

前瞻積體電路設計實驗室 – 使用方法與規則

Electronic Engineering High Performance
Computing (EEHPC)

Advisor: Prof. Chen-Yi Lee 李鎮宜 cylee@nycu.edu.tw

Author: Lin-Hung Lai 賴林鴻 lh lai@ieee.org

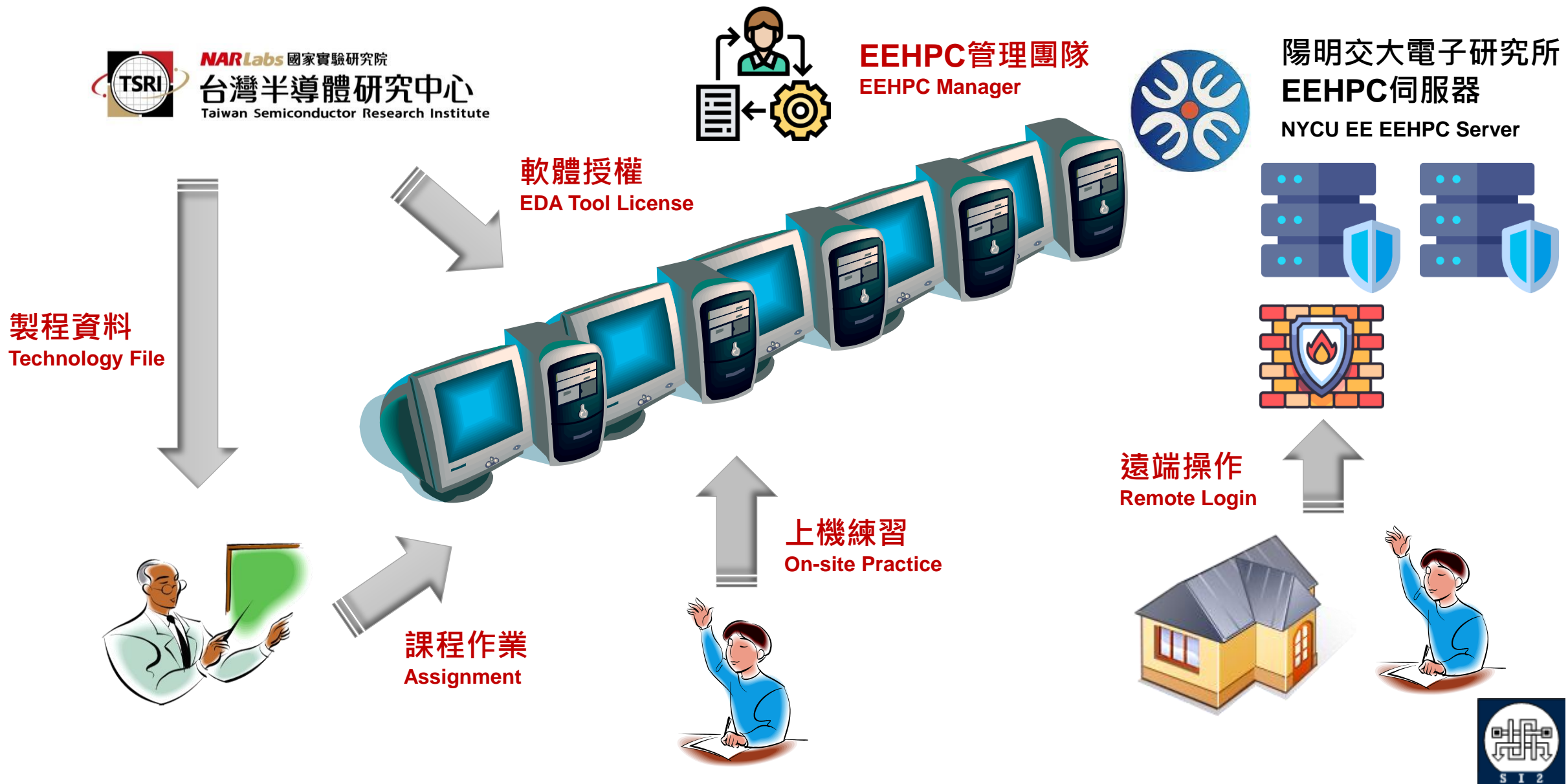
Sep. 15, 2023



國立陽明交通大學
NATIONAL YANG MING CHIAO TUNG UNIVERSITY

Si2
Lab System Integration
Silicon Implementation

工作站 Workstation



工作站硬體資訊 Workstation Hardware Information



NYCU EE High Performance Computing (Genral Purpose)					
Type	Host	CPU @ Clock (Core Numbers)	Memory	OS	SSD
Data	ee20	AMD EPYC™ 7543 @ 2.80GHz (128)	256G	CentOS 7.9	185T
General	ee21	AMD EPYC™ 7763 @ 2.45GHz (256)	1024G	CentOS 7.9	7.3T
General	ee22	AMD EPYC™ 7763 @ 2.45GHz (256)	1024G	CentOS 7.9	7.3T
General	ee23	AMD EPYC™ 7763 @ 2.45GHz (256)	1024G	CentOS 7.9	7.3T
General	ee24	AMD EPYC™ 7763 @ 2.45GHz (256)	1024G	CentOS 7.9	7.3T
General	ee25	AMD EPYC™ 7713 @ 2.00GHz (256)	1024G	CentOS 7.9	7.3T
General	ee26	AMD EPYC™ 7713 @ 2.00GHz (256)	1024G	CentOS 7.9	7.3T
General	ee27	AMD EPYC™ 7713 @ 2.00GHz (256)	1024G	CentOS 7.9	7.3T
General	ee28	AMD EPYC™ 7713 @ 2.00GHz (256)	1024G	CentOS 7.9	7.3T
General	ee29	AMD EPYC™ 7773X @ 2.2GHz (256)	1024G	CentOS 7.9	7.3T
General	ee30	AMD EPYC™ 7773X @ 2.2GHz (256)	1024G	CentOS 7.9	7.3T
TA/RA	ee31	AMD EPYC™ 7573X @ 2.95GHz (128)	512G	CentOS 7.9	7.3T
TA/RA	ee32	AMD EPYC™ 7573X @ 2.95GHz (128)	512G	CentOS 7.9	7.3T
TA/RA	ee33	Intel i7-12700 @ 4.9GHz (20)	64G	CentOS 8 Stream	1 T
TA/RA	ee34	Intel i7-12700 @ 4.9GHz (20)	64G	CentOS 8 Stream	1 T
TA/RA	ee35	Intel i7-12700 @ 4.9GHz (20)	64G	CentOS 8 Stream	1 T

工作站使用說明 Server Usage

• 使用原則 Policy

1. 每位學生帳號將會限制在**30G**用量
2. 今年新採購的伺服器為 **ee21~ee30** 歡迎多加使用
3. 每位學生帳號至多使用**8顆CPU**跑單一程式 / Memory 總用量 **100GB**

