FreeBSD

wengyc

Outline

❑ FreeBSD version

- 11.2-RELEASE

❑ Installing FreeBSD

- From CD-ROM

- From USB

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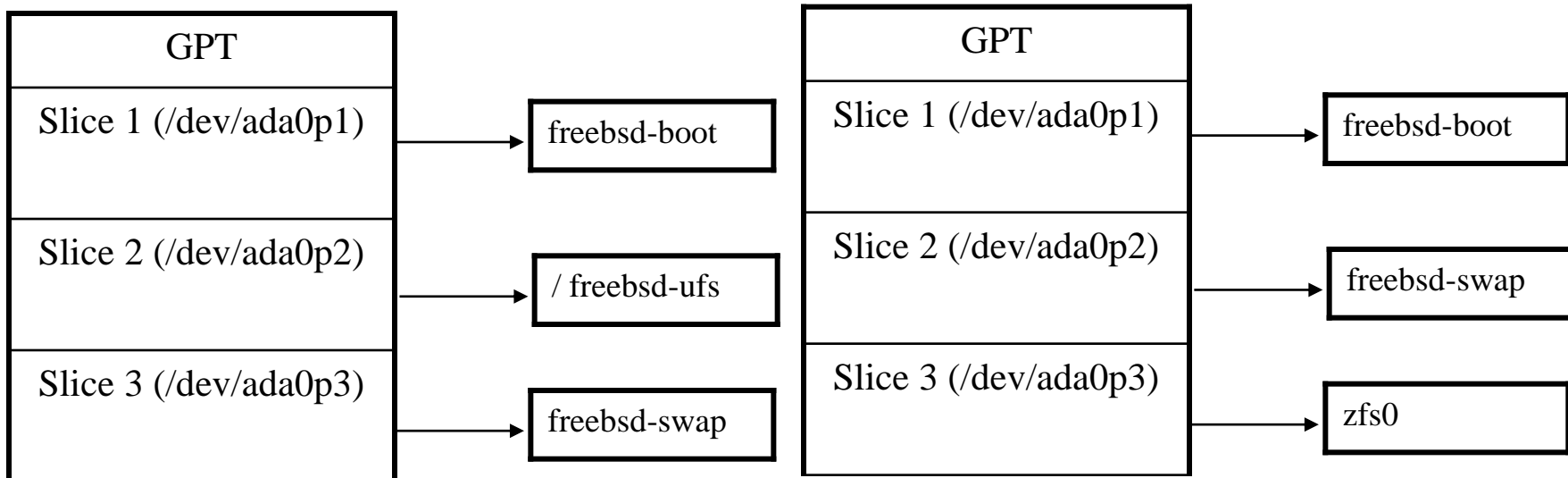
❑ FreeBSD−A.B.C−Type
- A: major version Number
- B: minor version Number
- C: slight patch version number
- Type: version type
  - ➢ PRERELEASE
  - ➢ BETA
  - ➢ RC
  - ➢ RELEASE
  - ➢ STABLE
  - ➢ CURRENT

FreeBSD Installation

FreeBSD View of Disk (1)

❑ Guided partitioning layout between UFS and Root on ZFS

GPT
Slice 1 (/dev/ada0p1)
Slice 2 (/dev/ada0p2)
Slice 3 (/dev/ada0p3)

→ freebsd-boot

→ / freebsd-ufs

→ freebsd-swap

GPT
Slice 1 (/dev/ada0p1)
Slice 2 (/dev/ada0p2)
Slice 3 (/dev/ada0p3)

→ freebsd-boot

→ freebsd-swap

→ zfs0

FreeBSD View of Disk (2)

MBR
Slice 1 (ada0s1)
Slice 2 (ada0s2)
Slice 3 (ada0s3)
Slice 4 (ada0s4)

Slice 1 (ada0s1) → Windows XP (NTFS)

Slice 2 (ada0s2) → Linux (EXT4FS)

