

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

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# Outline

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- ❑ FreeBSD version
  - 11.1-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

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# FreeBSD Branches/Tags

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## ❑ Three parallel development branches:

- *-RELEASE*
  - Latest Release Version:
    - 11.1 (July, 2017)
    - <http://www.freebsd.org/releases/>
  - Upcoming 10.4 (October, 2017)
    - <https://www.freebsd.org/releases/10.4R/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

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## ❑ 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

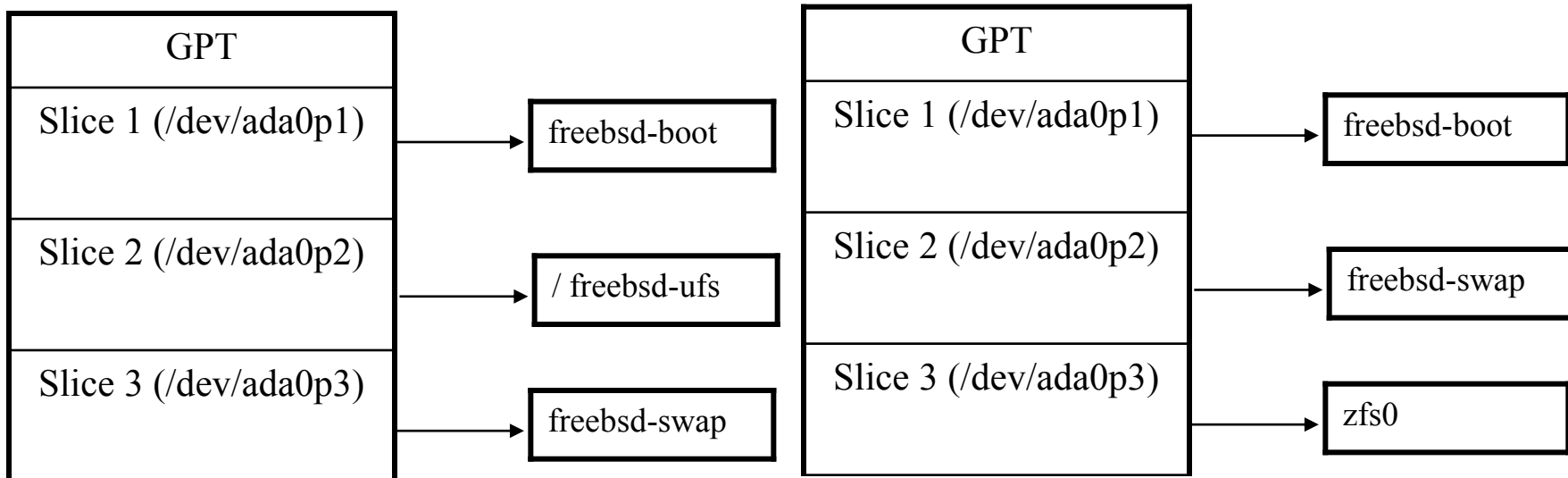
A decorative graphic on the left side of the slide, consisting of several overlapping blue rectangles of varying shades and sizes, creating a layered effect.

# FreeBSD Installation

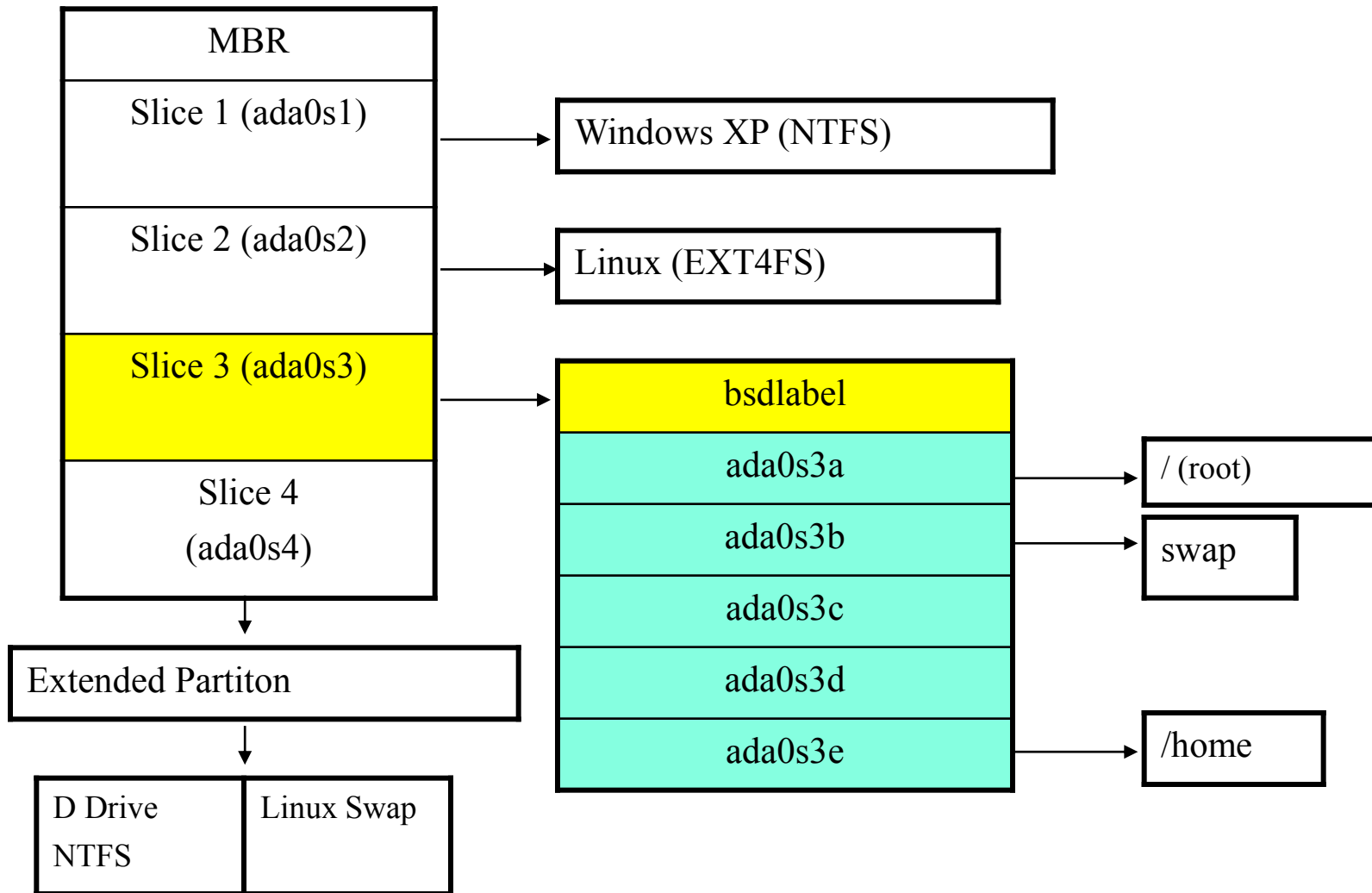
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# FreeBSD View of Disk (1)