Only 30GB storage is provided for each student

New servers ee21~30 are encourage to use

Maximum: CPU 8 cores / Memory 100GB are allowed

• 使用技巧 Tips

1. 指令: **scheck** --> 查看所有伺服器狀態(挑狀態比較好的連線)
2. 指令: **htop** --> 查看當前伺服器的狀態
3. 指令: **quota -us [username]** --> 查看目前容量限制狀態

Use “scheck” command to get all available server’s info

Use “htop” command to get this server’s info

Use “quota” command to get usage of storage

• 違規行為 Rules

❑ 以下行為使用者帳號將會**立即取消**，並登記使用者資料**列入黑名單**

1. 將修課帳號借給他人使用，或借用他人帳號
2. 使用本實驗室電腦設備用於非課程教學用途
3. 破壞系統或實驗室設備，或任何影響系統運作的行為
4. 入侵系統或盜取、盜用他人帳號
5. 違反臺灣學術網路管理規範

You would be suspended right away and be in blacklist if you:

- (1) Borrow your account or borrow other’s account
- (2) Unusual usage of server, especially not related to course
- (3) Destroy equipment or system on purpose
- (4) Stealing other’s account or invading the system
- (5) Violate <https://reurl.cc/GKde0D>

❑ 以下行為**初犯帳號停權兩星期**，**累犯取消課程帳號**

1. 超過使用家目錄空間限制，以致帳號鎖定無法使用
2. 過量使用實驗室主機資源，影響其他人正常使用

You would be suspended for 2 weeks, or permanently if you:

- (1) Over-usage of maximum storage
- (2) Over-usage of computational resources

❑ 其他違規事宜，經個案討論認定違規者

Other serious violation would be punishment



查看所有伺服器狀態 Check status

- 你可以透過管理員架設的網站

ee20.ee.nctu.edu.tw 找到所有伺服器的 CPU

用量、Memory 用量、CPU負載，使用者數量，決定你要使用哪一台工作站。點選每台伺服器的節點名稱，可以監測單一工作站的使用狀況(很好用)。

- 也可以在每一台伺服器，輸入"**scheck**"指令，會列出所有伺服器更詳細的資訊，並且會根據各伺服器狀態目前狀態，自動推薦最佳的伺服器。
- 輸入"**chto ee21**"，即可切換至ee21伺服器。
(chto = ssh -X -p 415) 輸入"**glances**"指令可以監測單一工作站的使用狀況。

National Yang Ming Chiao Tung University
EEHPC Server Monitor Board

Node	Type	OS	Load Avg.	Up Time	Bandwidth	Flow	CPU	Memory	/tmp 2 %	/tmp 2 Free	User	Management
ee21	General	CentOS	4.68, 4.59, 4.64	31 days, 8:51:44	2.8 kB/s ↓ 5.9 kB/s ↑	260.4 GB ↓ 830.9 GB ↑	2.0%	2.0%	0.1%	7.4 TB	21	➔
ee22	General	CentOS	2.02, 2.08, 2.12	33 days, 12:11:47	4.7 kB/s ↓ 7.6 kB/s ↑	125.6 GB ↓ 400.0 GB ↑	0.8%	1.8%	0.0%	7.5 TB	20	➔
ee23	General	CentOS	0.11, 0.08, 0.06	11 days, 14:24:35	5.2 kB/s ↓ 6.1 kB/s ↑	116.0 GB ↓ 382.1 GB ↑	0.0%	3.5%	0.0%	7.5 TB	5	➔
ee24	General	CentOS	0.0, 0.13, 0.24	33 days, 13:33:46	2.9 kB/s ↓ 4.4 kB/s ↑	86.5 GB ↓ 257.2 GB ↑	0.0%	1.5%	0.0%	7.5 TB	8	➔

```
17:06 lhlai@ee31[~]$ scheck
```

Welcome to Use EEHPC Server Monitor Board (scheck)

1. Scheck intends to employ a 'cost function' incorporating LA, CPU, Mem, Users, and Freq to get normalized scores.
2. The term 'Rk' signifies rank, with a higher rank indicating better scores.
3. To switch to a better server, use the 'chto' command
4. Announcement: <https://www.lhlai.com/ed415>

Rk	Type	Host	Load Avg.	CPU	Mem	Users	MUsed (GB)	MFree (GB)	Model Name	Cores	Freq.
1	General	ee24	0.07%	0.0%	1.7%	12	15.24G	1063.54G	AMD 7763	256	2450
2	General	ee22	1.22%	0.9%	2.0%	20	18.11G	1060.51G	AMD 7763	256	2450
3	General	ee29	0.07%	0.0%	3.6%	4	36.11G	1042.67G	AMD 7773X	256	2200
4	General	ee30	0.02%	0.0%	3.4%	6	34.12G	1044.65G	AMD 7773X	256	2200
5	General	ee27	0.02%	0.0%	1.7%	3	14.92G	1063.83G	AMD 7713	256	2000
6	General	ee25	0.07%	0.0%	1.8%	13	16.16G	1062.54G	AMD 7713	256	2000
7	General	ee23	0.68%	0.4%	3.6%	8	36.49G	1042.47G	AMD 7763	256	2450
8	General	ee28	0.04%	0.0%	1.7%	5	15.34G	1063.44G	AMD 7713	256	2000
9	General	ee21	1.87%	2.6%	2.2%	32	20.17G	1058.51G	AMD 7763	256	2450
10	General	ee26	0.14%	0.0%	1.8%	12	16.20G	1062.58G	AMD 7713	256	2000
1	TA/RA	ee34	0.00%	0.0%	5.4%	2	2.57G	63.46G	i7-12700	24	4900
2	TA/RA	ee35	2.75%	0.0%	5.4%	4	2.62G	63.41G	i7-12700	24	4900
3	TA/RA	ee33	0.50%	0.1%	6.9%	6	3.47G	62.34G	i7-12700	24	4900
4	TA/RA	ee32	0.88%	0.8%	2.2%	1	10.43G	528.71G	AMD 7573X	128	2800
5	TA/RA	ee31	1.04%	0.8%	4.6%	13	23.19G	515.66G	AMD 7573X	128	2800
1	Data	ee20	0.27%	0.1%	4.1%	6	9.76G	259.26G	AMD 7543	128	2800

Smart Recommend:
stu: ee24 TA/RA: ee34

Last updated:
2023-04-17--17:05:17

Get more info:
<http://ee20.ee.nctu.edu.tw> (Ctrl+Click)

Color	Recommend	Avai Number
Green	****	10
Blue	***	2
Yellow	**	4
Red	*	0
White		0

Type command chto ee24 to change server

National Yang Ming Chiao Tung University
Institute of Electronics
Managed by Si2 Lab

Click to get more tips:
<https://www.lhlai.com/ed415/tips>
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查看與清理儲存空間 Check storages

- 透過"**quota -us**"指令，查看個人帳號使用量。
- 透過"**quota -gs**"指令，查看群組空間使用量。
- 透過"**du -sh ./ * | sort -rh | head -10**"指令，找出當前資料夾內最大的10個檔案。

