



FreeBSD

wengyc

Outline

- ❑ FreeBSD version
 - 11.2-RELEASE
- ❑ Installing FreeBSD
 - From CD-ROM
 - From USB

A decorative graphic on the left side of the slide, consisting of several overlapping blue rectangular shapes of varying heights and widths, creating a stepped effect.

FreeBSD Version

FreeBSD Branches/Tags

❑ Three parallel development branches:

- *-RELEASE*
 - Latest Release Version:
 - 11.2 (June, 2018)
 - <http://www.freebsd.org/releases/>
 - Upcoming 12.0 (November, 2018)
 - <https://www.tw.freebsd.org/releases/12.0R/schedule.html>
- *-STABLE*
 - Tested new features and bug fixes
 - MFC: Merge From Current
- *-CURRENT*
 - Working space for FreeBSD developers
 - Current version:
 - 12.0-CURRENT
 - <http://www.freebsd.org/releng/>

FreeBSD Version

□ FreeBSD–A.B.C–Type

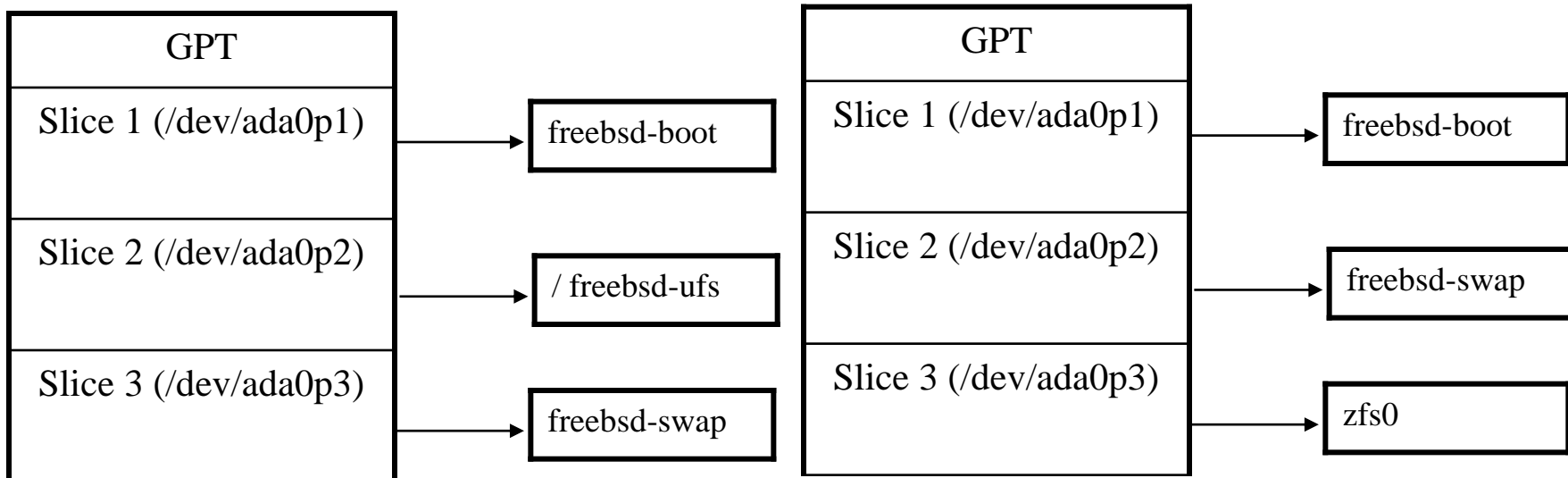
- A: major version Number
- B: minor version Number
- C: slight patch version number
- Type: version type
 - PRERELEASE
 - BETA
 - RC
 - RELEASE
 - STABLE
 - CURRENT

A decorative graphic on the left side of the slide, consisting of several overlapping blue rectangular shapes of varying shades and sizes, creating a layered effect.

