



# *Digital System Design*

## **Workstation Tutorial**

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**Speaker: Ben**



## 2025 教育部 IC Design Contest

- ❖ 鼓勵大學校院學生從事積體電路設計，培養實際設計能力，以增進學生學習興趣，提升我國積體電路設計水準
- ❖ **Before 2/28 (Fri.)**

**報名期限** - 2025/2/3 - 2/28

**初賽日期** - 2025/3/26 8:30-20:30

場地:各校實驗室/研究室

**決賽日期** - 2025/5/7 - 5/9

場地:國研院台灣半導體研究中心





## Outline

- ❖ Account application form
- ❖ Connect to workstation
- ❖ Basic commands in Unix/Linux
- ❖ Text editors



## Outline

- ❖ **Account application form**
- ❖ **Connect to workstation**
  - ❖ MobaXterm (Windows)
  - ❖ Xquartz (Mac)
- ❖ **Basic commands in Unix/Linux**
- ❖ **Text editors**



## Workstation Application Form

❖ <https://forms.gle/cWqC4JqcnZgXvVqV6>

### IC設計實驗室伺服器帳號申請表

實驗室規則：

1. 請勿任意 reboot 主機，破壞系統或做出對系統有害之行為，或將帳號借予他人使用，否則若經查獲，立即刪除帳號，並交與教授處理。
2. 硬碟使用空間以大學部 1G、碩士班 5G、博士班 10G 為限。
3. 個人資料請自行備份，並於畢業時將個人目錄下的檔案清理乾淨。
4. 帳號預設期限為一學年，每年9/1將停止上學年申請之帳號，新的
5. 其它注意事項請參閱本實驗室內之實驗室公布欄與實驗室網頁 [ht](#)
6. 本伺服器帳號需使用"校內IP"登入, 如果是校外IP, 請參考 <https://c>

校內生請填此網路表單  
非校內生請填紙本





## LAB 231 Workstation IP List

❖ <http://cad.ee.ntu.edu.tw>

❖ Connect: ssh <user name>@<Name>.ee.ntu.edu.tw

* IP	Name	Type	CPU	CPU Clock	Memory	OS
140.112.20.59	cad16	IBM X3500	Intel Xeon 64	1.2 GHz * 24	40 GB	CentOS 6.10
140.112.20.60	cad17	IBM x260	Intel Xeon 64	1.2 GHz * 24	32 GB	CentOS 6.10
--	cad20	--	--	--	--	--
140.112.20.64	cad21	DELL R620	Intel Xeon 64	2 GHz * 32	48 GB	CentOS 6.9
140.112.20.70	cad27	DELL R640	Intel Xeon Silver 4110	2.1 GHz * 32	128 GB	CentOS 6.10
140.112.20.72	cad29	Dell R730	Intel Xeon 64	2.3GHz * 40	336 GB	CentOS 6.10
140.112.20.73	cad30	--	Intel Xeon 64	1.6GHz * 16	12 GB	CentOS 6.9
140.112.20.74	cad31	DELL R620	Intel Xeon 64	2.2 GHz * 32	48 GB	CentOS 6.9
140.112.20.76	cad33	--	--	--	--	--
140.112.20.77	cad34	IBM X3650	Intel Xeon 64	1.6 GHz * 16	16 GB	CentOS 6.9
140.112.20.81	cad38	IBM X3650	Intel Xeon 64	2.4 GHz * 16	96 GB	RHEL 5
140.112.20.82	cad39	IBM X3650	Intel Xeon 64	1.2 GHz * 24	40 GB	CentOS 6.9
140.112.20.83	cad40	IBM X3550	Intel Xeon 64	2 GHz * 24	132 GB	CentOS 6.9