	目前空間使用量	最高空間限制(Hard) 一超過就會鎖定	檔案數目 (目前沒有限制)
個人帳號使用量	<pre>23:18 si2RA01@ee21[~]\$ quota -us Disk quotas for user si2RA01 (uid 10837): Filesystem space quota limit grace files quota limit grace ee20:/RAID2 5193M 46080M 51200M 0 0</pre>		
群組空間使用量	<pre>23:18 si2RA01@ee21[~]\$ quota -gs Disk quotas for group si2 (gid 10013): Filesystem space quota limit grace files quota limit grace ee20:/RAID2 27094M 950G 1024G 0 0</pre>		
	空間額度(soft) 超過會提醒，在寬限天數內修正即不會有問題	超過額度最多的寬限天數	

```
13:02 iclabta02@ee20[~/Lab02_demo/03_GATE]$ du -sh ./ * | sort -rh | head -10
3.5G    ./novas.fsdb
360K    ./QUEEN_SYN.sdf.X
176K    ./irun.log
12K     ./novas_dump.log
4.0K    ./irun.history
4.0K    ./09_clean
4.0K    ./01_run
0       ./output.txt
0       ./irun.key
0       ./input.txt
```

查看與清理儲存空間 Check storages

- 如何查看與清理儲存空間
 - 在跑模擬時，產生的 **tr0** 或 **fsdb**檔案通常都很大(超過**10G**)，很多使用者都會不小心超過使用限額。
 - 透過"**find ~/ -type f -size +1G -exec ls -l {} \;**"指令，定期找出當前家目錄當中超過**1G**的檔案。
 - 並透過"**rm -rf [your file]**"將大檔案刪除。

```
11:15 iclabta02@eee20[~]$ find ~/ -type f -size +1G -exec ls -l {} \;
-rw-r--r-- 1 iclabta02 iclab 1295293725 Mar  6 12:04 /RAID2/COURSE/iclab/iclabta02/Lab02_demo/03_GATE/QUEEN_SYN.fsdb
-rw-r--r-- 1 iclabta02 iclab 3757589709 Mar  6 17:04 /RAID2/COURSE/iclab/iclabta02/Lab02_demo/03_GATE/novas.fsdb
-rw-r--r-- 1 iclabta02 iclab 1295293725 Mar  6 14:22 /RAID2/COURSE/iclab/iclabta02/Lab02_demo_2/03_GATE/QUEEN_SYN.fsdb
-rw-r--r-- 1 iclabta02 iclab 3757589709 Mar  6 15:55 /RAID2/COURSE/iclab/iclabta02/Lab02_demo_2/03_GATE/novas.fsdb
11:15 iclabta02@eee20[~]$ rm -rf /RAID2/COURSE/iclab/iclabta02/Lab02_demo/03_GATE/QUEEN_SYN.fsdb
11:15 iclabta02@eee20[~]$ find ~/ -type f -size +1G -exec ls -l {} \;
-rw-r--r-- 1 iclabta02 iclab 3757589709 Mar  6 17:04 /RAID2/COURSE/iclab/iclabta02/Lab02_demo/03_GATE/novas.fsdb
-rw-r--r-- 1 iclabta02 iclab 1295293725 Mar  6 14:22 /RAID2/COURSE/iclab/iclabta02/Lab02_demo_2/03_GATE/QUEEN_SYN.fsdb
-rw-r--r-- 1 iclabta02 iclab 3757589709 Mar  6 15:55 /RAID2/COURSE/iclab/iclabta02/Lab02_demo_2/03_GATE/novas.fsdb
```

工作站連線資訊 Server Connection Information

- 可使用的工作站之IP Available Server IP

- ❑ ee{21~30}.ee.nctu.edu.tw

- E.g.: ee21.ee.nctu.edu.tw

- ❑ ee31~ee35為助教專用server 請同學不要使用

- ❑ [硬體規格請參閱](#)

- 學員帳號 Student Account

- ❑ [Course name]{No.}

- E.g.: iclab001

- ❑ 學員請參考帳號對照表 [Link](#) 找到對應的帳號使用 Please refer to “Link” to find our your account

- 預設密碼 Default Password

- ❑ 首次登入後，請立即使用指令“**passwd**”更改密碼 Please change password right away with “passwd” command after your first login

- 注意事項 Notification

- ❑ 基於資安防護，本學期開始 SSH 僅開放 **Port 415** 連線
並且全部伺服器都須是交大IP 才可連線

- ❑ 若無交大IP，可連學校[VPN](#)

- ❑ 遠端桌面XRDP 僅開放 **Port 4151** 連線

Port 415 is used for ssh connection to prevent network attack
Only NYCU IP could be connected to server, e.g. 140.113.xxx.xxx

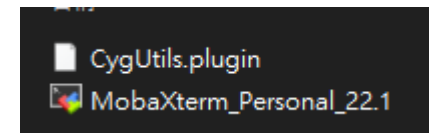
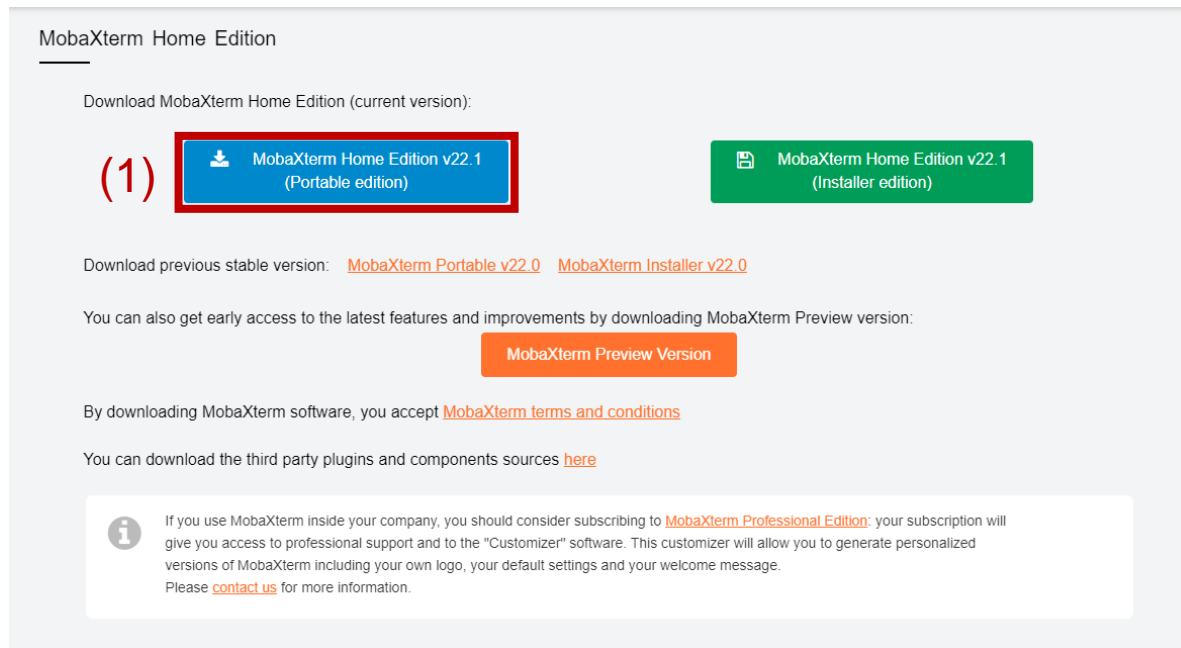
Connect NYCU VPN server without NYCU IP

