colour30	colour31
colour32	colour33	colour34	colour35	colour36	colour37	colour38	colour39
colour40	colour41	colour42	colour43	colour44	colour45	colour46	colour47
colour48	colour49	colour50	colour51	colour52	colour53	colour54	colour55
colour56	colour57	colour58	colour59	colour60	colour61	colour62	colour63
colour64	colour65	colour66	colour67	colour68	colour69	colour70	colour71
colour72	colour73	colour74	colour75	colour76	colour77	colour78	colour79
colour80	colour81	colour82	colour83	colour84	colour85	colour86	colour87
colour88	colour89	colour90	colour91	colour92	colour93	colour94	colour95
colour96	colour97	colour98	colour99	colour100	colour101	colour102	colour103
colour104	colour105	colour106	colour107	colour108	colour109	colour110	colour111
colour112	colour113	colour114	colour115	colour116	colour117	colour118	colour119
colour120	colour121	colour122	colour123	colour124	colour125	colour126	colour127
colour128	colour129	colour130	colour131	colour132	colour133	colour134	colour135
colour136	colour137	colour138	colour139	colour140	colour141	colour142	colour143
colour144	colour145	colour146	colour147	colour148	colour149	colour150	colour151
colour152	colour153	colour154	colour155	colour156	colour157	colour158	colour159
colour160	colour161	colour162	colour163	colour164	colour165	colour166	colour167
colour168	colour169	colour170	colour171	colour172	colour173	colour174	colour175
colour176	colour177	colour178	colour179	colour180	colour181	colour182	colour183
colour184	colour185	colour186	colour187	colour188	colour189	colour190	colour191
colour192	colour193	colour194	colour195	colour196	colour197	colour198	colour199
colour200	colour201	colour202	colour203	colour204	colour205	colour206	colour207
colour208	colour209	colour210	colour211	colour212	colour213	colour214	colour215
colour216	colour217	colour218	colour219	colour220	colour221	colour222	colour223
colour224	colour225	colour226	colour227	colour228	colour229	colour230	colour231
	colour233	colour234	colour235	colour236	colour237	colour238	colour239
colour240	colour241	colour242	colour243	colour244	colour245	colour246	colour247
colour248	colour249	colour250	colour251	colour252	colour253	colour254	colour255

# tmux - share session

- ❑ Both side can edit and execute commands

```
mickey@zjlin-TA:~ %  
mickey@zjlin-TA:~ % ping 8.8.8.8  
PING 8.8.8.8 (8.8.8.8): 56 data bytes  
64 bytes from 8.8.8.8: icmp_seq=0 ttl=58 time=3.185 ms  
64 bytes from 8.8.8.8: icmp_seq=1 ttl=58 time=3.229 ms  
64 bytes from 8.8.8.8: icmp_seq=2 ttl=58 time=3.611 ms  
64 bytes from 8.8.8.8: icmp_seq=3 ttl=58 time=3.626 ms  
█  
[0] 0:session1- 1:[tmux] 2:tcsh 3:ping* 4:tcs> "zjlin-TA" 09:20 27-Sep-17
```

```
mickey@zjlin-TA:~ %  
mickey@zjlin-TA:~ % ping 8.8.8.8  
PING 8.8.8.8 (8.8.8.8): 56 data bytes  
64 bytes from 8.8.8.8: icmp_seq=0 ttl=58 time=3.185 ms  
64 bytes from 8.8.8.8: icmp_seq=1 ttl=58 time=3.229 ms  
64 bytes from 8.8.8.8: icmp_seq=2 ttl=58 time=3.611 ms  
64 bytes from 8.8.8.8: icmp_seq=3 ttl=58 time=3.626 ms  
█  
[0] 0:session1- 1:[tmux] 2:tcsh 3:ping* 4:tcs> "zjlin-TA" 09:20 27-Sep-17
```

# Reference

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- ❑ tmux (1)
- ❑ tmux shortcuts & cheatsheet
  - <https://gist.github.com/MohamedAlaa/2961058>
- ❑ tmux brief introduction (chinese)
  - <https://5xruby.tw/posts/tmux/>

# Appendix: tmux v.s. screen

	<b>tmux</b>	<b>screen</b>
<b>window split</b>	top-down & left-right	top-down only (default)
	different sessions can have different schemes	scheme must shared by all sessions
<b>session</b>	switch between sessions without detach	detach first then re-attach another session
	multiple clients can attach to same session	one session for one client only (force detach)
<b>profile</b>	.tmux.conf	.screenrc
	highly customizable	less than tmux