- ❑ Guided partitioning layout between UFS and Root on ZFS



# FreeBSD View of Disk (2)

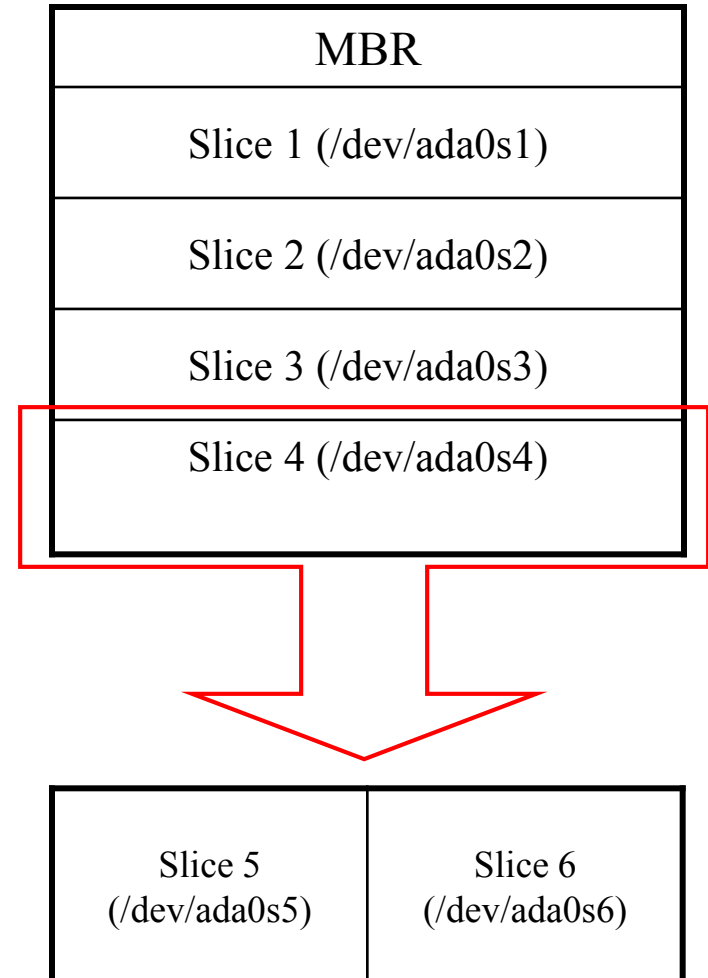




# FreeBSD View of Disk (3)

## ❑ 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

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- ❑ 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

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- 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 screenshot shows the FreeBSD boot loader menu. At the top, the word "FreeBSD" is displayed in a large, dashed, white 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, and Options: 5. Kernel: default/kernel (1 of 2), 6. Configure Boot Options... The word "kernel" in option 5 is highlighted in green. Below the box, the text "Autoboot in 9 seconds. [Space] to pause" is displayed. To the right of the menu, 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 – (4)