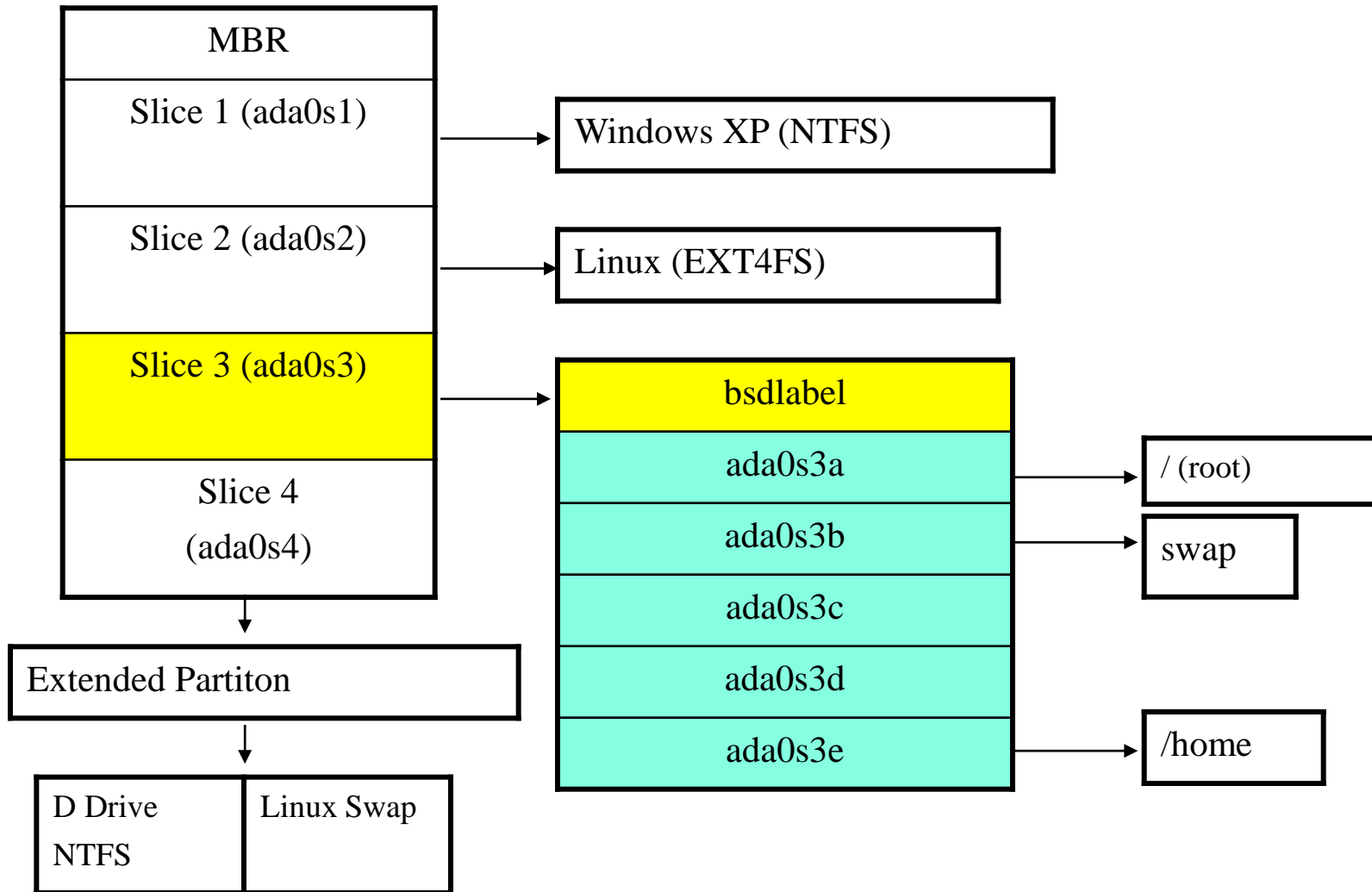
FreeBSD Installation

FreeBSD View of Disk (1)

- ❑ Guided partitioning layout between UFS and Root on ZFS



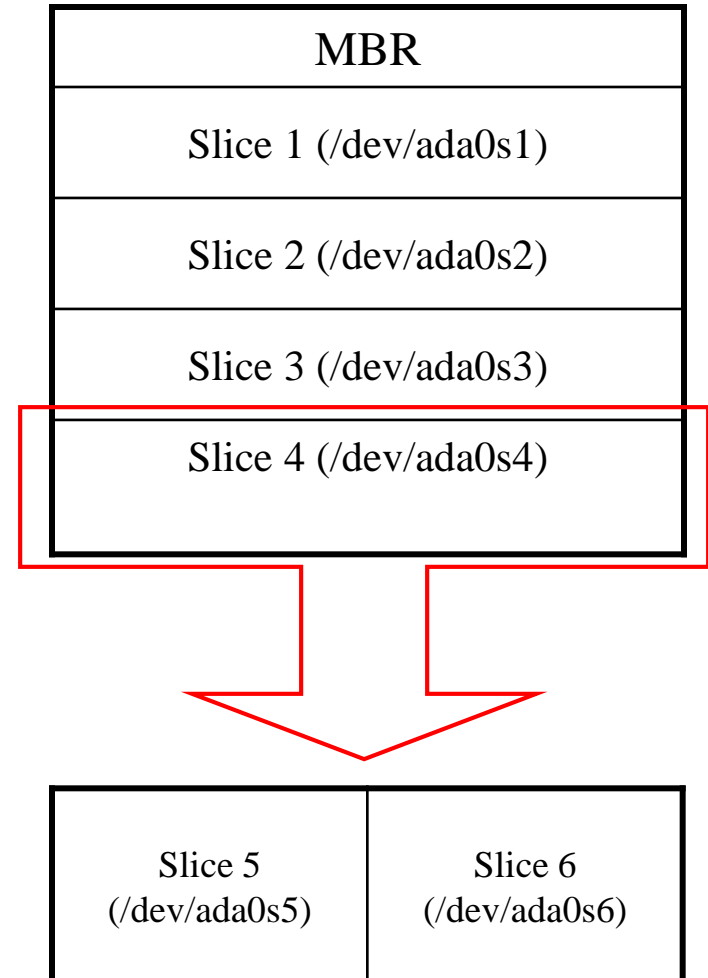
FreeBSD View of Disk (2)



FreeBSD View of Disk (3)

❑ What is the meaning of ada0s1a

- Disk name
 - ada : IDE, SATA
 - da: SCSI, usb stick
- Slice is equal to the partition of common use
 - Primary partition: s1 ~ s4
 - Extended partition: s5 ~ sn
- Label in each slice
 - a: root partition /
 - b: swap
 - c: entire slice
 - defgh: /usr, /home, ...