Port 4151 is used for remote desktop connection



工作站連線方式 MobaXterm

- 下載網址 Download website: <https://mobaxterm.mobatek.net/download-home-edition.html>
- 安裝 Install



(2) 雙擊 Double click

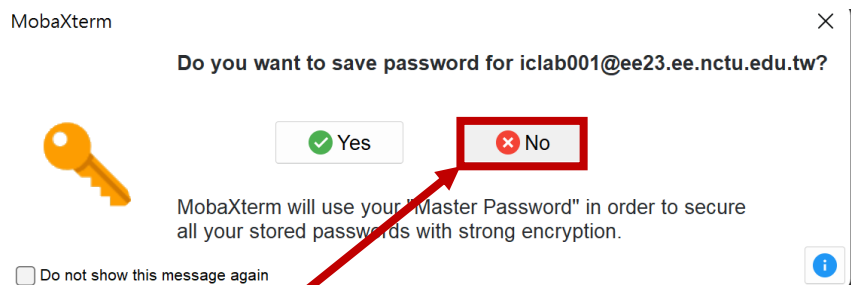
使用MobaXterm登入工作站 Connect to server with MobaXterm

The screenshot illustrates the MobaXterm interface with several steps highlighted for connecting to a server:

- (1)** The **Session** icon in the left sidebar is highlighted with a red box.
- (2)** The **SSH** icon in the top toolbar is highlighted with a red box.
- (3)** The **Basic SSH settings** tab is active, and the following fields are highlighted with a red box:
 - Remote host ***: ee23.ee.nctu.edu.tw (labeled **Server IP** with a red arrow)
 - Specify username**: iclab001 (labeled **Student Account** with a red arrow)
 - Port**: 415 (labeled **Port 415** with a red arrow)
- (4)** The **OK** button at the bottom is highlighted with a red box.
- (5)** The text **Type your password** is shown with a red arrow pointing to the password prompt in the terminal window.

The terminal window at the bottom displays the prompt: `iclab001@ee23.ee.nctu.edu.tw's password:`

使用MobaXterm登入工作站 Connect to server with MobaXterm



(1) 為安全請選No

For safety "No"

(2) 確認伺服器狀態

Check server information

(3) 輸入 "yes"，將自動設置EDA環境

Type "yes" to source environment

```
• MobaXterm Personal Edition v22.1 •
(SSH client, X server and network tools)

> SSH session to iclab001@ee23.ee.nctu.edu.tw
• Direct SSH : ✓
• SSH compression : ✓
• SSH-browser : ✓
• X11-forwarding : ✓ (remote display is forwarded through SSH)

> For more info, ctrl+click on help or visit our website.

Activate the web console with: systemctl enable --now cockpit.socket

Last login: Fri Sep 9 02:32:06 2022 from 140.113.125.107
=====
| Welcome to ED415 Server System |
=====

Check all server status:
'scheck' command
Hostname: :
ee23
CPU Model: :
12thGenIntel(R)Core(TM)i7-12700
Operating System:
CentOS Stream release 8
Memory Size:
62Gi
Server Manager:
Lin-Hung Lai (lh lai@ieee.org)
Eugene Lee (eugene@ieee.org)
Report Problem:
https://forms.gle/FNmZmyMdSb4XoU7fA
=====

>>> Are you sure to login? (type 'yes' to start)
=====
> yes
```

伺服器有問題可填表單回報
例如某個EDA Tool不能跑

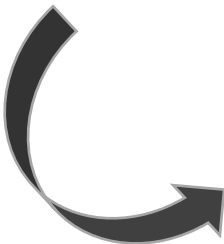
Any problem related to server
can be reported by this form

使用MobaXterm登入工作站 Connect to server with MobaXterm

列出全部可用EDA軟體

All the EDA tool would be listed

```
=====  
>>> Are you sure to login? (type 'yes' to start)  
=====  
> yes
```



成功登入進入此畫面

Successful login enter this

```
=====  
CAD tools available on this machine (2022.03.13 updated)  
=====  
| Cell-Based Design |           Synopsys           |           Cadence           |  
|-----|-----|-----|  
| Simulation        | VCS_2020.12(vcs)             | XCELIUM_20.09(xrun)         |  
|                   | VERDI_2020.12(nWave)         | INCISIV_15.20(irun)         |  
| Synthesis         | DC_2020.09(dc_shell)         | GENUS_20.10(genus)         |  
| Physical Design   | ICC2_2020.09(icc2_shell)     | INNOVUS_20.15(innovus)     |  
| STA / Power       | PT_2019.03(pt_shell)        | JG_2021.03(jg)             |  
| Formal            |                               |                               |  
|-----|-----|-----|  
| Full-Custom Design |           Synopsys           |           Cadence           |  
|-----|-----|-----|  
| Simulation        | HSP_2020.03(hspice)          |                               |  
|                   | CEX_2020.12(cx,wv)           |                               |  
| Layout            | LAKER_2021.03(laker)         | IC_06.17(virtuoso)         |  
|-----|-----|-----|  
| Others            | Siemens Calibre              |                               |  
|                   | Synopsys MetaWare Development Toolkit |                               |  
|                   | Synopsys Tetra Max           |                               |  
|                   | Python3.6                    |                               |  
|-----|-----|-----|  
| License Server    | 1717@lshc:5280@lshc:26585@lshc |                               |  
|-----|-----|-----|  
| Useful Command:   |                               |                               |  
| 1. quota -us [username] → check out your quota |                               |  
| 2. passwd          → change your password |                               |  
| 3. htop            → check out server usage |                               |  
| 4. scheck          → check available server usage |                               |  
|-----|-----|-----|  
[iclab001@ee23 ~]$
```



使用MobaXterm登入工作站 Connect to server with MobaXterm

(2) 選擇最適合的伺服器連線

Choose server with the following priority:

- Newer CPU or Less CPU usage(%)
- Less memory usage(%)
- Larger memory
- Less users

linux09	linux11	linux12	linux13	linux14	linux15
Users: 0	Users: 0	Users: 0	Users: 0	Users: 0	Users: 0
CPU : 0.0%	CPU : 0.0%	CPU : 0.0%	CPU : 0.0%	CPU : 3.8%	CPU : 0.0%
Mem : 1.6%	Mem : 1.7%	Mem : 4.1%	Mem : 3.4%	Mem : 12.8%	Mem : 3.4%
MUsed: 361M	MUsed: 398M	MUsed: 315M	MUsed: 262M	MUsed: 958M	MUsed: 262M
MFree: 22G	MFree: 22G	MFree: 7.3G	MFree: 7.4G	MFree: 6.3G	MFree: 7.4G