## ❑ Setting hostname

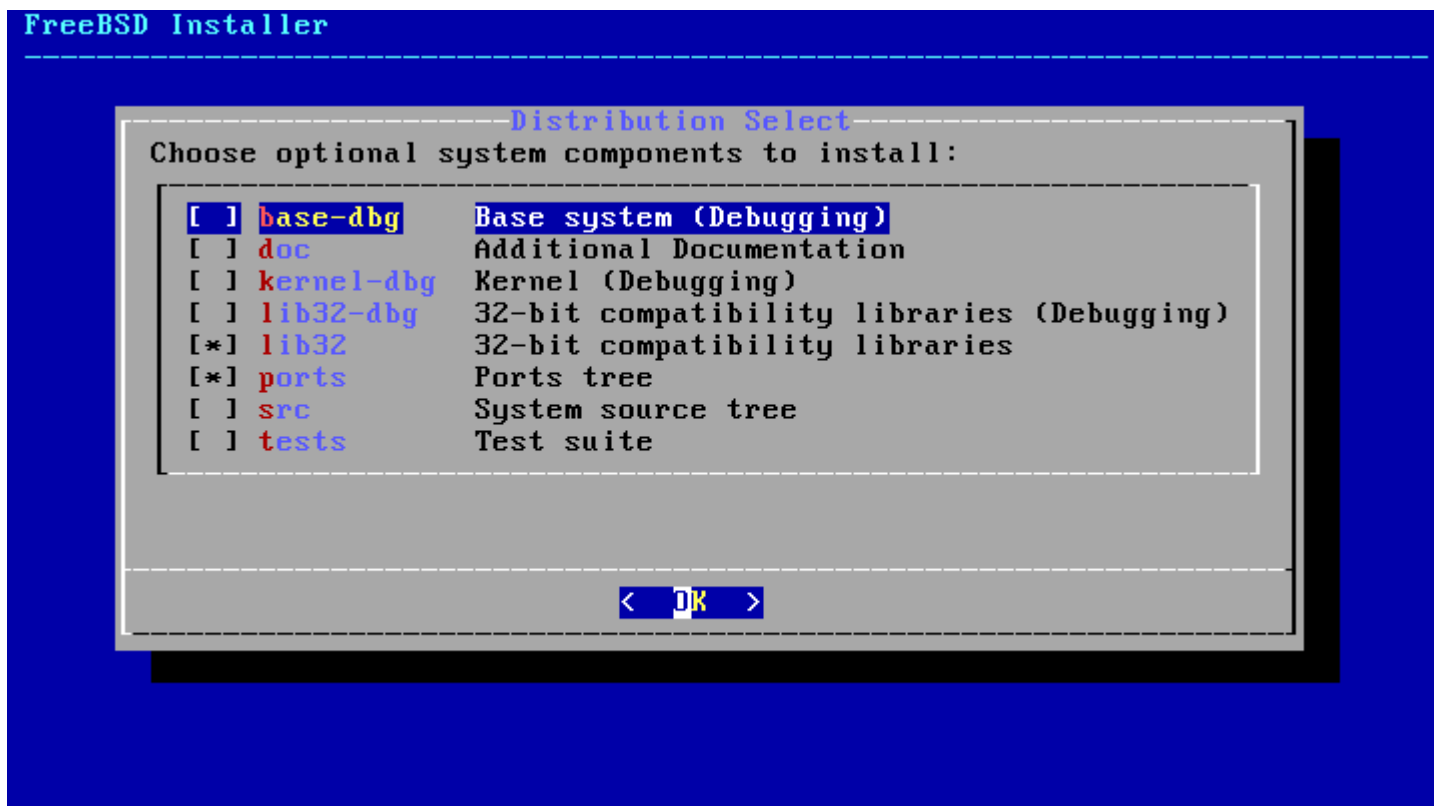
- e.g., xxxsa.cs.nctu.edu.tw

```
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

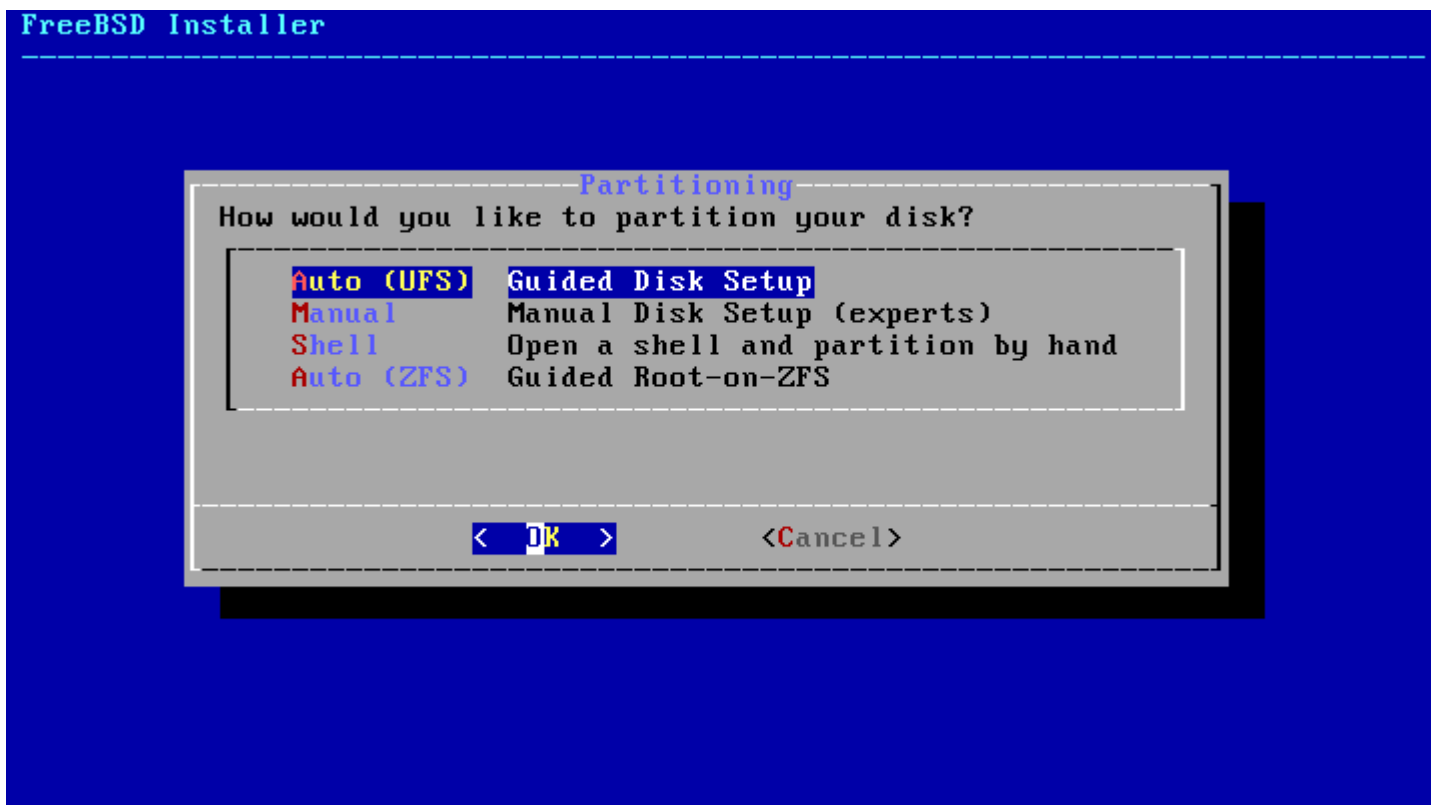




# bsdinstall – (6)

## ❑ 