## Outline

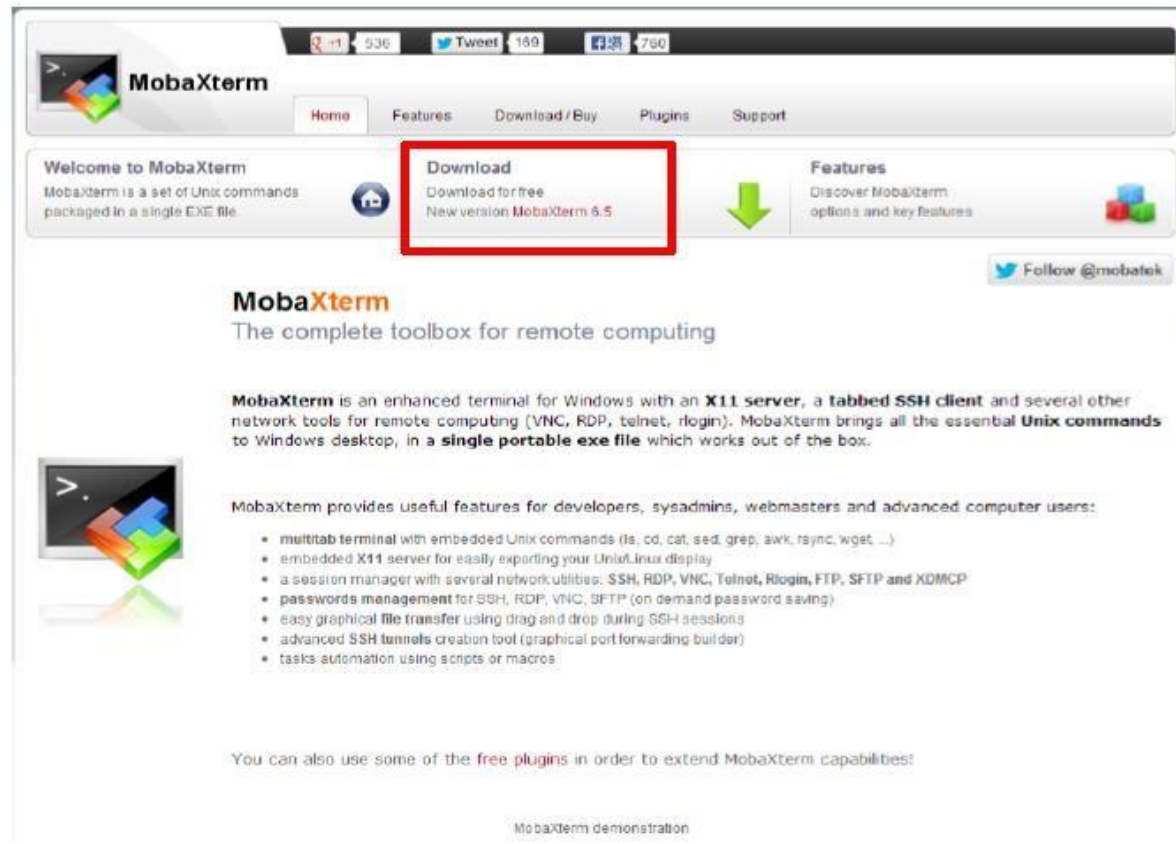
- ❖ Account application form
- ❖ **Connect to workstation**
  - ❖ MobaXterm (Windows)
  - ❖ Xquartz (Mac)
- ❖ Basic commands in Unix/Linux
- ❖ Text editors



# MobaXterm (Windows) (1/2)

❖ Download:

