CSNA HW1

FreeBSD Installation

Sian-Jhe Lin

2016.09.29 Thu.

Outline

- HW1 evaluation
- FreeBSD installation
- Build world and kernel
- Software installation

HW1 Evaluation

HW1 Evaluation

- Install FreeBSD **30%**
- Update FreeBSD
  - Customize your kernel (Remove useless kernel config) **10%**
  - Change kernel IDENT **10%**
  - Enable your kernel with pf (Packet Filter) support **10%**
- Enable SSH Connection and Create a User for TA **10%**
  - Username: CSNA2016, Password: CSNA2016
  - SSH port 22
- Set Locale with UTF-8 for CSNA2016 **10%**
- Update Your Ports Tree and Install Vim **10%**
- Set Time Zone and Adjust Current Time **10%**
- Bonus
  - Set Quota for CSNA2016's Home Directory with 100MB **5%**

Announcement

- Register your server's public IP on moodle
- TA will access your server as a user (CSNA2016) and check all the requirements
- Due : 2016/**10/12 23:59**

- Any question, ask Google or TAs csna@imslab.org
- Useful references : FreeBSD Handbook

FreeBSD Installation

FreeBSD

1. Get CD image
   - download it here
   - Current Release: 10.3, 10.2, 10.1, 9.3
   - TA uses 10.3 in this tutorial
2. Boot from the image
   - Directly use the image if you're going to install FreeBSD on a VM
   - Burn it into a CD if you're going to install FreeBSD on a PC
3. FreeBSD system installer
4. FreeBSD system configuration

FreeBSD

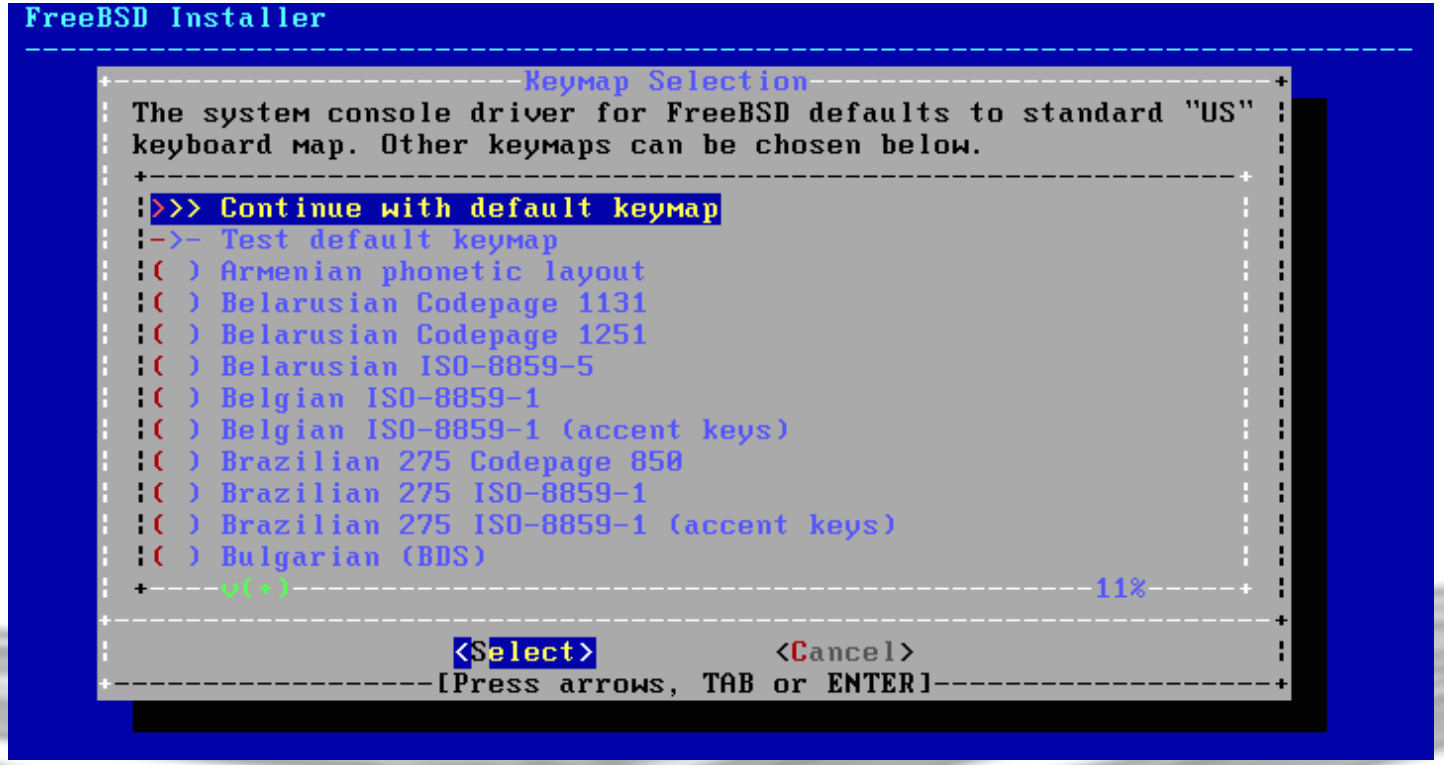
- Press **Enter** to boot up in multi user mode
- The following steps are just an example. You can make any changes to suit your needs