linux16	linux17	linux18	linux19	linux20	linux21
Users: 0	Users: 0	Users: 0	Users: 0	Users: 0	Users: 0
CPU : 0.0%	CPU : 0.1%	CPU : 0.0%	CPU : 0.0%	CPU : 0.0%	CPU : 0.1%
Mem : 3.5%	Mem : 3.5%	Mem : 3.5%	Mem : 3.9%	Mem : 1.6%	Mem : 2.8%
MUsed: 263M	MUsed: 263M	MUsed: 264M	MUsed: 294M	MUsed: 362M	MUsed: 640M
MFree: 7.4G	MFree: 7.4G	MFree: 7.4G	MFree: 7.3G	MFree: 22G	MFree: 22G

linux22	linux23	linux24	linux25	linux26	linux27
Users: 0	Users: 0	Users: 0	Users: 0	Users: 0	Users: 0
CPU : 3.9%	CPU : 0.0%	CPU : 0.0%	CPU : 0.0%	CPU : 0.0%	CPU : 0.0%
Mem : 3.0%	Mem : 1.6%	Mem : 1.7%	Mem : 3.5%	Mem : 1.7%	Mem : 1.6%
MUsed: 700M	MUsed: 364M	MUsed: 399M	MUsed: 264M	MUsed: 399M	MUsed: 366M
MFree: 21G	MFree: 22G	MFree: 22G	MFree: 7.3G	MFree: 22G	MFree: 22G

linux28	linux29	linux30
Users: 0	Users: 0	Users: 0
CPU : 0.0%	CPU : 0.0%	CPU : 0.1%
Mem : 1.6%	Mem : 1.5%	Mem : 1.8%
MUsed: 363M	MUsed: 334M	MUsed: 414M
MFree: 22G	MFree: 23G	MFree: 22G

----- 415 Server Monitor Board -----		
Last updated: 09/09/2022--02:33:03		
Color	Recommend	Avai Number
Green	*****	49
Blue	****	2
Yellow	***	0
Red	**	0
White		0

[iclab001@eee23 ~]# scheck

(1) 輸入“scheck”，查看可用伺服器資訊

Type “scheck” to check all available servers



使用MobaXterm登入工作站 Connect to server with MobaXterm

```
-----
| CAD tools available on this machine (2022.03.13 updated) |
|-----|-----|-----|
| Cell-Based Design |           Synopsys           |           Cadence           |
|-----|-----|-----|
| Simulation         | VCS_2020.12(vcs)             | XCELIUM_20.09(xrun)         |
|                   | VERDI_2020.12(nWave)         | INCISIV_15.20(iron)         |
| Synthesis          | DC_2020.09(dc_shell)         | GENUS_20.10(genus)          |
| Physical Design    | ICC2_2020.09(icc2_shell)     | INNOVUS_20.15(innovus)     |
| STA / Power        | PT_2019.03(pt_shell)         |                             |
| Formal             |                             | JG_2021.03(jg)              |
|-----|-----|-----|
| Full-Custom Design |           Synopsys           |           Cadence           |
|-----|-----|-----|
| Simulation         | HSP_2020.03(hspice)          |                             |
|                   | CEX_2020.12(cx,wv)           |                             |
| Layout             | LAKER_2021.03(laker)         | IC_06.17(virtuoso)          |
|-----|-----|-----|
| Others             | Siemens Calibre              |                             |
|                   | Synopsys MetaWare Development Toolkit |                             |
|                   | Synopsys Tetra Max           |                             |
|                   | Python3.6                    |                             |
|-----|-----|-----|
| License Server     | 1717@lshc:5280@lshc:26585@lshc |
|-----|-----|-----|
| Useful Command:    |
| 1. quota -us [username] --> check out your quota |
| 2. passwd           --> change your password   |
| 3. htop             --> check out server usage  |
| 4. scheck           --> check available server usage |
|-----|-----|-----|
[vlsi001@ee02 ~]$ passwd
Changing NIS account information for vlsi001 on raid.
Please enter old password:
Changing NIS password for vlsi001 on raid.
Please enter new password:
The password must have at least 6 characters.
Please enter new password:
The password must have both upper and lowercase letters, or non letters.
Please enter new password:
Please retype new password:

The NIS password has been changed on raid.
[vlsi001@ee02 ~]$
```

(1) 首次登入 輸入"passwd" 更改密碼

Type "passwd" to change password when first login

(2) 輸入舊密碼(預設密碼)

Type old password(default)

(3) 輸入新密碼

Type new password

(4) 再次輸入新密碼

Retype new password

(5) 更改成功

Successful change

規則: 至少6位密碼
須包含大小寫



工作站連線資訊 *MacOS / Linux*

1.如果您使用的是 MacOS / Linux，您可以打開終端應用程式(terminal)，然後輸入命令

```
$ ssh -p 415 -X [username]@[host]
```

例如 `$ ssh -p 415 -X iclab001@ee21.ee.nctu.edu.tw`

2.如果這是你第一次連接到機器，你會被要求確認身份，輸入"yes"；

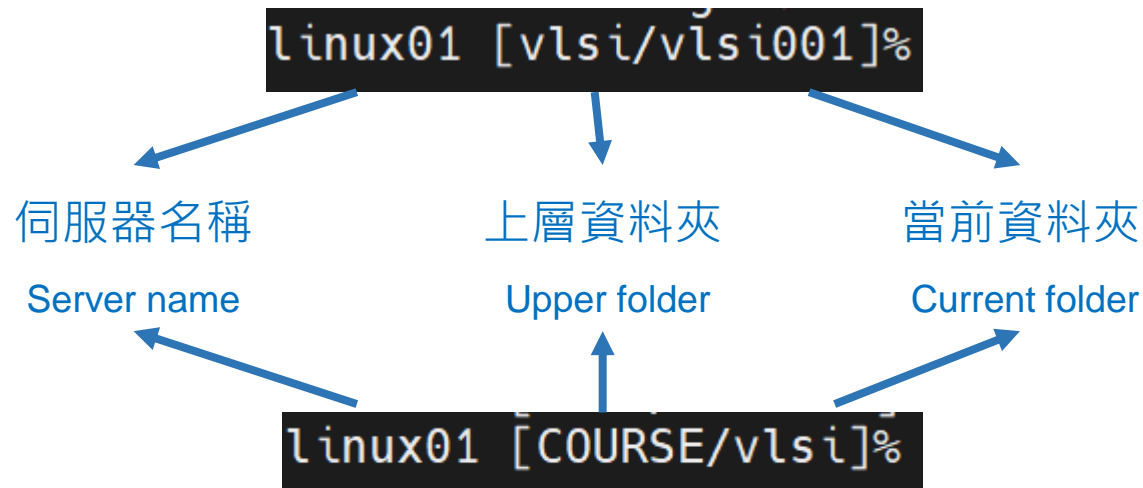
3.然後系統會提示您輸入密碼。輸入密碼後，您將通過 SSH 連接到服務器。

4.輸入 `passwd` 更改密碼 (超級重要!!)