❖ <http://mobaxterm.mobatek.net/>



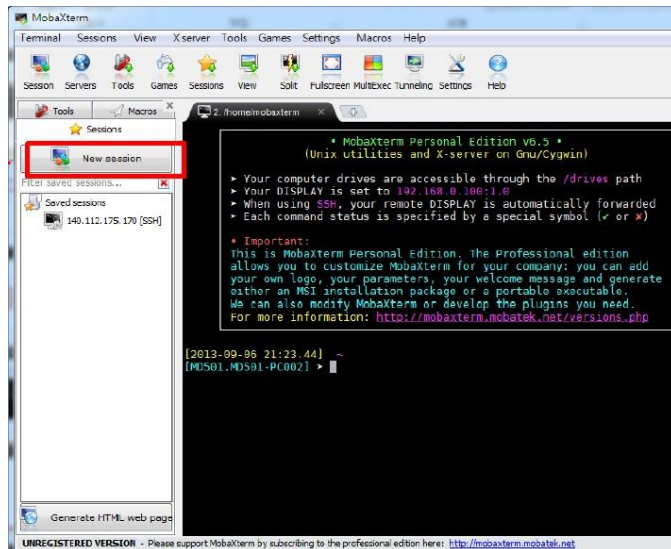




## MobaXterm (Windows) (2/2)

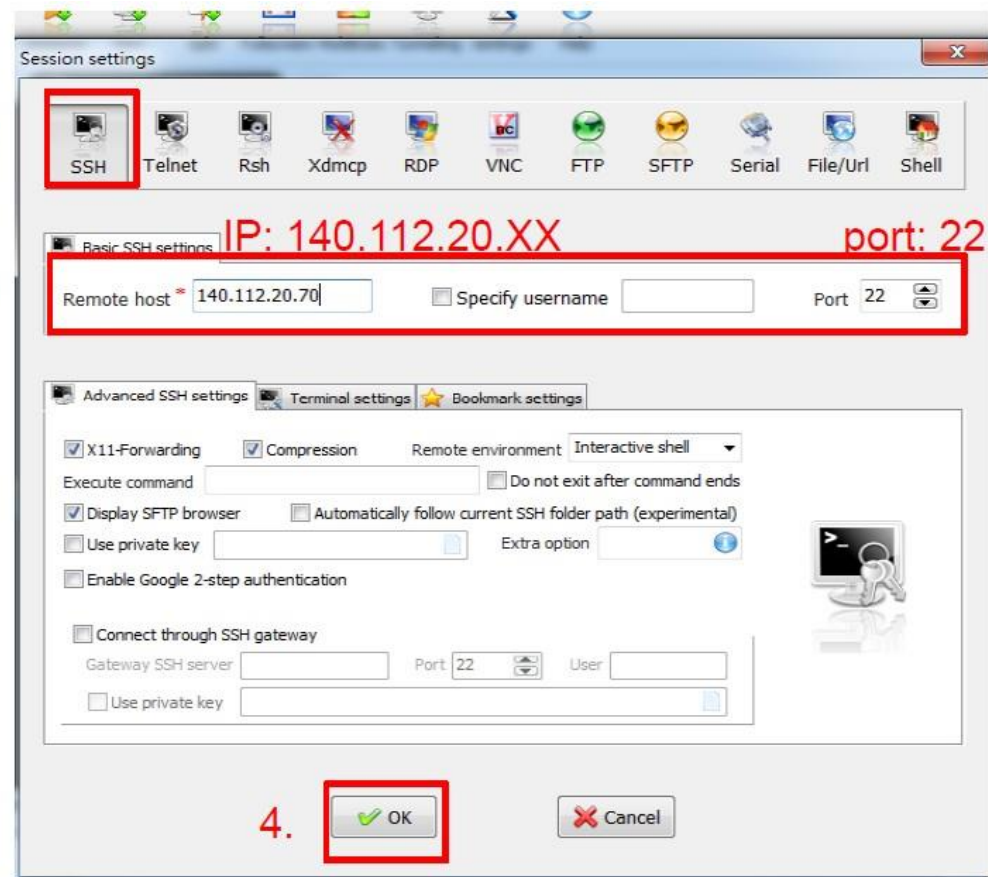
❖ MobaXterm = SFTP + SSH + X-server

❖ New Session



2.

3.



4.