Slice 3 (ada0s3) →

bsdlabel
ada0s3a
ada0s3b
ada0s3c
ada0s3d
ada0s3e

ada0s3a → / (root)

ada0s3b → swap

ada0s3e → /home

Slice 4 (ada0s4) →

Extended Partiton

D Drive NTFS	Linux Swap
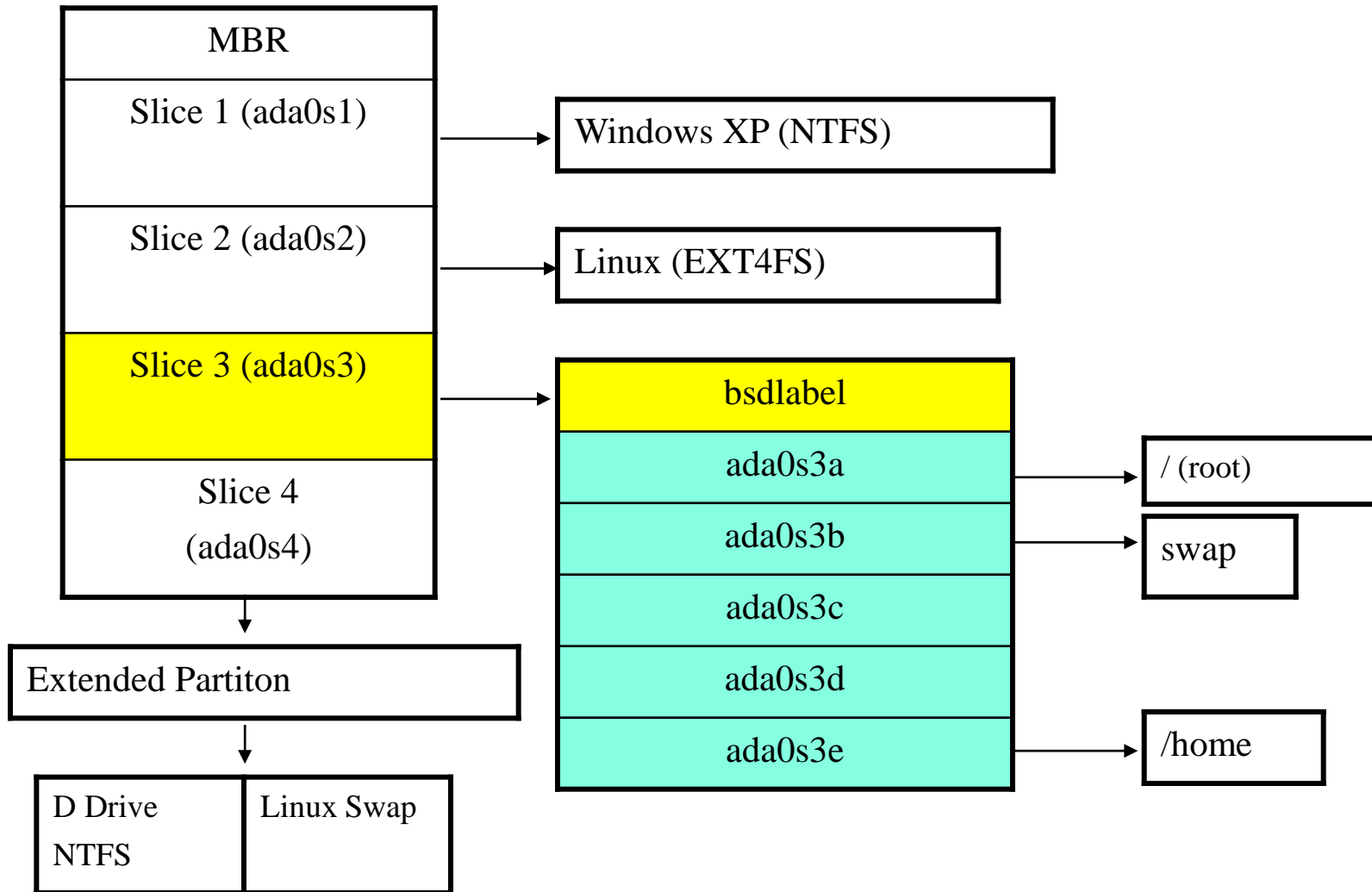
FreeBSD View of Disk (3)

❑ What is the meaning of **ada0s1a**

- Disk name
  - ➢ ada : IDE, SATA
  - ➢ da: SCSI, usb stick
- Slice is equal to the <u>partition</u> 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, ...