Knowing Your Hardware

- ❑ CPU
 - 32bit or 64bit
 - Intel 、AMD
 - Architecture: amd64, i386 (, ia64, pc98, powerpc, sparc64)
- ❑ RAM
 - Size
- ❑ HD
 - Size, amount, SCSI or IDE
- ❑ VGA
 - Brand, ram size
- ❑ Sound
 - Brand
- ❑ Network Interface Card
 - Brand
 - IP 、Netmask 、Default gateway 、Hostname 、DNS
- ❑ Other Special device
 - `pciconf -lv`

Pre-Installation Tasks

- One PC, Laptop
 - Another Hard Disk or Shrink a Partition on Your Hard Drive (20 GB)
- Or Virtual Machine
- Network Information
 - IP address
 - Subnet mask
 - Default router IP address
 - domain name of the local network
 - DNS server IP address(es)
- Prepare the Installation Media
 - <http://ftp.tw.freebsd.org/pub/FreeBSD/releases/>

bsdinstall – (1)

- ❑ An easy to use, text-based installation program
 - Beginning with FreeBSD 9.0-RELEASE



The image shows a terminal window with a black background. At the top, the word "FreeBSD" is displayed in a large, white, dashed font. Below it, the text "Welcome to FreeBSD" is centered. A white-bordered box contains a list of options: "1. Boot Multi User [Enter]", "2. Boot Single User", "3. Escape to loader prompt", "4. Reboot", "Options:", "5. Kernel: default/kernel (1 of 2)", and "6. Configure Boot Options...". Below the box, it says "Autoboot in 9 seconds. [Space] to pause". To the right of the box, there is a red, stylized graphic of a FreeBSD dragon.

```
FreeBSD

Welcome to FreeBSD

1. Boot Multi User [Enter]
2. Boot Single User
3. Escape to loader prompt
4. Reboot

Options:
5. Kernel: default/kernel (1 of 2)
6. Configure Boot Options...

Autoboot in 9 seconds. [Space] to pause
```

bsdinstall – (2)

- ❑ Install 、 Shell 、 Live CD

```
FreeBSD Installer
-----
                                     +-----+
                                     | Welcome |
                                     +-----+
                                     | Welcome to FreeBSD! Would you |
                                     | like to begin an installation |
                                     | or use the live CD?           |
                                     +-----+
                                     | <Install> <Shell> <Live CD> |
                                     +-----+
```

bsdinstall – (3)

❑ Select keymap

```
FreeBSD Installer
-----
                    Keymap Selection
-----
The system console driver for FreeBSD defaults to standard "US"
keyboard map. Other keymaps can be chosen below.
+-----+
|>>> Continue with default keymap
|->- Test default keymap
| ( ) Armenian phonetic layout
| ( ) Belarusian Codepage 1131
| ( ) Belarusian Codepage 1251
| ( ) Belarusian ISO-8859-5
| ( ) Belgian ISO-8859-1
| ( ) Belgian ISO-8859-1 (accent keys)
| ( ) Brazilian 275 Codepage 850
| ( ) Brazilian 275 ISO-8859-1
| ( ) Brazilian 275 ISO-8859-1 (accent keys)
| ( ) Bulgarian BDS
+-----+
|      v(+)|                                     11%
+-----+
|<Select>          <Cancel>
|-----[Press arrows, TAB or ENTER]-----|
+-----+
```

bsdinstall – (4)

❑ Setting hostname

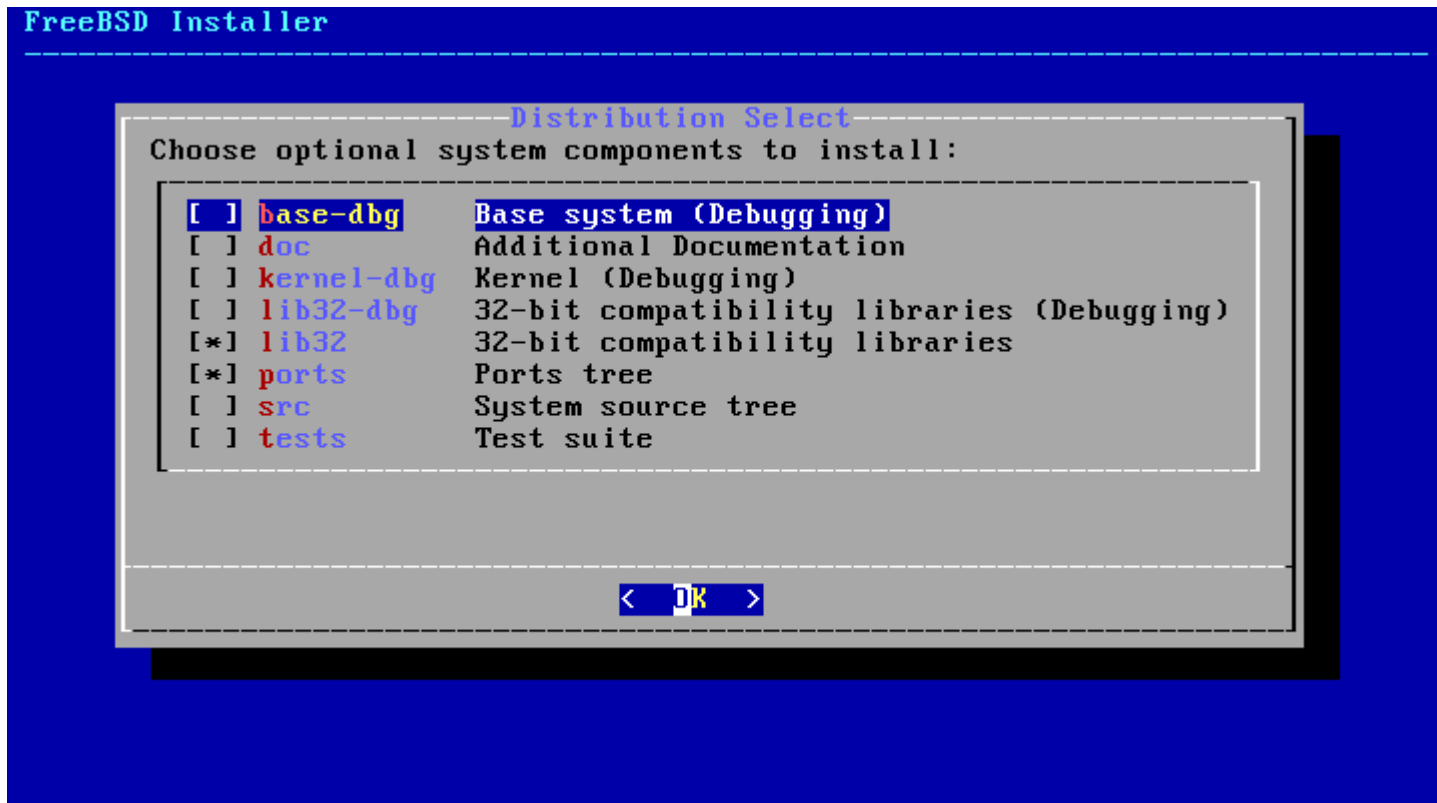
- e.g., xxxsa.cs.nctu.edu.tw

```
FreeBSD Installer
-----
                                Set Hostname
Please choose a hostname for this machine.

If you are running on a managed network, please
ask your network administrator for an appropriate
name.
+-----+
|machine3.example.com|
+-----+
                                < OK >
```