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

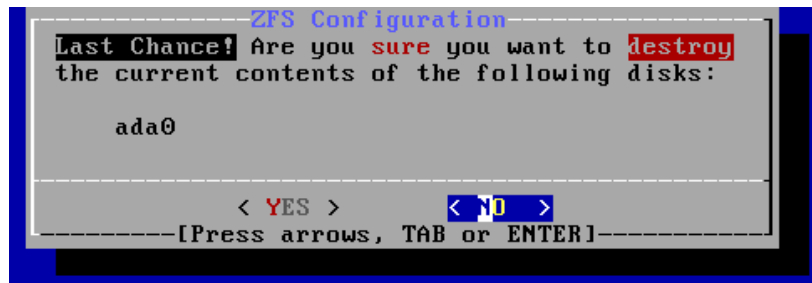
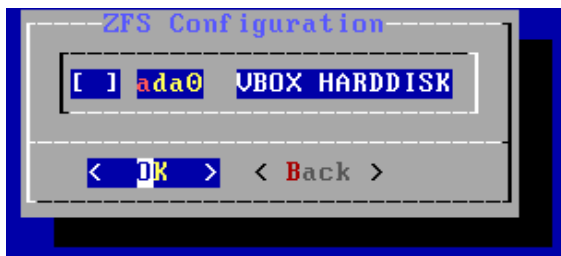
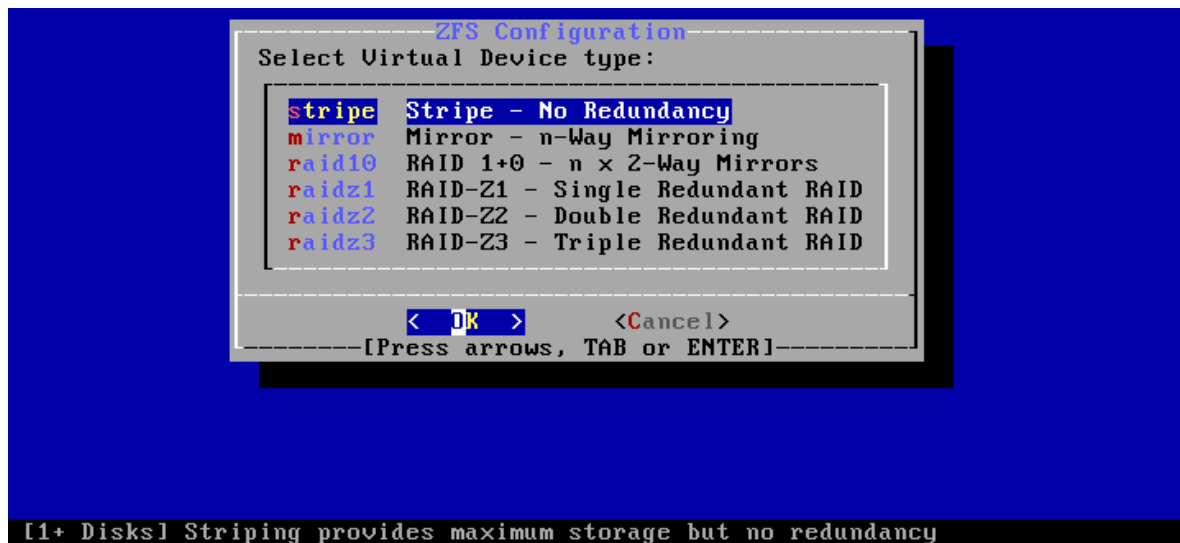
<Select>                 <Cancel>

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)