FreeBSD

- Install

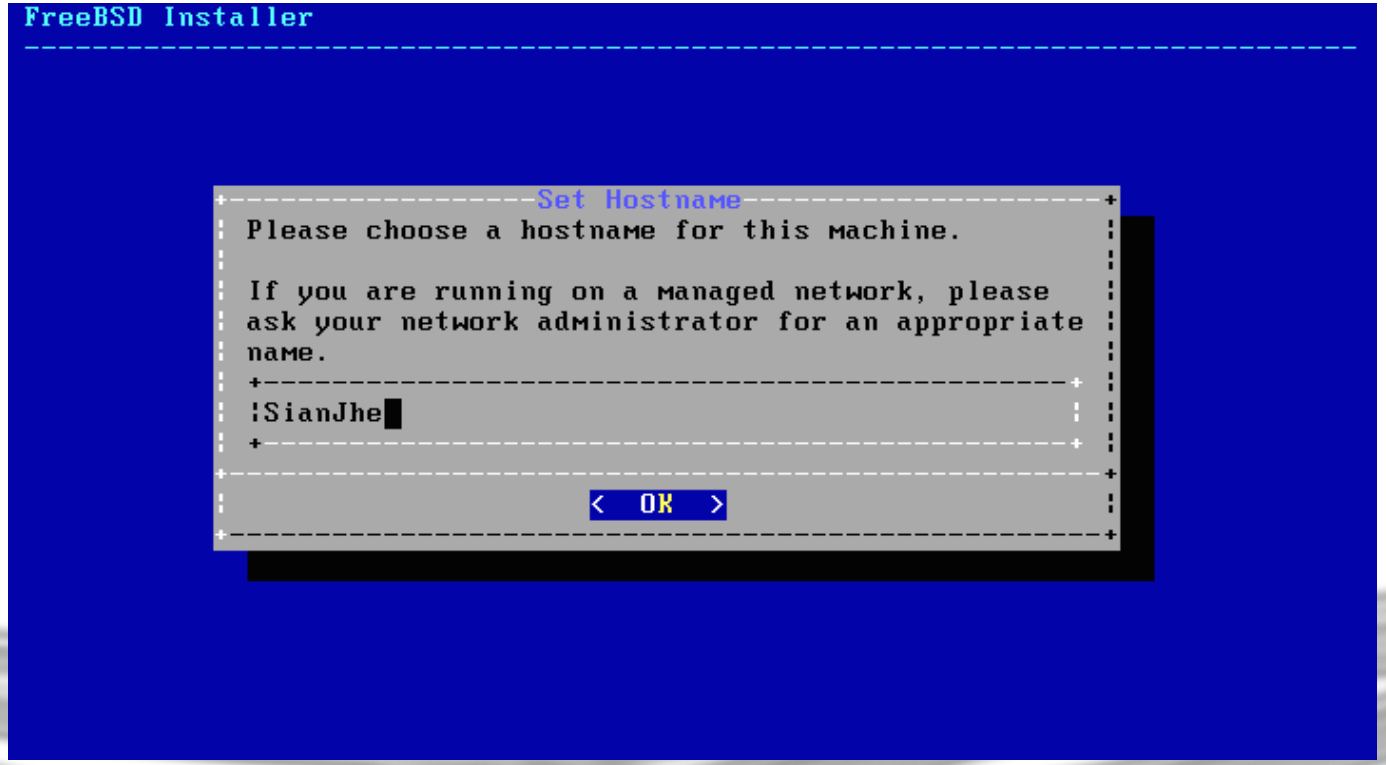
FreeBSD

- Use default keymap