辨別家目錄與當前所在路徑 Identify current path and home directory

- 家目錄 Home Directory

- ❑ 此工作站為修課工作站，本課程的資料夾名稱為vlsi
- ❑ 每個帳號都有專屬的資料夾 vlsi001~vlsi100 為該帳號之家目錄
- ❑ 任一帳號僅對其家目錄有所有權限
- ❑ 課程資料路徑: /RAID2/COURSE/vlsi/vlsi{001~100}
- ❑ 可以用 ~ 表示家目錄 例如: ~/test = /RAID2/COURSE/vlsi/vlsi001/test



基本指令介紹 Basic linux command

- **pwd** → 顯示當層資料夾完整路徑 Show current folder full path
- **ls** → 列出當前資料夾底下項目 Show items in current folder
 - **ls -a**: list all files include shaded files , **ls -l**: show detail information
- **mkdir** → 建立新資料夾 Create a new folder
- **cd** → 進入/退出資料夾 Enter a folder or leave a folder
 - **cd ..** go to upper folder, **cd -** go to previous folder, **cd ~** go to home directory
- **cp** → 複製檔案/資料夾 Copy file or folder
 - **cp -r [folder name]** , -r represent recursive (複製資料夾要加-r)
- **rm** → 刪除檔案/資料夾 Remove file or folder
 - **rm -rf [folder name]** , -r represent recursive (刪除資料夾要加-r , 記得資料刪除就真的刪除 , 助教也救不回來)
- **Ctrl + C** → 中斷指令 Interrupts command (打錯指令或是當機可輸入中斷指令終止程式執行)



基本指令介紹 Basic linux command

- **passwd**
- **man command** //format and display the on-line manual pages
 - e.g. man cd
- **mkdir directory** //make directory
 - e.g. mkdir ~/LAB/Lab1/Exercise //~ = user's home
- **cd destination** //change directory
 - e.g. cd ../vlsi08/Lab1/ //.. = parent directory
- **cp source destination** //copy files
 - e.g. cp -r Lab1/ Lab2/ //-r = recursively copy without asking
- **mv source destination** //move or rename files
 - e.g. mv Lab1.v ../ //move
 - e.g. mv Lab1.v Lab2.v //rename

基本指令介紹 Basic linux command

- **ls** **//list** directory contents
 - e.g. `ls -la` **//-la** = long format and show all files
- **rm** **file** **//remove** (delete) files
 - e.g. `rm ABC.v`
 - e.g. `rm -rf Lab1/`
- **tar** **option** **file**
 - e.g. `tar -xvf Lab1.tar` **//extract** the tarball and shows information
 - e.g. `tar -cvf Lab1.tar Lab1` **//make** a tarball
- **top** **//show** all users in current workstation
- **jobs** **//show** all background process with labeled number
- **kill** **//kill** process

基本指令介紹 Basic linux command

更多指令可參考來源資料 (<https://ithelp.ithome.com.tw/articles/10235530>)

exit	離開	<code>exit</code>
pwd	取得目前的路徑	<code>pwd</code>
ls	取得當前資料夾與檔案名稱	<code>ls</code>
cd	切換目錄	<code>cd ~</code>
touch	建立檔案	<code>touch demo.html</code>
mkdir	建立資料夾	<code>mkdir demo</code>
rm	刪除檔案	<code>rm demo.html</code>
cp	複製檔案	<code>cp demo.html demo1.html</code>
scp	在不同的 Linux 主機之間複製檔案	<code>scp user_name@riverye.com:/home/data/考試100分.pdf ~/Desktop</code>

mv	移動檔案	<code>mv demo1.html ~</code>
sudo	使用最高權限	<code>sudo</code> 欲使用的指令
man	查看指令說明文件	<code>man pwd</code>
help	查看指令說明	<code>mv --help</code>
clear	清除終端機上的訊息 (往上捲看得到)	<code>clear</code>
which	查詢指令的來源路徑	<code>which sudo</code>
find	找出符合條件的檔案或資料夾	<code>find .</code>

Outline

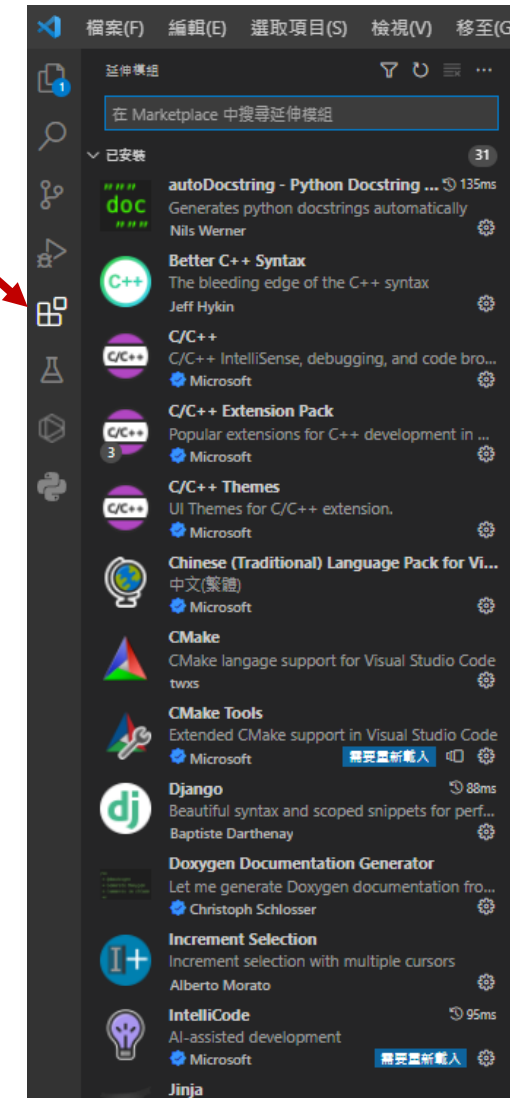
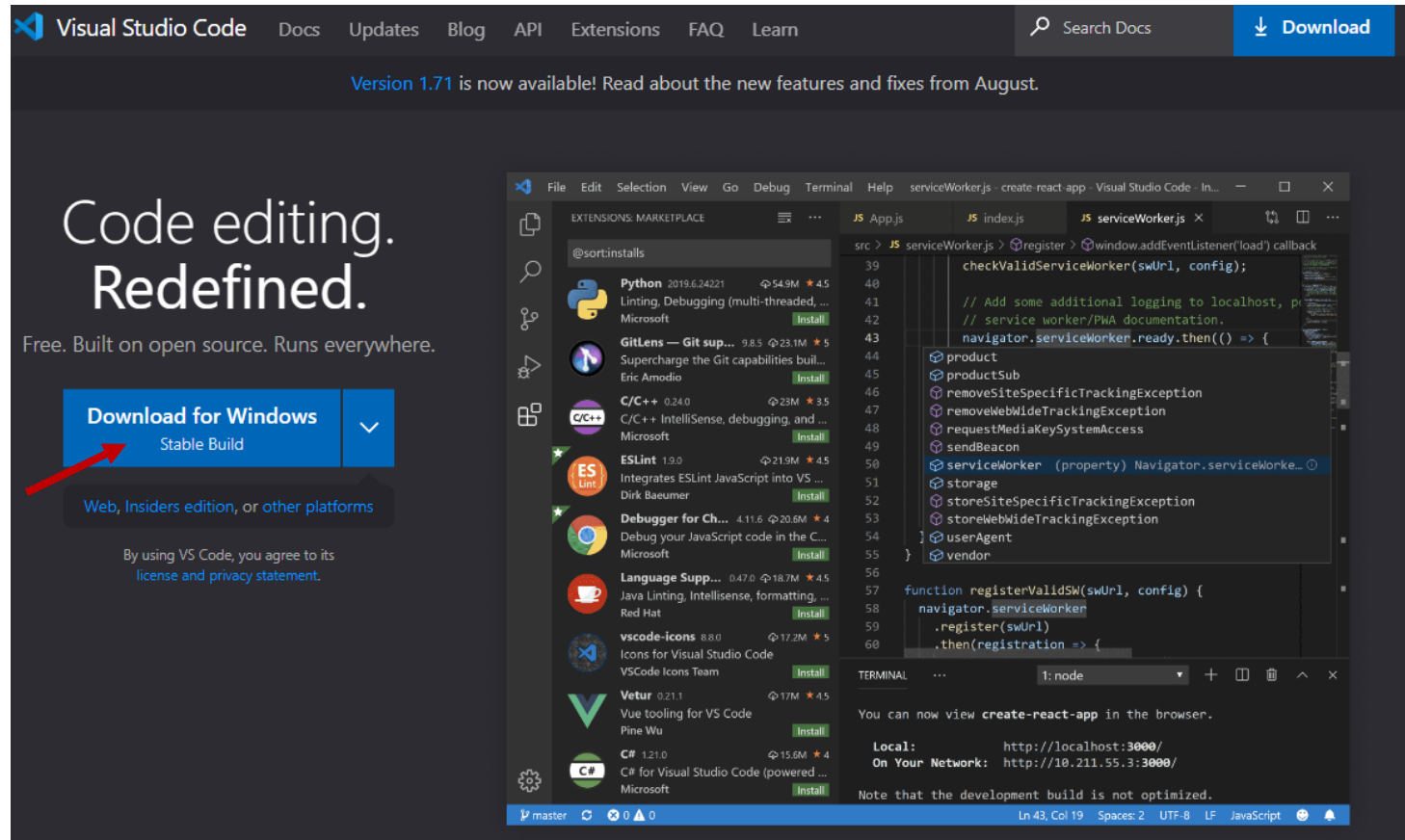
- 415 Server SSH Connection
- Connect to Server: MobaXterm
- **Text Editor: VScode**
- FTP Data Upload/Download