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## ❑ 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

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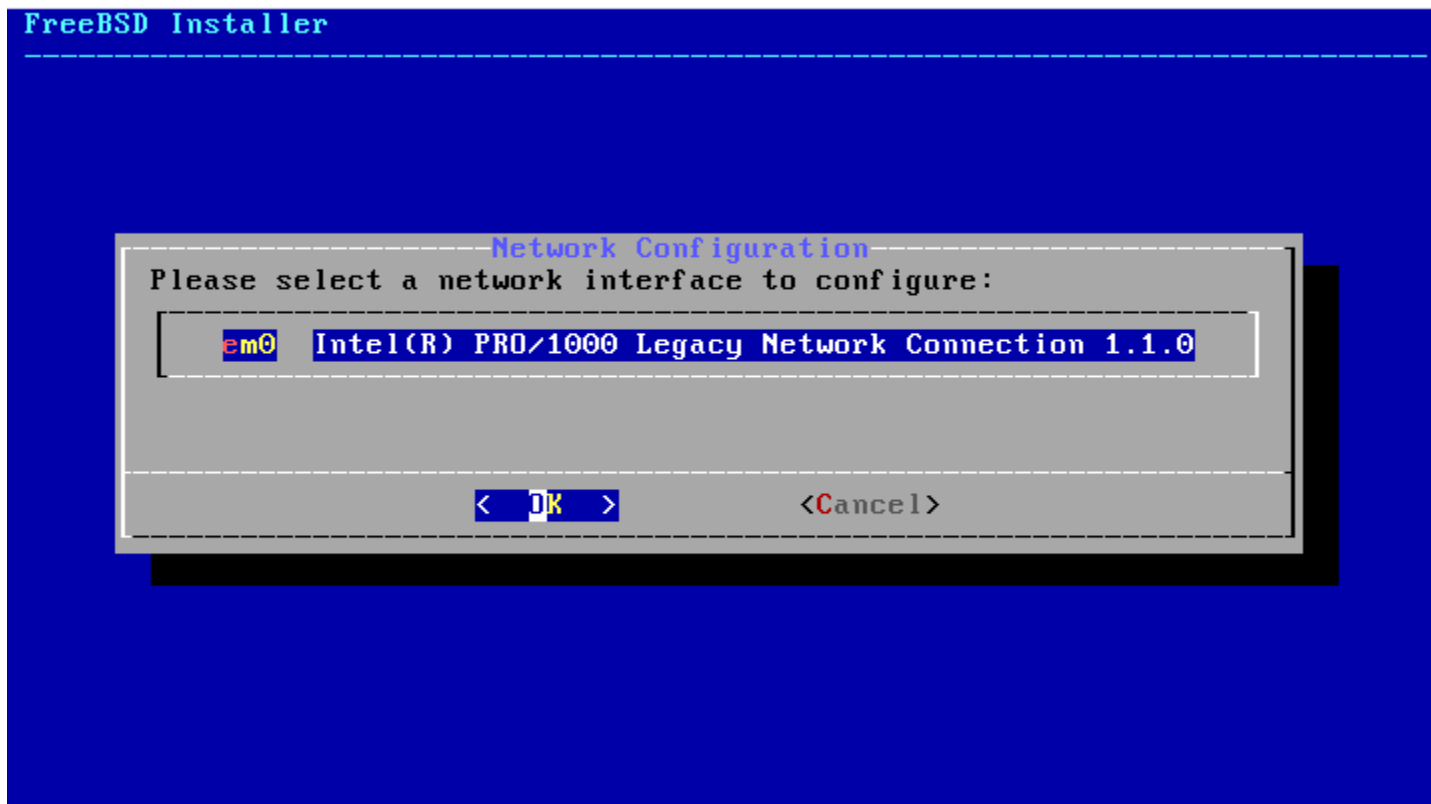
## ❑ Setting the root Password