MBR
Slice 1 (/dev/ada0s1)
Slice 2 (/dev/ada0s2)
Slice 3 (/dev/ada0s3)
Slice 4 (/dev/ada0s4)

Slice 5 (/dev/ada0s5)	Slice 6 (/dev/ada0s6)
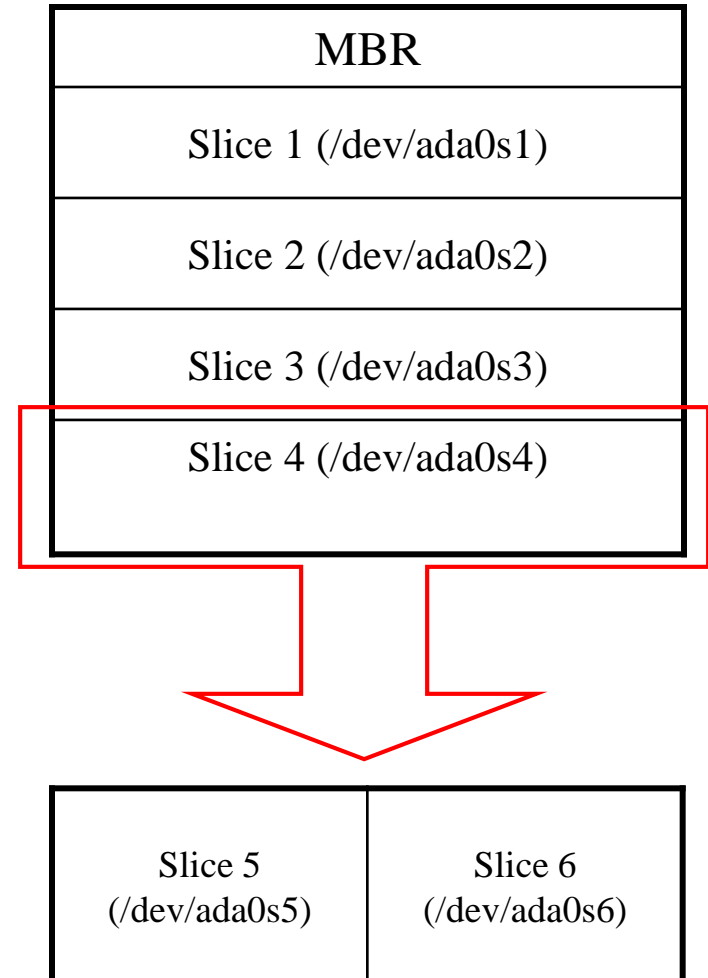
Knowing Your Hardware