❖ Or directly enter command to connect

❖ ssh b04XXX@140.112.20.70



## Xquartz (Mac)

- ❖ 請下載XQuartz，下載安裝後登出系統並重新登入，在terminal輸入ssh -Y 你的帳號@140.112.20.\*，即可使用
- ❖ Ref: <https://uisapp2.iu.edu/confluence-prd/pages/viewpage.action?pageId=280461906>



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- ❖ **Basic commands in Unix/Linux**
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## Environment

The screenshot shows the MobaXterm window with the following content:

**MobaXterm**  
Terminal Sessions View Xserver Tools Games Settings Macros Help

Session Servers Tools Games Sessions View Split Fullscreen MultiExec Tunneling Settings Help

1.r01013@140.112.175: X

```

• MobaXterm Personal Edition v6.5 •
(Unix utilities and X-server on Gnu/Cygwin)

> Your computer drives are accessible through the /drives path
> Your DISPLAY is set to 192.168.0.100:1.0
> When using SSH, your remote DISPLAY is automatically forwarded
> Each command status is specified by a special symbol (✓ or ✗)

• Important:
This is MobaXterm Personal Edition. The Professional edition
allows you to customize MobaXterm for your company: you can add
your own logo, your parameters, your welcome message and generate
either an MSI installation package or a portable executable.
We can also modify MobaXterm or develop the plugins you need.
For more information: http://mobaxterm.mobatek.net/versions.php

```

show side bar

```

[2013-09-06 21:42.48] ~
[MD501.MD501-PC002] > ssh r01013@140.112.175.171
Last login: Fri Sep  6 21:32:41 2013 from xdn175o169.ee.ntu.edu.tw
Platform = amd64
Platform = amd64
Platform = amd64
Platform = LINUX
#####
#      32BIT is the default mode      #
#      If you want to run 64BIT mode,  #
#      please set the LD_LIBRARY_PATH  #
#      to path of 64BIT by yourself.   #
#####
[r01013@localhost ~]$ ls
ADSD      PARTI_ALL  c          default.svf  libManager.log  novas_dump.log  testing_pattern
CDS.log   a          clogseMXt5  filenames.log  nWaveLog        prog.m
CVSDhw    ad_icd     command.log  filenames_8553_D20121217.log  ncverilog.log  senior_lab
INCA libs  b          d.v         gcc2012cb    novas.rc        synopsys_cache_0-2010.03-SP5
[r01013@localhost ~]$

```

UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <http://mobaxterm.mobatek.net>



## Basic Commands (1/5)

### ❖ Files

- ❖ **ls** : lists files
- ❖ **ls -l** : lists files in long format
- ❖ **ls -a** : lists all files, including the ones whose filename beginning in a dot
  
- ❖ **cp *src-filename dest-filename*** : copy files
- ❖ **mv *src-filename dest-filename*** : move files
- ❖ **rm filename** : delete the file
- ❖ **more filename** : show the content of the file



## Basic Commands (2/5)

### ❖ Directories

- ❖ **mkdir *dirname*** : make a new directory
- ❖ **cd *dirname*** : change directory
- ❖ **cd ..** : go up on directory level from here
- ❖ **cd ~** : go to user's home directory
- ❖ **rm -rf *dirname*** : remove a directory



## Basic Commands (3/5)

### ❖ Compress and decompress files

#### ❖ Compress

- ***tar -cvf filename.tar filename***
- ***gzip \*.tar***
  - \* stand for all files whose filename extension are .tar

#### ❖ Decompress

- ***gzip -d filename.tar.gz***
- ***tar -xvf filename.tar***



## Basic Commands (4/5)

### ❖ Process

- ❖ **ctrl + c** : kill foreground process
- ❖ **ps** : report processes and their pid numbers
- ❖ **kill <pid>** : kill the process with the pid