文字編輯器 Text Editor

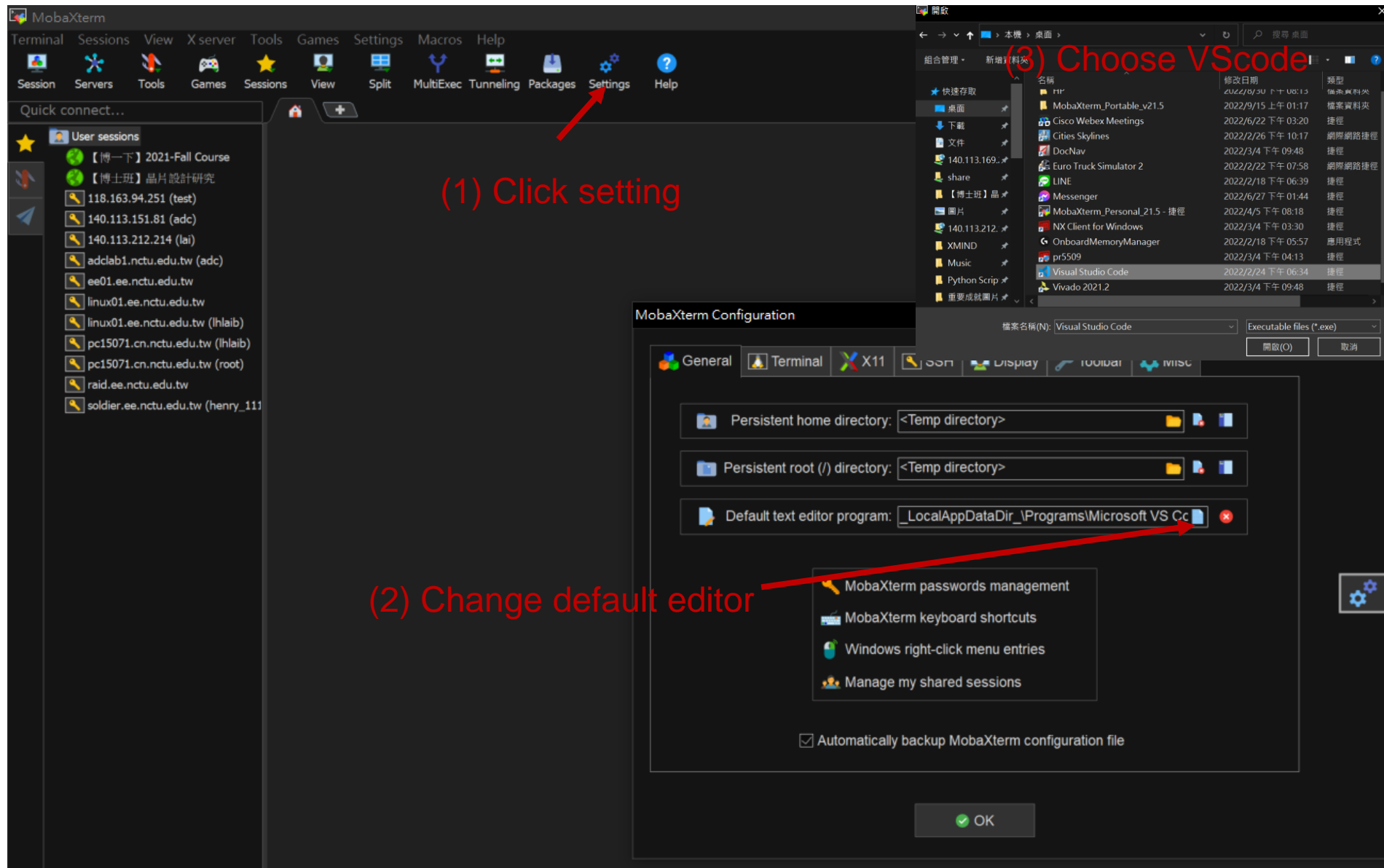
VScode

<https://code.visualstudio.com/>

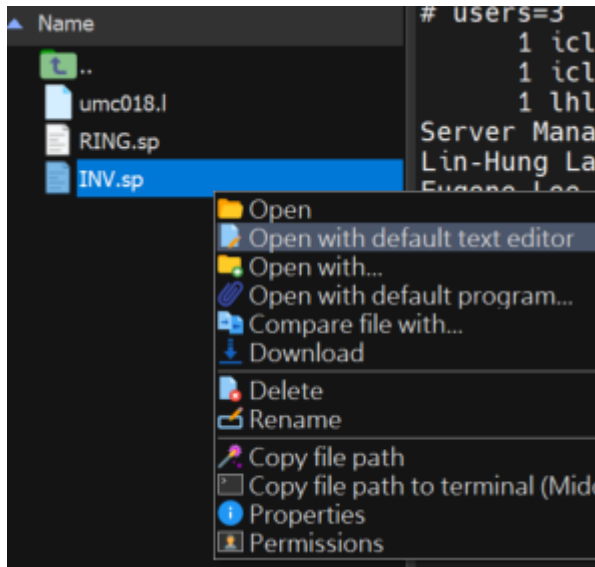
Click extension
Download needed extension
As your prefer