- ❑ 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

```
                 _____        _____  _____ _____
                |  _____|      |  __  \/  ____|  _____ \
                | |_____ _____| |  \  | (___ | |    | |
                |  _____|  ___  | |   | |\___ \| |    | |
                | |     | |   | | |__/  |____) | |____| |
                |_|     |_|   |_|_____/\_____/|_____/
                                              .'`
             =======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

bsdinstall – (3)

❑ Select keymap

bsdinstall – (4)

❑ Setting hostname

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

bsdinstall – (5)

❑ Selecting components to install

bsdinstall – (6)

Computer Center, CS, NCTU
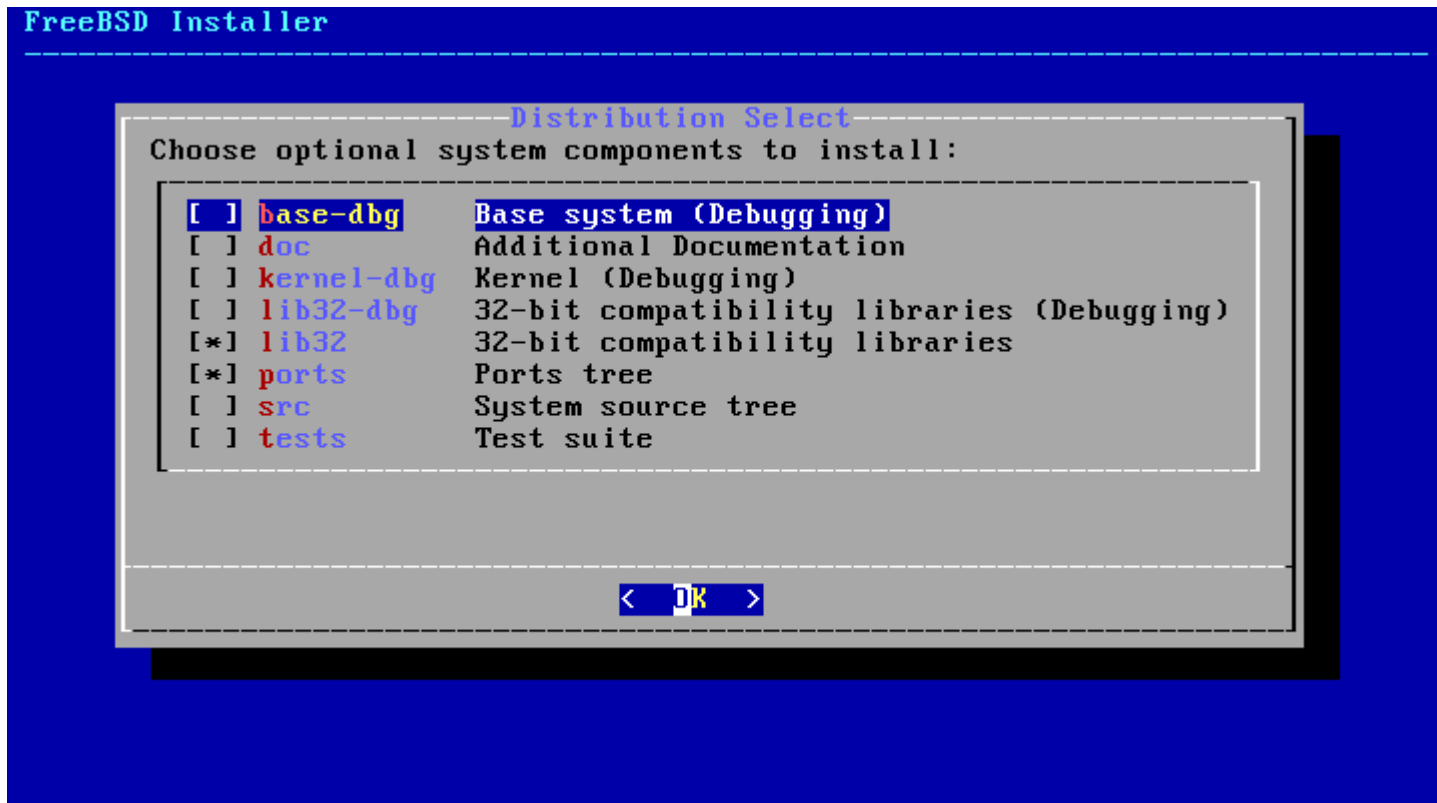
❑ Partitioning methods

- Shell – gpart(8)、fdisk(8)、bsdlabel(8)
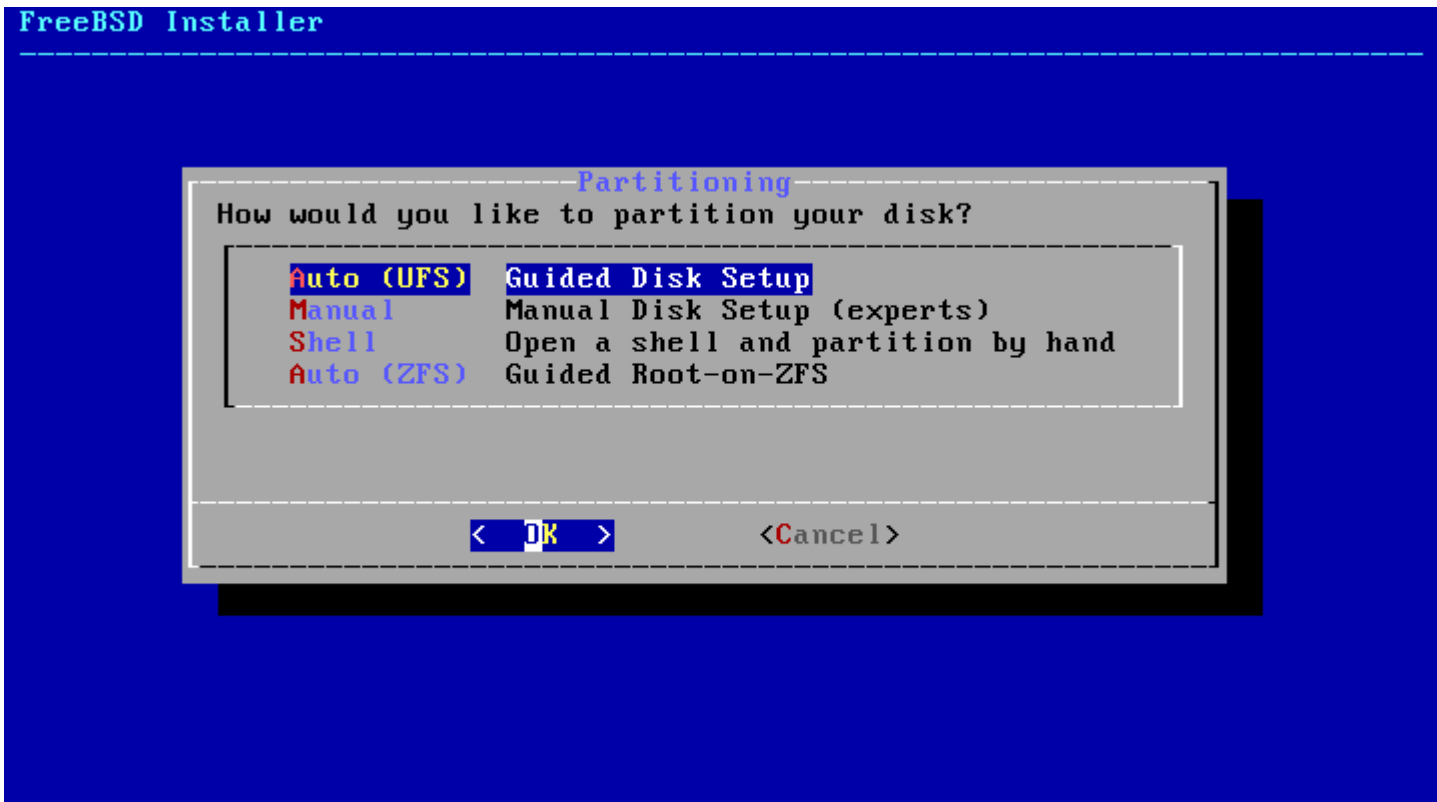