bsdinstall – (5)

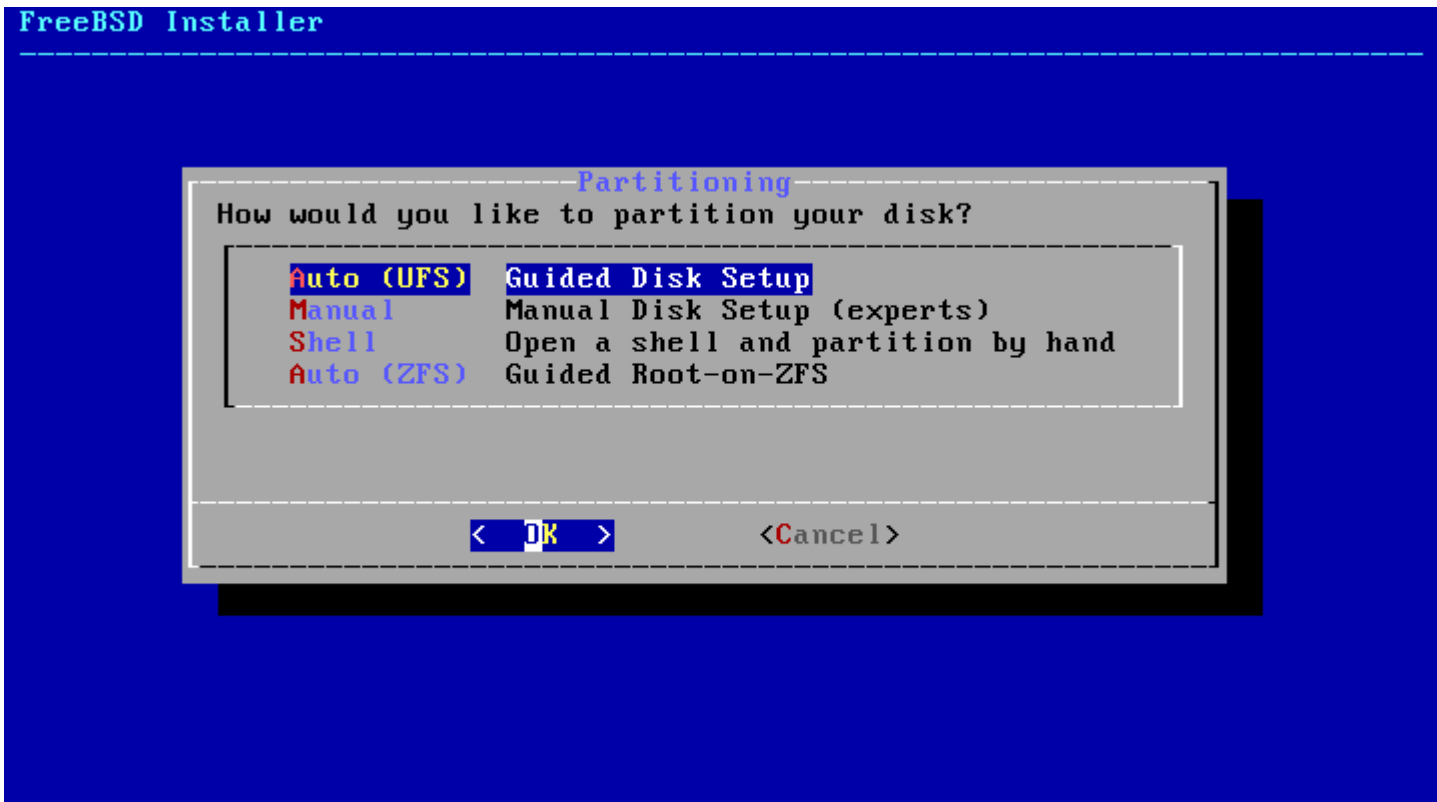
- ❑ Selecting components to install



bsdinstall – (6)