### ❖ Logout

- ❖ **exit**

### ❖ More options about command

- ❖ **man command-name** : display on-line manual pages





## Basic Commands (5/5)

### ❖ Reference

#### ❖ Chinese

- [http://linux.vbird.org/linux\\_basic/redhat6.1/linux\\_06command.php](http://linux.vbird.org/linux_basic/redhat6.1/linux_06command.php)
- [http://boson4.phys.tku.edu.tw/UNIX/UnixCommand/index\\_basic.htm](http://boson4.phys.tku.edu.tw/UNIX/UnixCommand/index_basic.htm)
- <http://www.lib.cgu.edu.tw/instruction/basiccmd.html>
- <http://larc.ee.nthu.edu.tw/~lmdenq/Unix.htm#%A4E%A1B%BF%E9%A5X%A4J%C2%E0>

#### ❖ A6V

#### ❖ English

- <http://mally.stanford.edu/~sr/computing/basic-unix.html>
- <http://www.math.utah.edu/lab/unix/unix-commands.html>
- <http://www.computerhope.com/unix/overview.htm>



## Outline

- ❖ Account application form
- ❖ Connect to workstation
- ❖ Basic commands in Unix/Linux
- ❖ **Text editors**
  - ❖ Vim
  - ❖ VS Code



## Vim (1/4)

### ❖ Vim (Vi Improved)

- ❖ An extended version of the vi editor
- ❖ Additional features designed to be helpful in editing program source code
- ❖ Free and open source software



## Vim (2/4)

### ❖ Three major modes

#### ❖ Common mode (*c-mode*)

- All keystrokes are interpreted as commands

#### ❖ Insert mode (*i-mode*)

- Most keystrokes are inserted as text

#### ❖ Edit mode (*e-mode*)

- Open/new/save file and quit vim

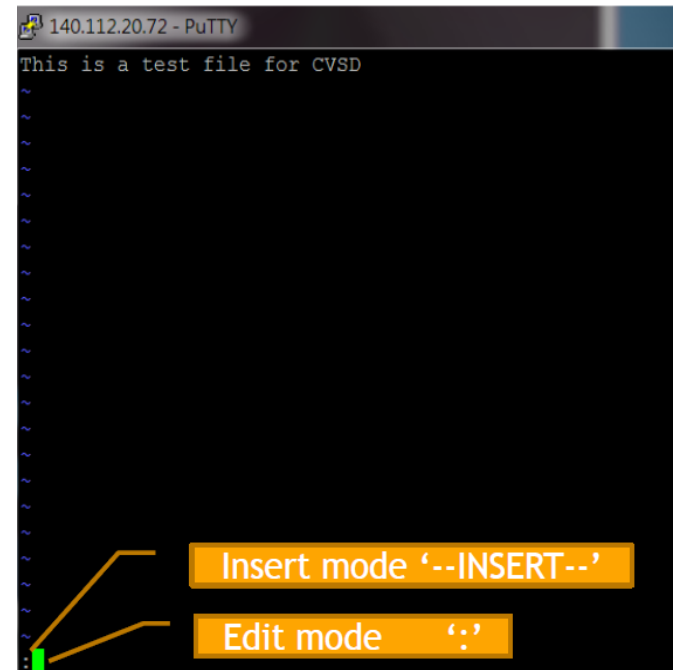
### ❖ Change modes

#### ❖ i-mode ← c-mode → e-mode

- ❖ Key: “i”      Key: “:”

#### ❖ i-mode → c-mode ← e-mode

- ❖ Key: “esc”    Key: “esc”





## Vim (3/4)

### ❖ Basic command in c-mode

- ❖ Key **dd** : delete the whole line
- ❖ Key **u** : undo
- ❖ Key **I** : enter insert-mode
- ❖ Key **:w + enter** : save a document
- ❖ Key **:q + enter** : quit without saving
- ❖ Key **:wq + enter** : save and quit at the same time
- ❖ Key **:q! + enter** : discard changes and quit
- ❖ Key **:w *new\_filename* + enter** : save as new-filename