bsdinstall – (7) Auto (ZFS)

❑ 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

bsdinstall – (8) Auto (ZFS)

❑ Virtual Device type

- Stripe
- Mirror
- RAID10
- RAID-Z 1, 2, 3
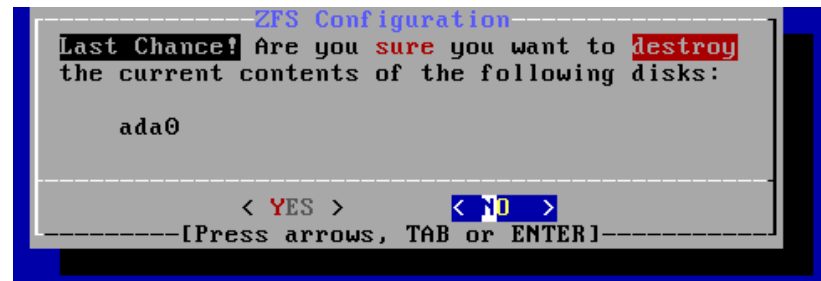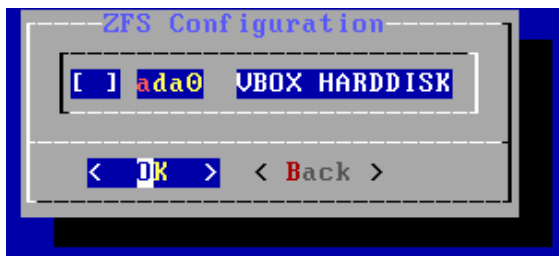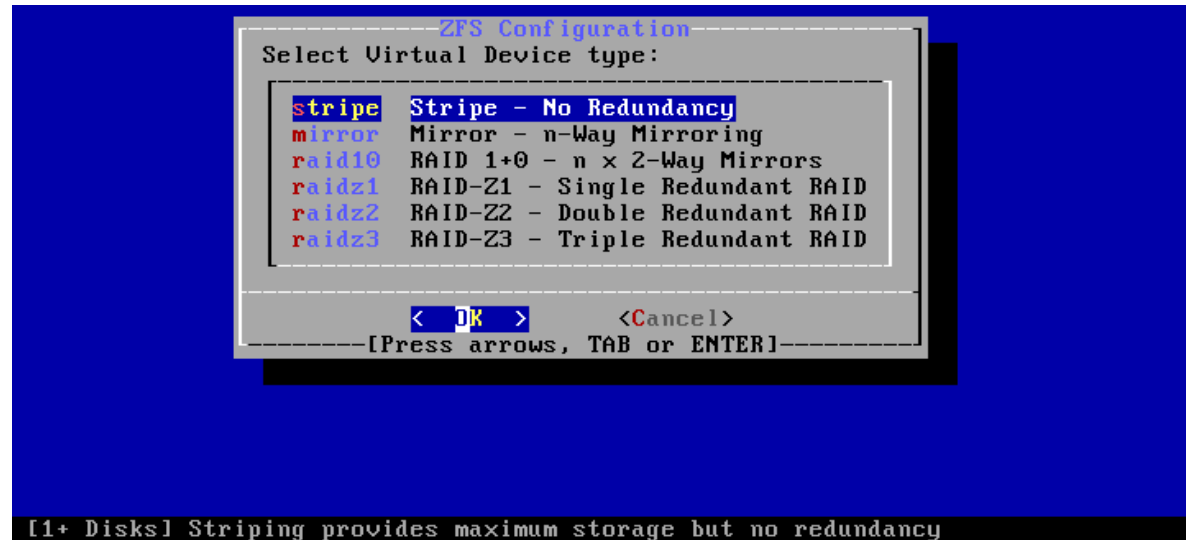
bsdinstall – (9)

❑ Fetching → Checksum Verification → Extraction

bsdinstall – (10)

❑ Post-installation