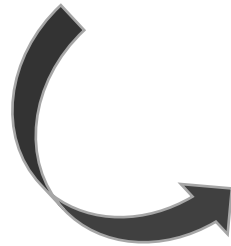
文字編輯器 Text Editor



文字編輯器 Text Editor



Open with default editor

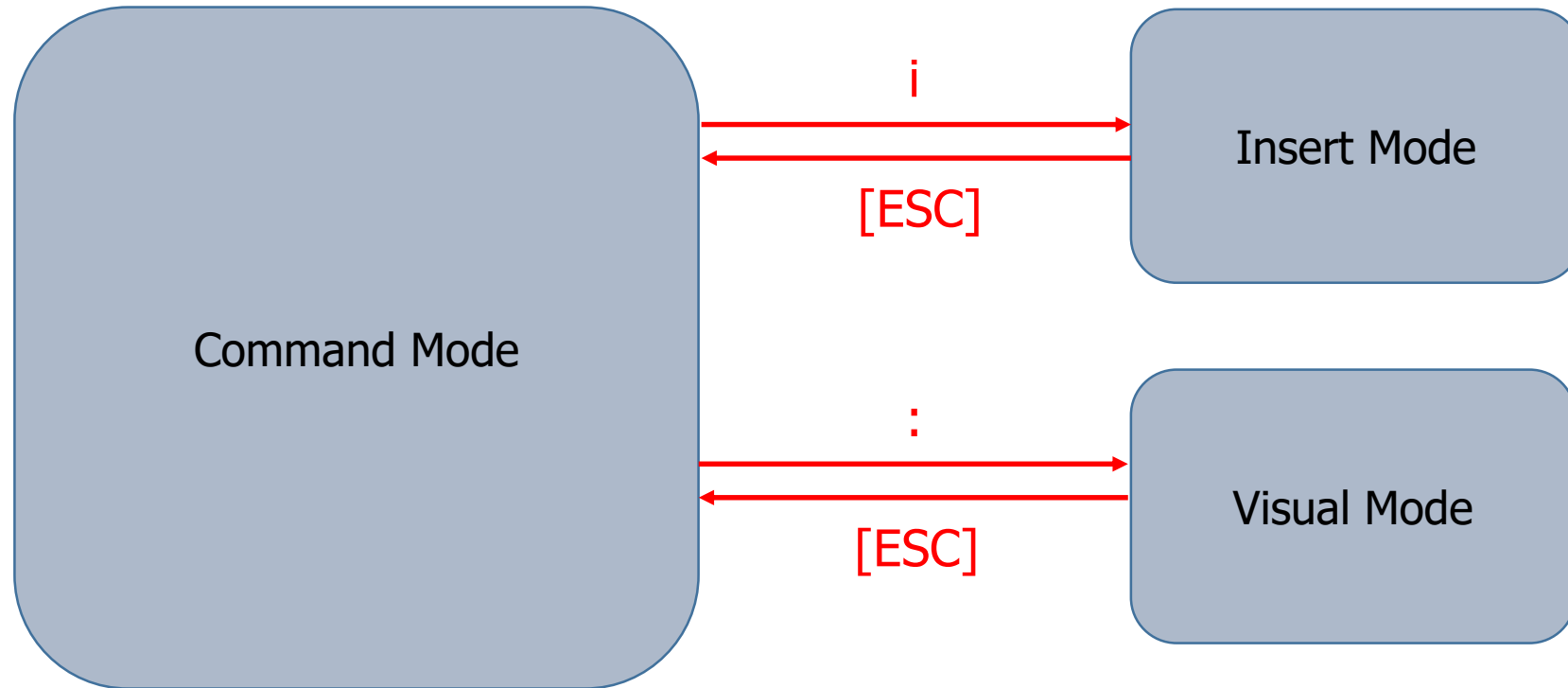
A screenshot of a text editor window with a dark theme. The file 'INV.sp' is open. The editor shows a Verilog HDL code snippet for a CMOS inverter. The code includes comments, a title, settings, library references, and parameter declarations. The line numbers 1 through 25 are visible on the left side of the code area.

```
1  ***-----***
2  ***      VLSI 2021 Lab1      ***
3  ***      CMOS inverter      ***
4  ***      Example            ***
5  ***-----***
6  .title vlsi lab1_inv
7
8  ***-----***
9  ***      setting            ***
10 ***-----***
11 .lib "umc018.1" L18U18V_TT
12 .TEMP 25
13 .op
14 .options post
15
16 ***-----***
17 ***      parameters          ***
18 ***-----***
19 .global VDD GND
20 .param supply=1.8v
21 .param load=0.1f
22
23 .param wp=0.24u
24 .param wn=0.24u
25
```

文字編輯器 VIM Text Editor VIM

✓ **>vi filename** //create a file

- e.g. vi test.v
- e.g. vim test.v



✓ Command mode

— Move cursor:

- [Page Down], [Page Up]
- [Home], [End]
- $\uparrow(k)\downarrow(j)\leftarrow(h)\rightarrow(l)$: move cursor
- G: cursor moves to last column
- nG: “n” is number. cursor moves to “n”th column
- gg: cursor moves to the first column. (=1G)
- n<Enter>: “n” is number. cursor moves down n columns.

— Search & Replace:

- /word: search for “word”
- n: search the next
- N: search the previous

- Delete & Copy & Paste:
 - [delete] or x: delete the character under the cursor.
 - X: delete the character before the cursor.
 - dd: delete a column where the cursor located at.
 - ndd: “n” is number. delete “n” columns.
 - yy: copy a column where the cursor located at.
 - nyy: “n” is number. copy “n” columns.
 - u: recover.
 - . : repeat the previous action.
 - [Shift]+v : select the column where the cursor located at.
 - [Ctrl]+v+[Shift]+I : edit multi-line.

✓ Insert mode:

- i : switch to insert mode before the current position.
- [Esc]: switch from the insert mode to the command mode

✓ Visual mode:

- :w : write the current buffer to disk.
- :q : closes current window.
- :wq : write the current buffer to disk and closes current window.
- :q! : closes current window forcibly.
- :set nu : display the column number.

更多說明請參考網站 More info please refer the website

1. 連線方法 SSH / XRDP

<https://www.lhlaib.com/ed415/tutorial>

2. 硬體規格 Hardware

<https://www.lhlaib.com/ed415/hardware>

3. 軟體清單 Software

<https://www.lhlaib.com/ed415/tools>

4. 使用規範 Rules

<https://www.lhlaib.com/ed415/rules>

5. 實用技巧 Tips

<https://www.lhlaib.com/ed415/tips>

6. Linux 常用指令總整理

<https://www.lhlaib.com/ed415/linux-tutorial>