❑ Partitioning methods

- Shell – gpart(8) 、 fdisk(8) 、 bsdlablel(8)



bsdinstall – (7) Auto (ZFS)

❑ Guided Root-on-ZFS

- Enter a pool name, disable forcing 4k sectors, enable or disable encryption
- Switch between GPT (recommended) and MBR partition table types, and select the amount of swap space

```
FreeBSD Installer
-----
                ZFS Configuration
Configure Options:
>>> Install                Proceed with Installation
T Pool Type/Disks:         stripe: 0 disks
- Rescan Devices          *
- Disk Info               *
N Pool Name                zroot
4 Force 4K Sectors?       YES
E Encrypt Disks?          NO
P Partition Scheme        GPT (BIOS)
S Swap Size               2g
M Mirror Swap?            NO
W Encrypt Swap?           NO

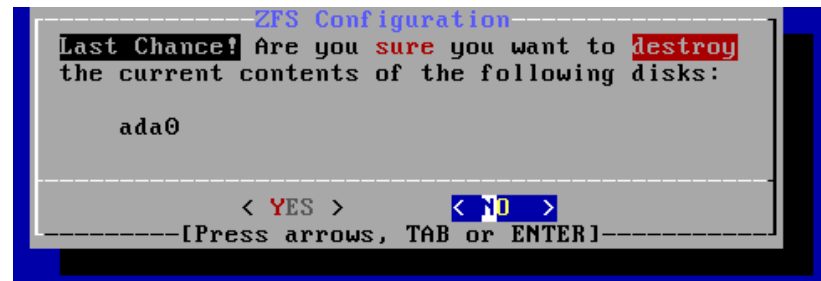
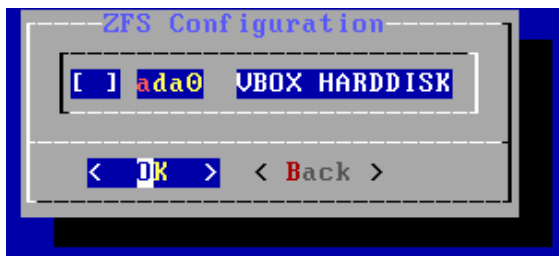
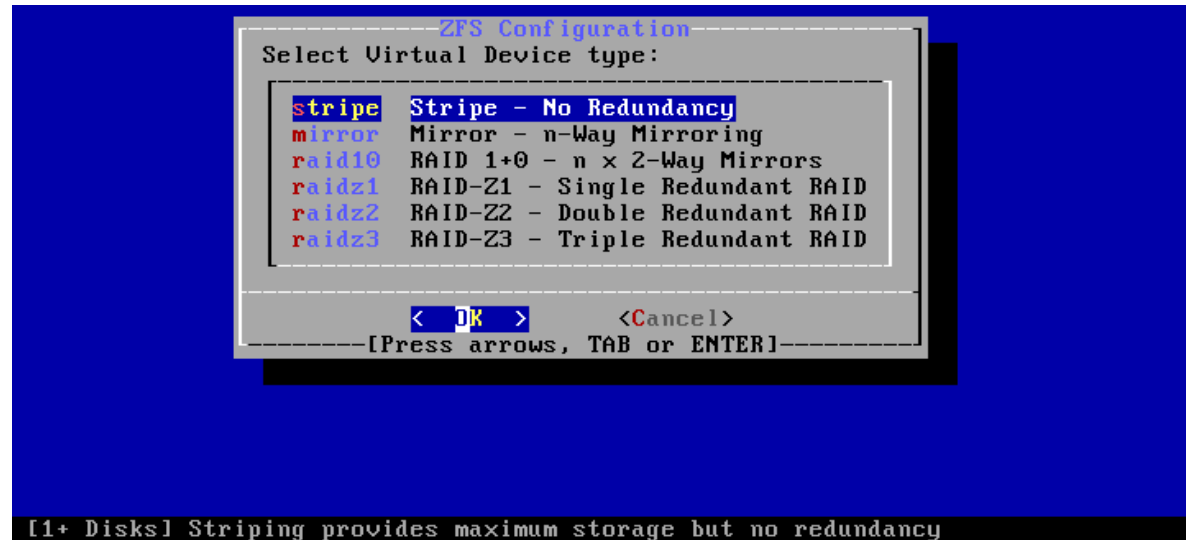
<Select>                 <Cancel>

Create ZFS boot pool with displayed options
```

bsdinstall – (8) Auto (ZFS)

❑ Virtual Device type

- Stripe
- Mirror
- RAID10
- RAID-Z 1, 2, 3



bsdinstall – (9)

❑ Fetching → Checksum Verification → Extraction

```
FreeBSD Installer
-----
          Fetching Distribution
-----
MANIFEST           [ Done       ]
base.txz           [ 46%      ]
kernel.txz         [ Pending   ]
lib32.txz          [ Pending   ]
ports.txz          [ Pending   ]

Fetching distribution files...

Overall Progress
[          ] 25%
```

bsdinstall – (10)

❑ Post-installation

- root password
- Network interfaces
 - Wired – Static IPv4 / DHCP / Static IPv6 / SLAAC
 - Wireless
 - DNS
- Time Zone
- Services
- System security hardening options
- Add users