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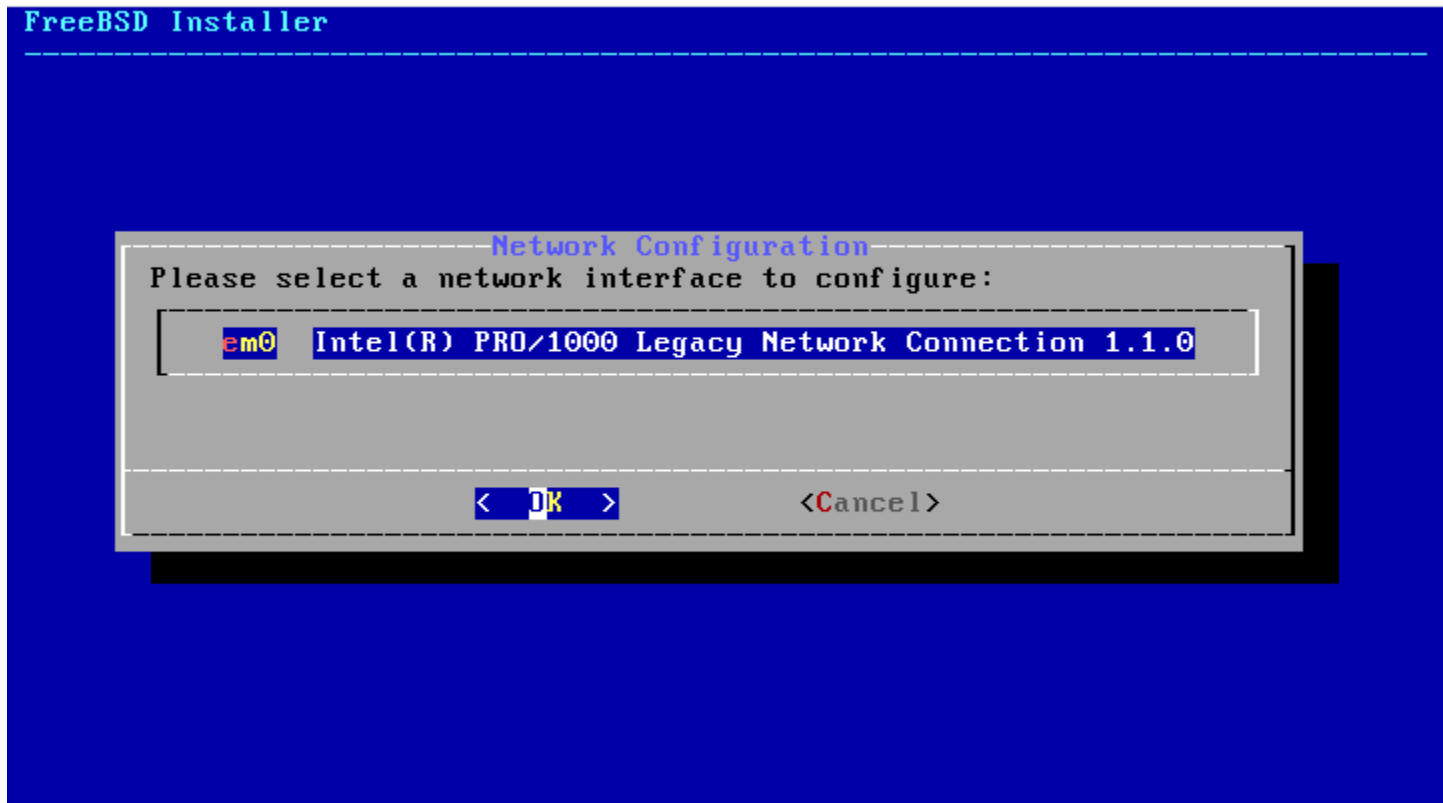- Add users

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

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
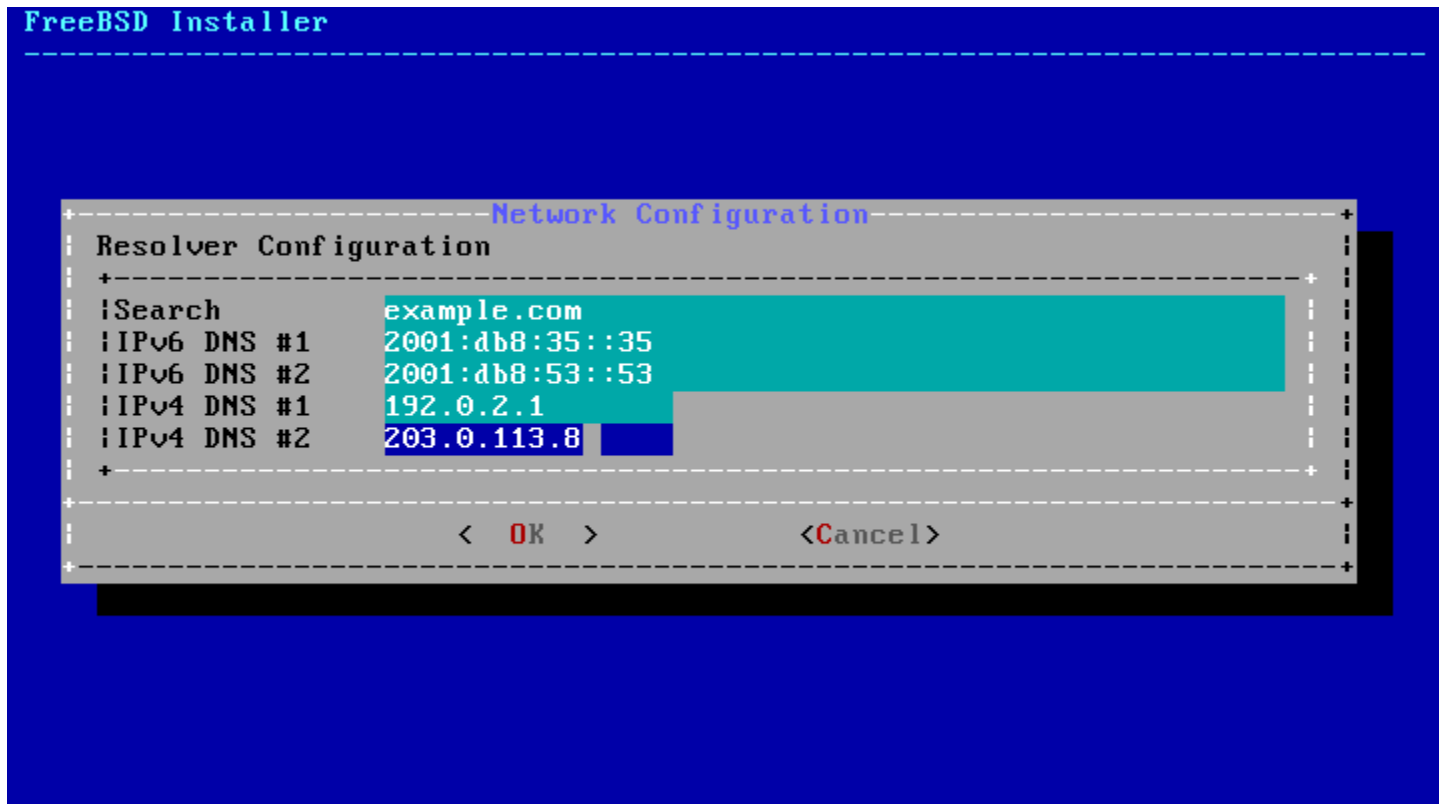
Post-installation

❑ Setting the Time Zone

- 5 Asia → 42 Taiwan

Post-installation

❑ Selecting services to be enabled at boot

- Enable ntpd

- Disable dumpdev

Post-installation

❑ Selecting system security hardening options