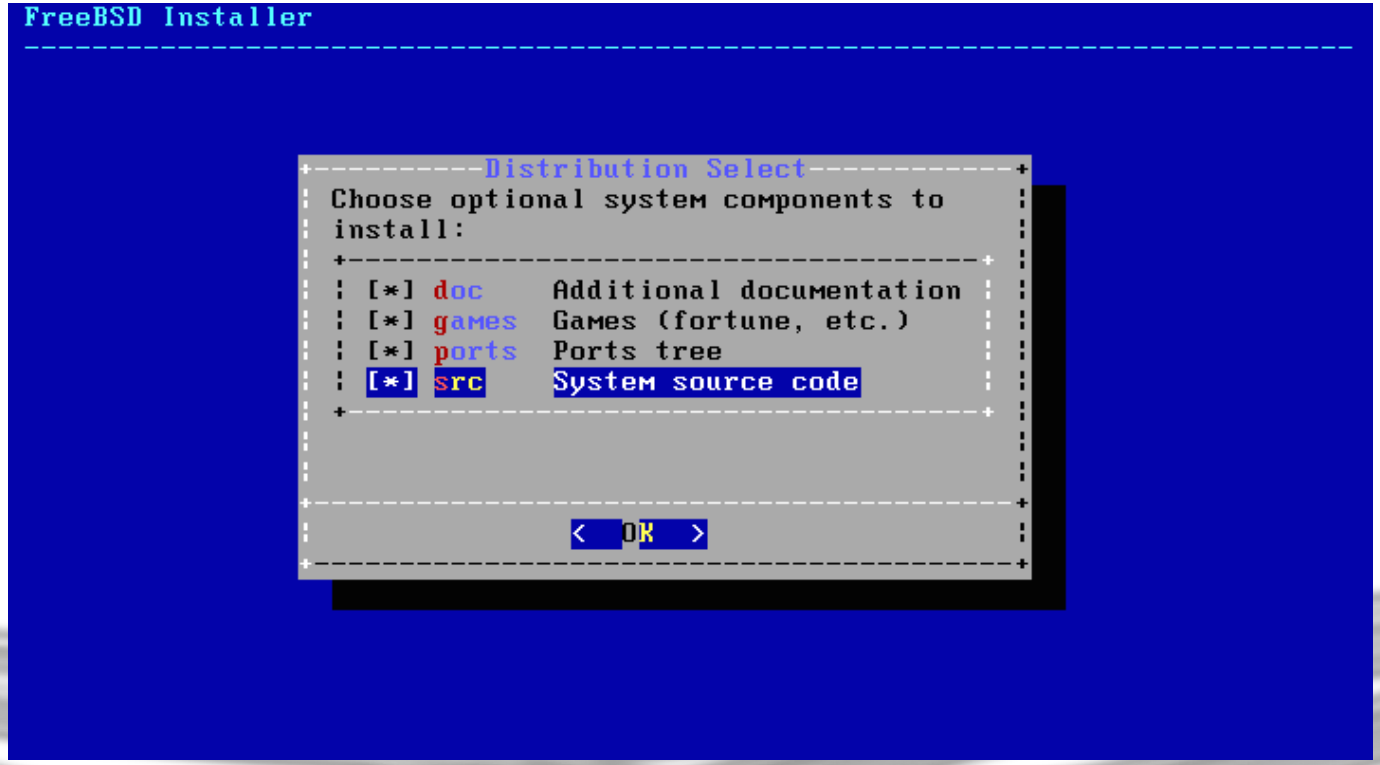
FreeBSD

- Choose a hostname for your machine