Post-installation

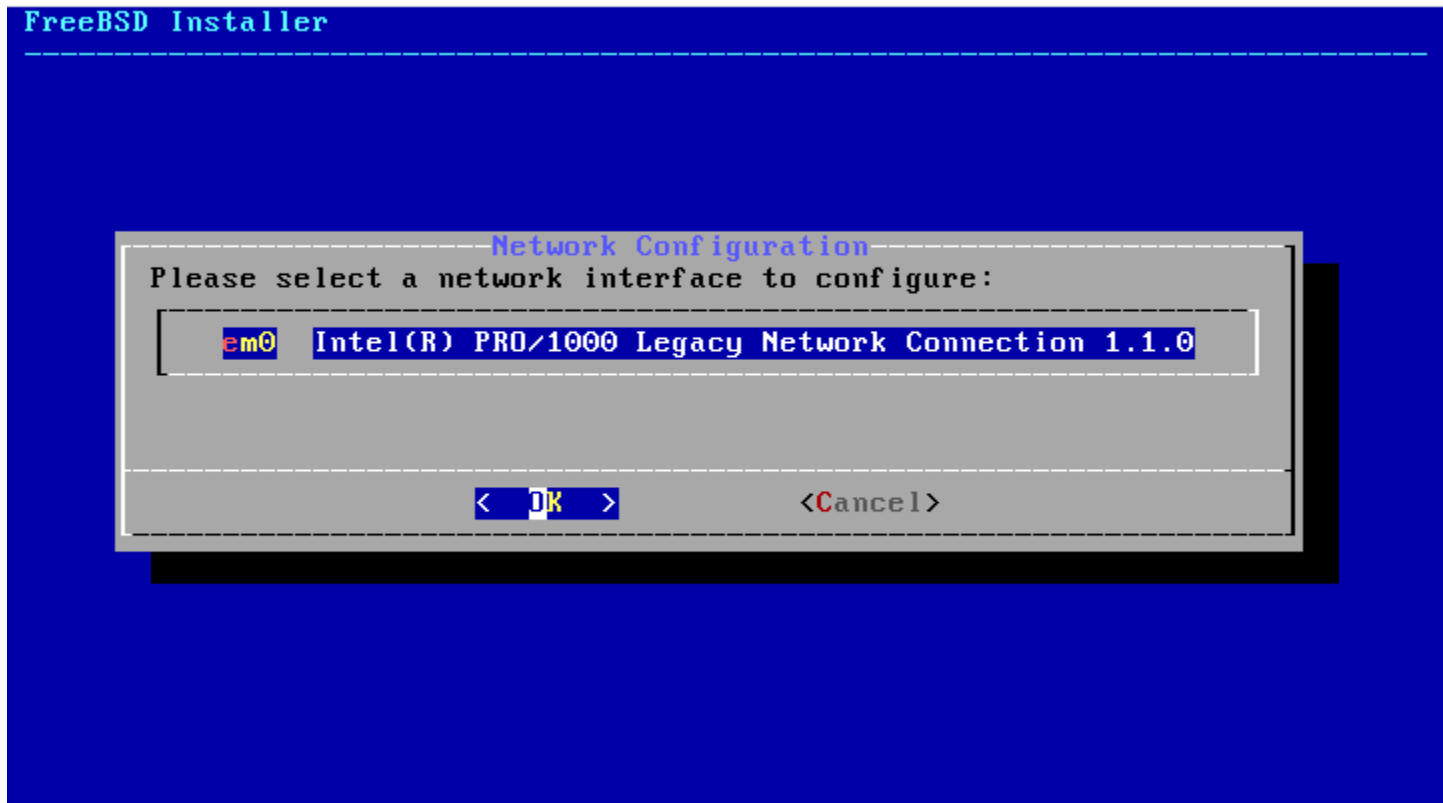
❑ Setting the root Password

```
FreeBSD Installer
=====

Please select a password for the system management account (root):
Changing local password for root
New Password:
Retype New Password:█
```

Post-installation

- ❑ Select a network interfaces



Post-installation

❑ Configuring IPv4 Networking

```
FreeBSD Installer
-----
Network Configuration
-----
Static Network Interface Configuration
-----
| IP Address      192.0.2.142 |
| Subnet Mask    255.255.255.0 |
| Default Router 192.0.2.1 |
-----
< OK > <Cancel>
```