```
FreeBSD Installer
------------------------------------------------------------------------
                          System Hardening
Choose system security hardening options:

    [ ] Hide processes running as other users
    [ ] Hide processes running as other groups
    [ ] Disable reading kernel message buffer for unprivileged users
    [ ] Disable process debugging facilities for unprivileged users
    [ ] Randomize the PID of newly created processes
    [ ] Insert stack guard page ahead of the growable segments
    [ ] Clean the /tmp filesystem on system startup
    [ ] Disable opening Syslogd network socket (disables remote logging)
    [ ] Disable Sendmail service

                          <  OK  >
```
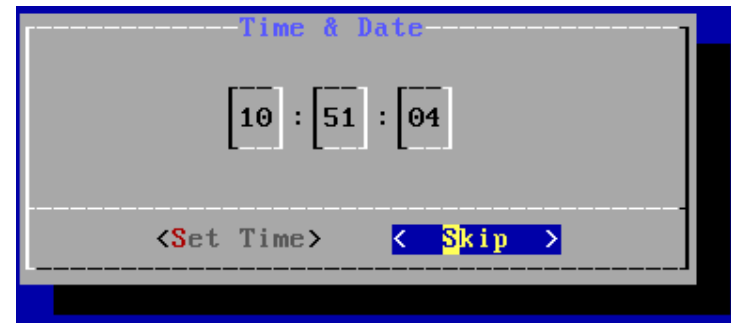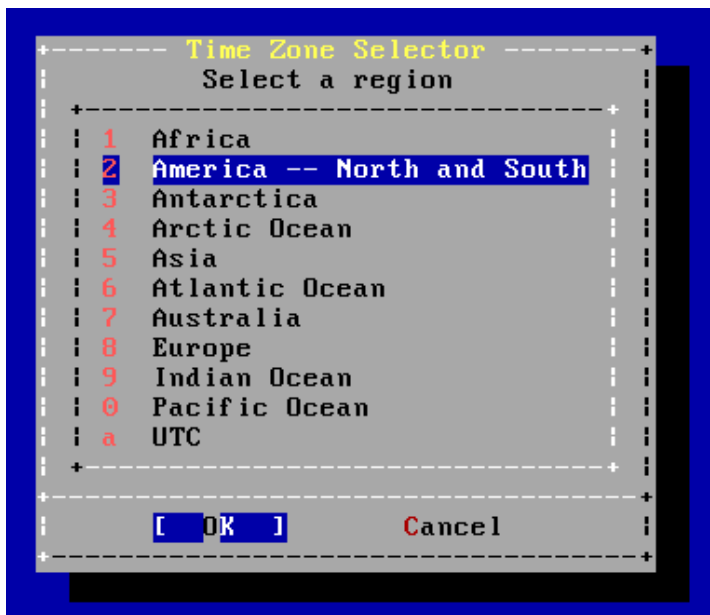
Post-installation

❑ 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)
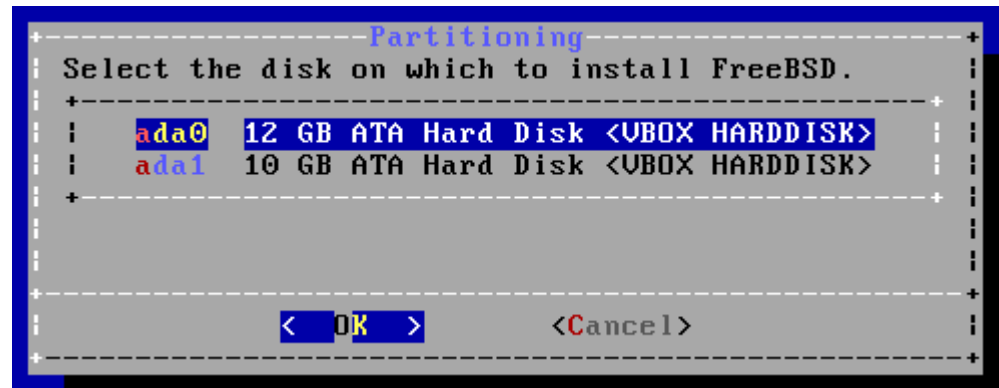
❑ Guided Partitioning result

bsdinstall – (7) Manual

❑ Guided Partitioning

- Select disk

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

bsdinstall – (8) Manual

❑ Manual Partitioning

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