```
FreeBSD Installer
=====

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

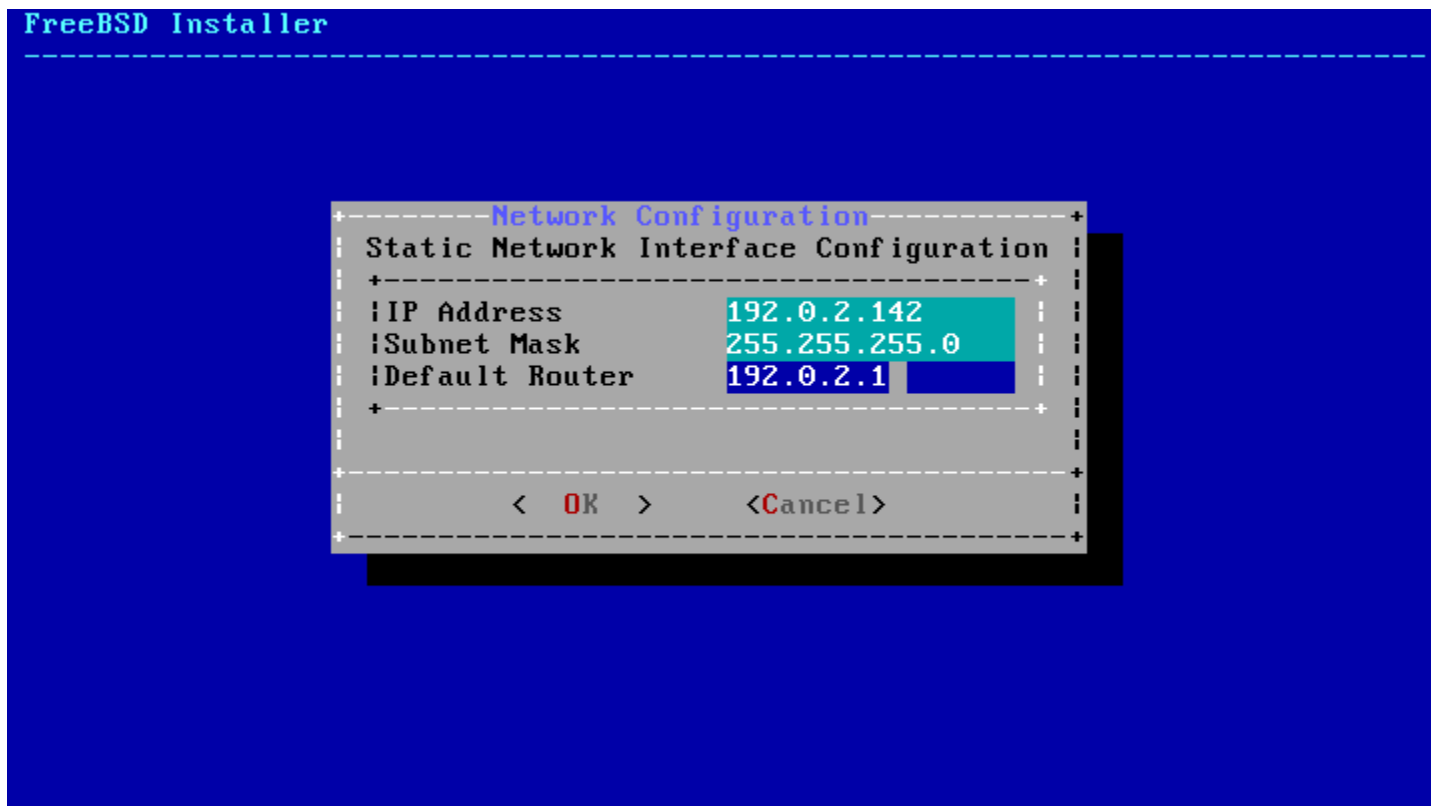
# Post-installation

- ❑ Select a network interfaces



# Post-installation

## ❑ Configuring IPv4 Networking

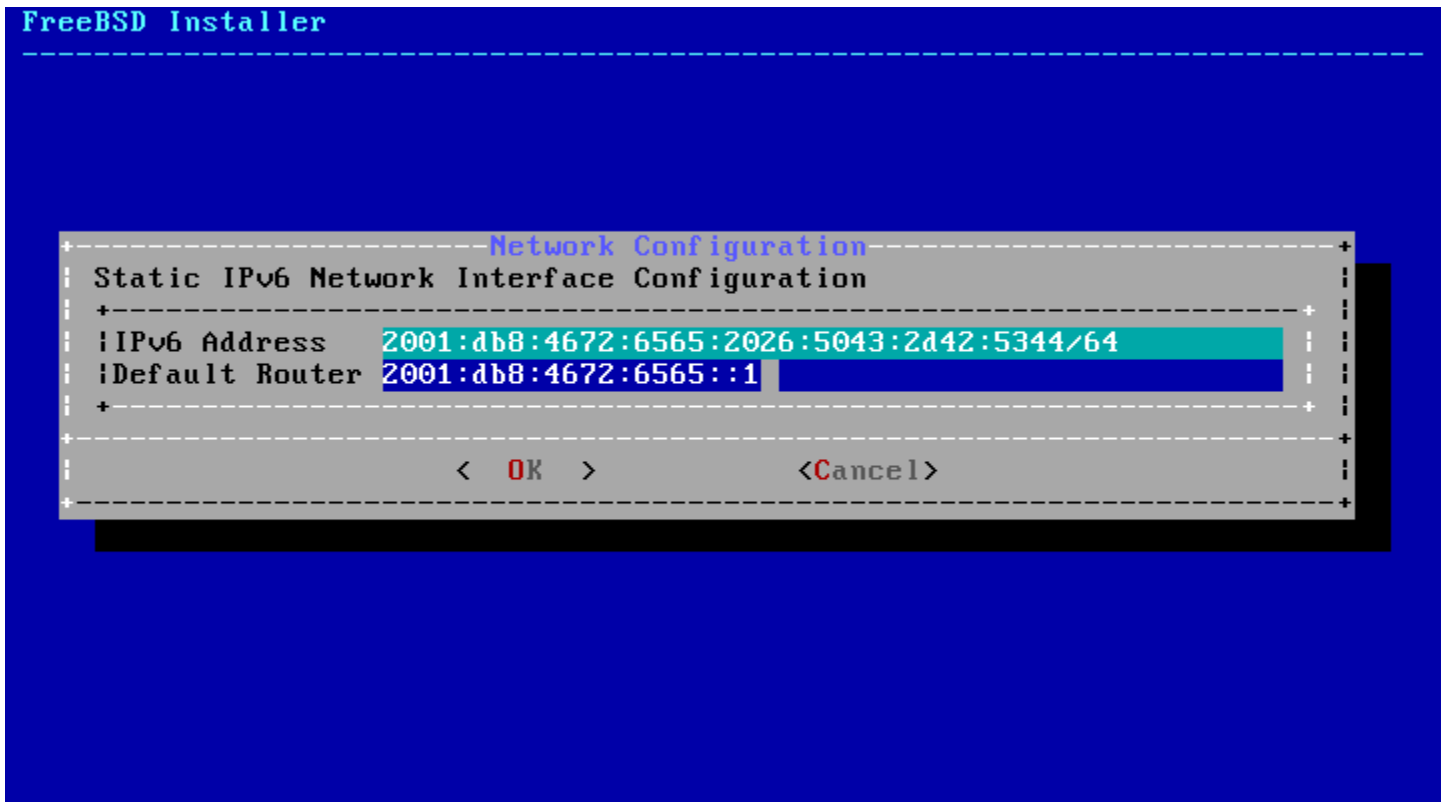




# Post-installation

## ❑ Configuring IPv6 Networking

- IPv6 Stateless Address Auto configuration (SLAAC)