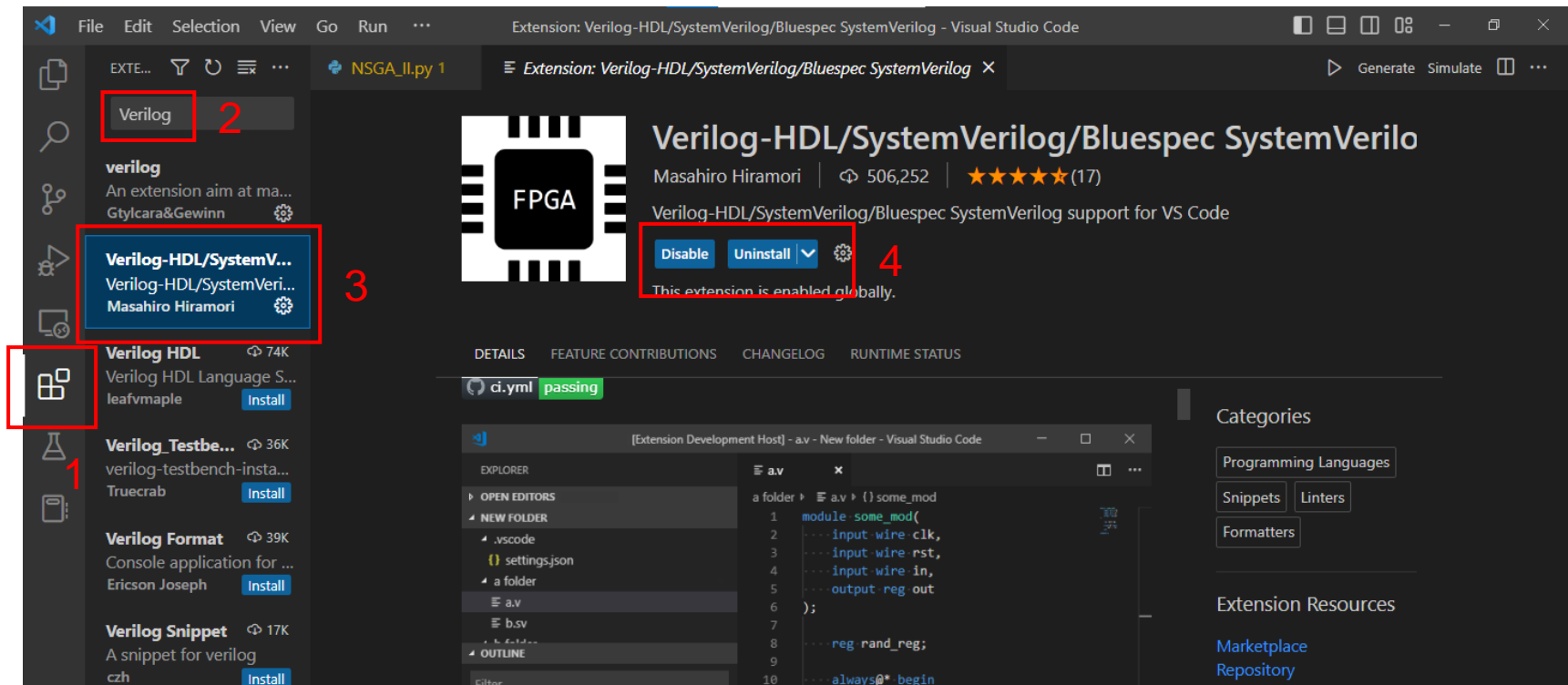
Created by vgod, Dec. 2009



## VS Code

❖ <https://code.visualstudio.com/>

❖ Easy to extend via packages





## (Optional) Copilot

❖ Free trial for student account

❖ <https://education.github.com/>

```
// write a binary search algorithm
const binarySearch = (arr, target) => {
  let left = 0;
  let right = arr.length - 1;
  let middle = Math.floor((left + right) / 2);
  while (arr[middle] !== target && left <= right) {
    if (target < arr[middle]) {
      right = middle - 1;
    } else {
      left = middle + 1;
    }
    middle = Math.floor((left + right) / 2);
  }
  return arr[middle] === target ? middle : -1;
}
```