Post-installation

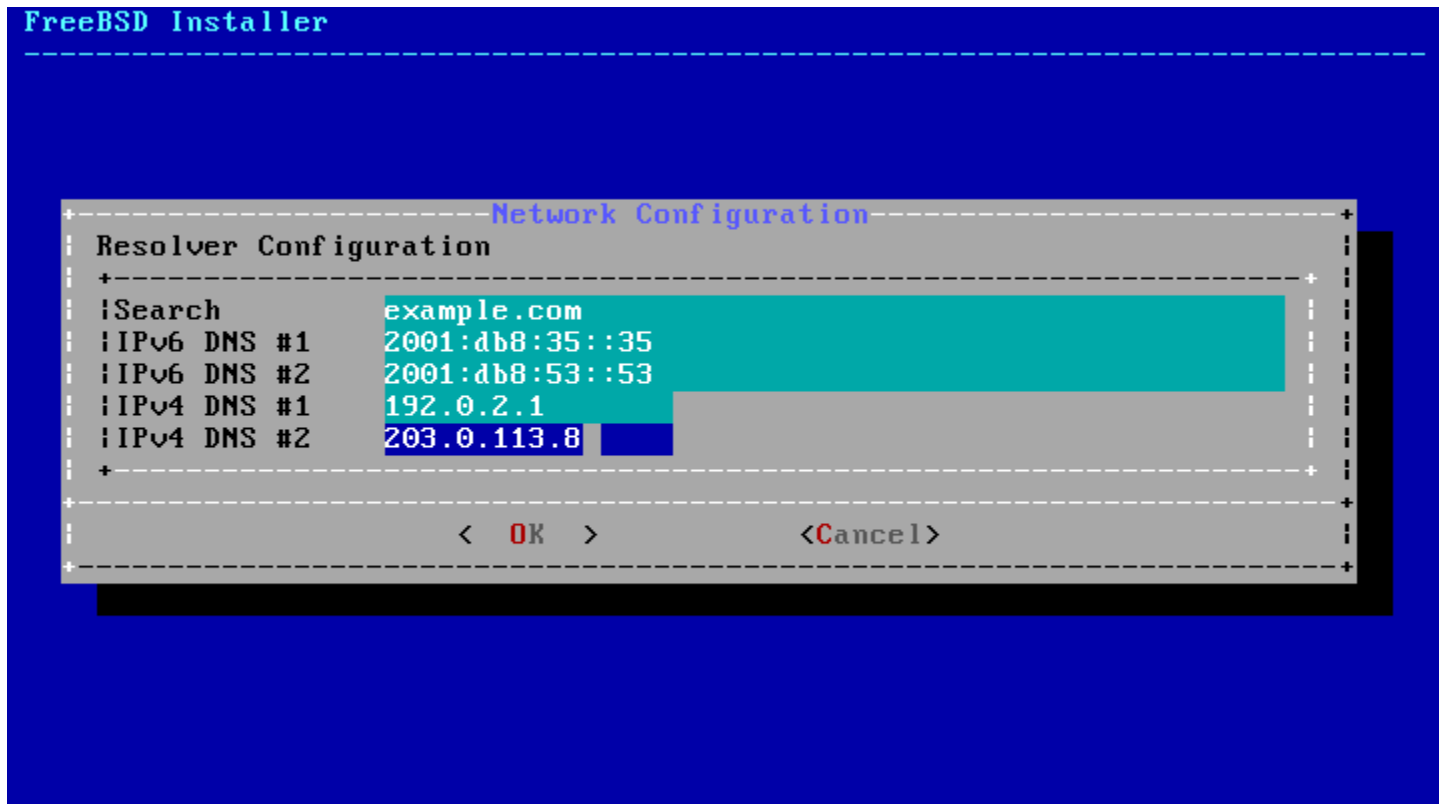
❑ Configuring IPv6 Networking

- IPv6 Stateless Address Auto configuration (SLAAC)

```
FreeBSD Installer
-----
Network Configuration
+-----+
Static IPv6 Network Interface Configuration
+-----+
|IPv6 Address      2001:db8:4672:6565:2026:5043:2d42:5344/64
|Default Router   2001:db8:4672:6565::1
+-----+
+-----+
|< OK >          |<Cancel>|
+-----+
```

Post-installation

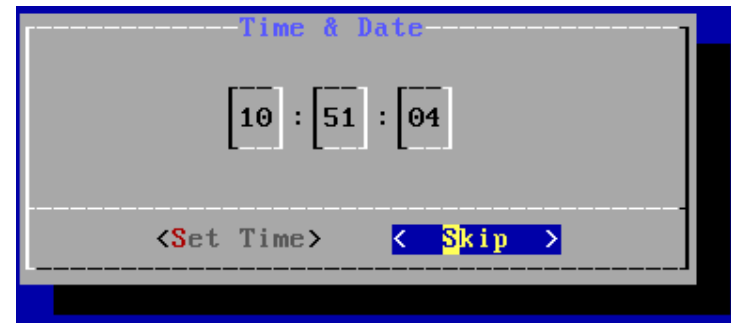
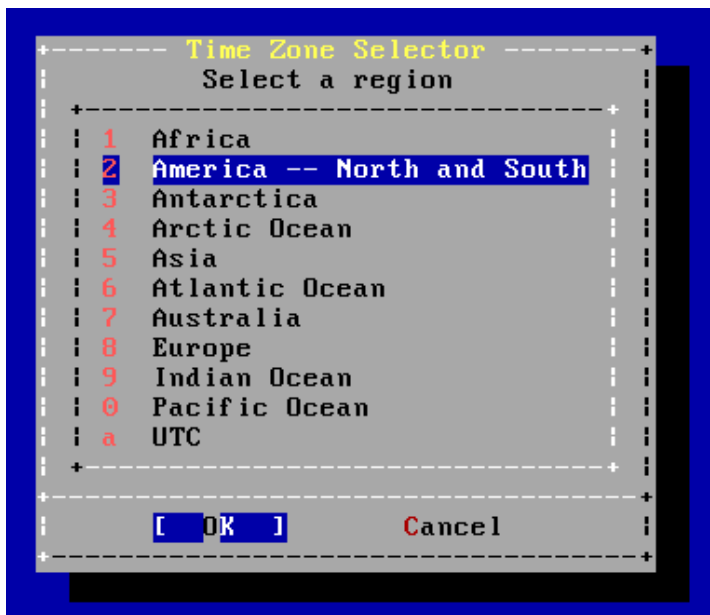
❑ Configuring DNS



Post-installation

❑ Setting the Time Zone

- 5 Asia → 42 Taiwan



Post-installation

❑ Selecting services to be enabled at boot

- Enable ntpd
- Disable dumpdev

FreeBSD Installer

System Configuration

Choose the services you would like to be started at boot:

```
[ ] local_unbound  Local caching validating resolver
[*] sshd           Secure shell daemon
[ ] moused        PS/2 mouse pointer on console
[*] ntpd          Synchronize system and network time
[ ] powerd        Adjust CPU frequency dynamically if supported
[*] dumpdev       Enable kernel crash dumps to /var/crash
```