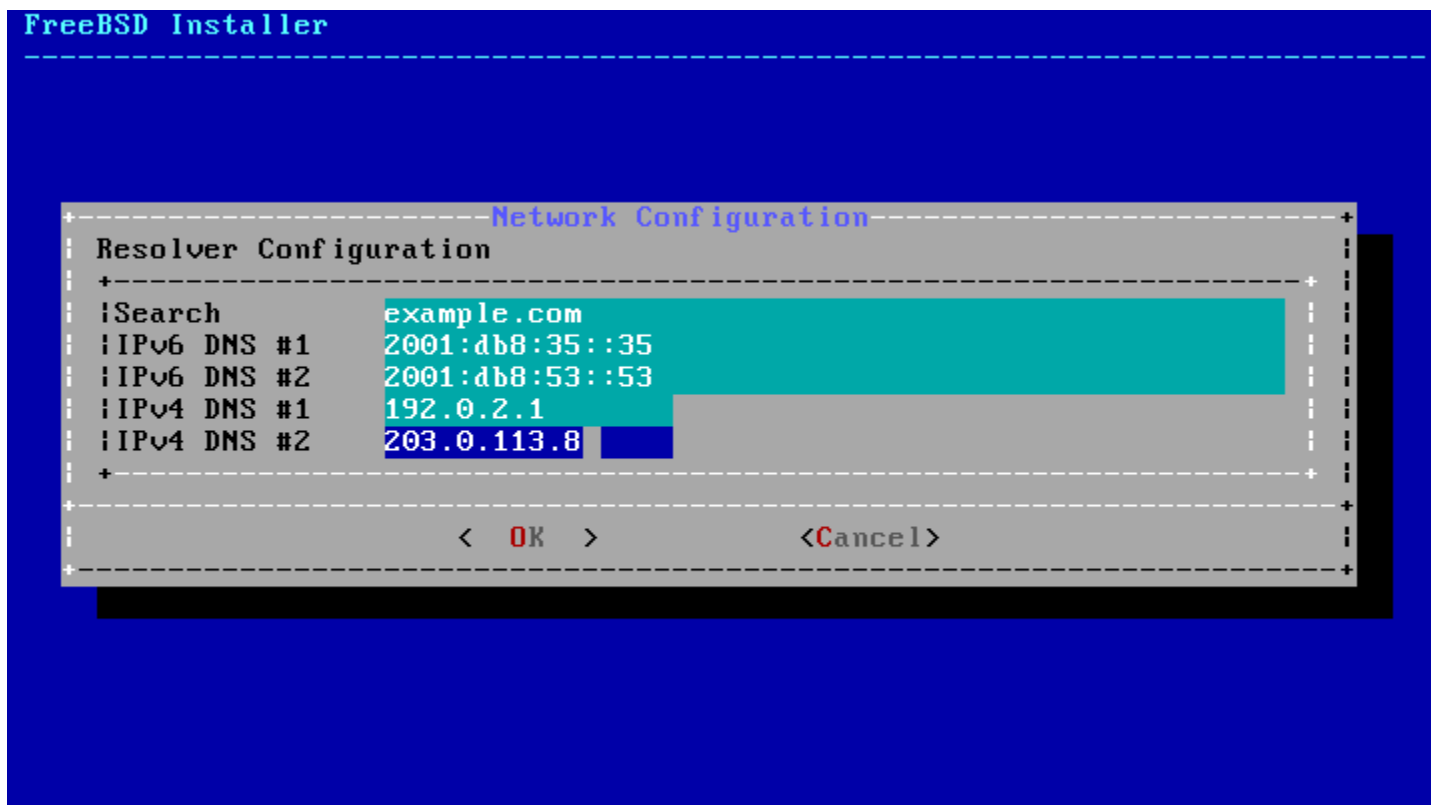


The screenshot shows the FreeBSD Installer's network configuration interface. The title bar reads "FreeBSD Installer". Below it, a dashed line separates the header from the main content. The main content is titled "Network Configuration" and "Static IPv6 Network Interface Configuration". It displays two configuration fields: "IPv6 Address" with the value "2001:db8:4672:6565:2026:5043:2d42:5344/64" and "Default Router" with the value "2001:db8:4672:6565::1". At the bottom, there are two buttons: "< OK >" and "<Cancel>".

```
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

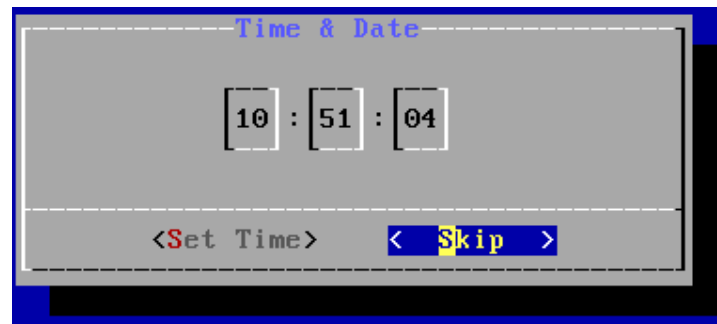
## ❑ Configuring DNS



# 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

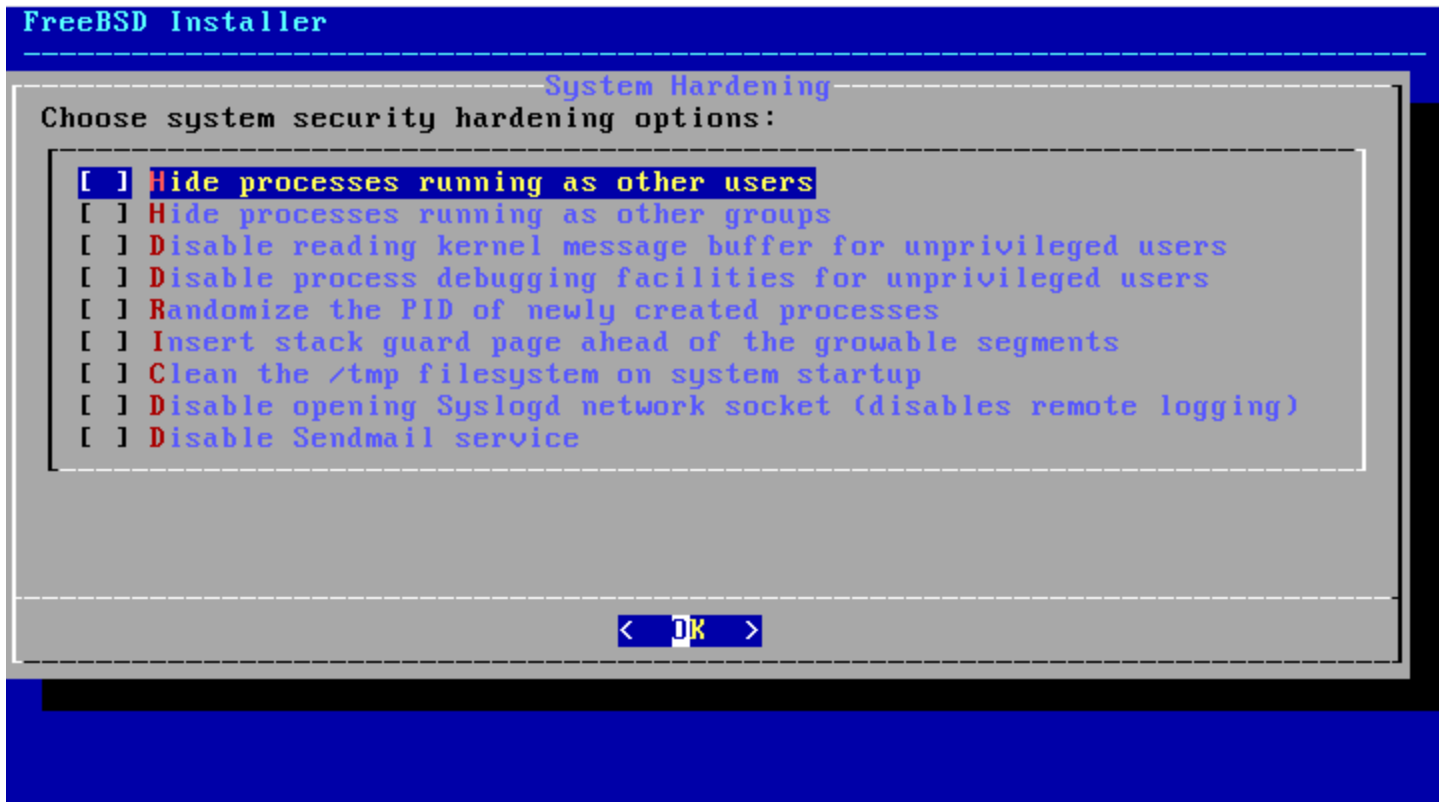
Choose the services you would like to be started at boot:

```
[ ] 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

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## ❑ 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

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- ❑ Chapter 2. Installing FreeBSD (FreeBSD 9.0 Release and Later)
  - <http://www.tw.freebsd.org/doc/en/books/handbook/bsdinstall.html>
- ❑ Chinese resources
  - [http://www.tw.freebsd.org/doc/zh\\_TW/books/handbook/install.html](http://www.tw.freebsd.org/doc/zh_TW/books/handbook/install.html)
  - Chapter 2 Installing FreeBSD 8.X and Earlier





# Appendix

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bsdinstall – Manual (UFS)





# 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)
```