< OK >

Post-installation

- ❑ Selecting system security hardening options



Post-installation

❑ Add Users

- Username - wangth
- Full name - Tse-Han Wang
- Uid - User ID. Typically left blank for default.
- Login group - The user's group.
- Invite *user* into other groups? - **wheel**
- Login class - Typically left blank for default.
- Shell - The interactive shell for this user. CSCC use **tcsh**.
- Home directory - The user's home directory.
- Home directory permissions - The default is usually correct.
- Use password-based authentication? - Typically "yes".
- Use an empty password? - Typically "no".
- Use a random password? - Typically "no".
- Enter password - The actual password for this user.
- Enter password again - The password must be typed again for verification.
- Lock out the account after creation? - Typically "no".

Post-installation

❑ Final Configuration

```
FreeBSD Installer
-----Final Configuration-----
Setup of your FreeBSD system is nearly complete. You can now
modify your configuration choices. After this screen, you will
have an opportunity to make more complex changes using a shell.
+-----+
| Exit           Apply configuration and exit installer |
| Add User      Add a user to the system |
| Root Password Change root password |
| Hostname      Set system hostname |
| Network       Networking configuration |
| Services      Set daemons to run on startup |
| Time Zone    Set system timezone |
| Handbook     Install FreeBSD Handbook (requires network) |
+-----+
| < OK > |
+-----+
```

FreeBSD Handbook

- ❑ Chapter 2. Installing FreeBSD (FreeBSD 9.0 Release and Later)
 - <http://www.tw.freebsd.org/doc/en/books/handbook/bsdinstall.html>
- ❑ Chinese resources
 - https://www.tw.freebsd.org/doc/zh_TW/books/handbook/bsdinstall.html

Appendix

bsdinstall – Manual (UFS)

bsdinstall – Manual (UFS)

❑ Guided Partitioning result

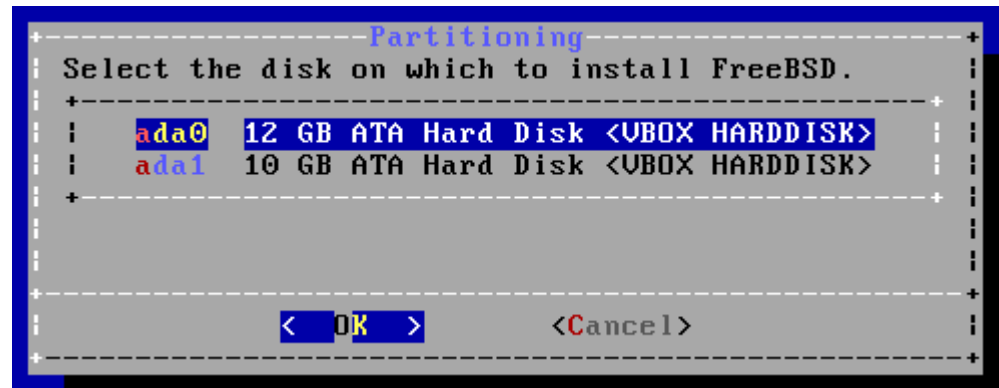
```
FreeBSD Installer
-----
Partition Editor
Please review the disk setup. When complete, press
the Finish button.
+-----+
| ada0      12 GB      GPT      |
|  ada0p1   64 kB     freebsd-boot |
|  ada0p2   11 GB     freebsd-ufs  /  |
|  ada0p3   627 MB    freebsd-swap  none |
|-----|
|
|
|
|
|
|
+-----+
| <Create> <Delete> <Modify> <Revert> <Auto> <Finish> |
+-----+

Add a new partition
```

bsdinstall – (7) Manual

❑ Guided Partitioning

- Select disk



- How to partition the disk
 - Entire Disk
 - Partition – use free space



bsdinstall – (8) Manual

❑ Manual Partitioning

```
FreeBSD Installer
-----
Partition Editor
Create partitions for FreeBSD. No changes will be
made until you select Finish.
+-----+
| ada0          12 GB |
+-----+
+-----+
| <Create> <Delete> <Modify> <Revert> <Auto> <Finish> |
+-----+
```

Add a new partition

bsdinstall – (9) Manual

❑ Choose a partitioning scheme

- Master Boot Record (MBR)
 - 4 Primary Partition, 1 Extended Partition, multiple Logical Partition
- GUID Partition Table (GPT)
 - 128 Partitions per disk
- **DON'T use BSD!!!**



bsdinstall – (10) Manual

❑ Add partitions

- freebsd-boot
 - FreeBSD boot code. This partition must be first on the disk.



bsdinstall – (11) Manual

❑ Final confirmation

```
FreeBSD Installer
-----
+----- Partition Editor -----+
| Please review the disk setup. When complete, press |
| the Finish button.                               |
+----- Confirmation -----+
| Your changes will now be written to disk. If you  |
| have chosen to overwrite existing data, it will  |
| be PERMANENTLY ERASED. Are you sure you want to  |
| commit your changes?                             |
+-----+
| < Commit > < Revert & Exit > < Back > |
+-----+
+-----+
| < Create > < Delete > < Modify > < Revert > < Auto > < Finish > |
+-----+

Exit partitioner (will ask whether to save changes)
```