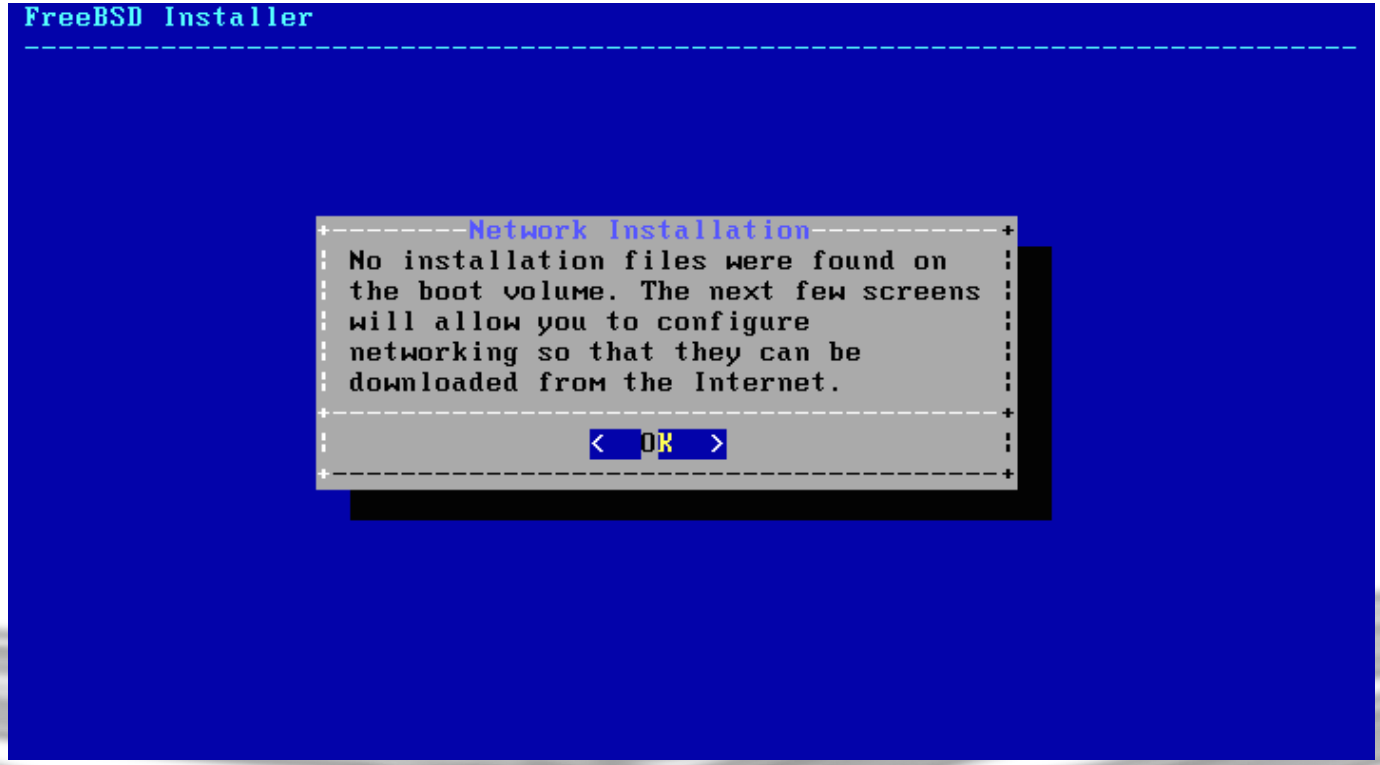
FreeBSD

- We're going to use some source codes under `/src` and ports tree



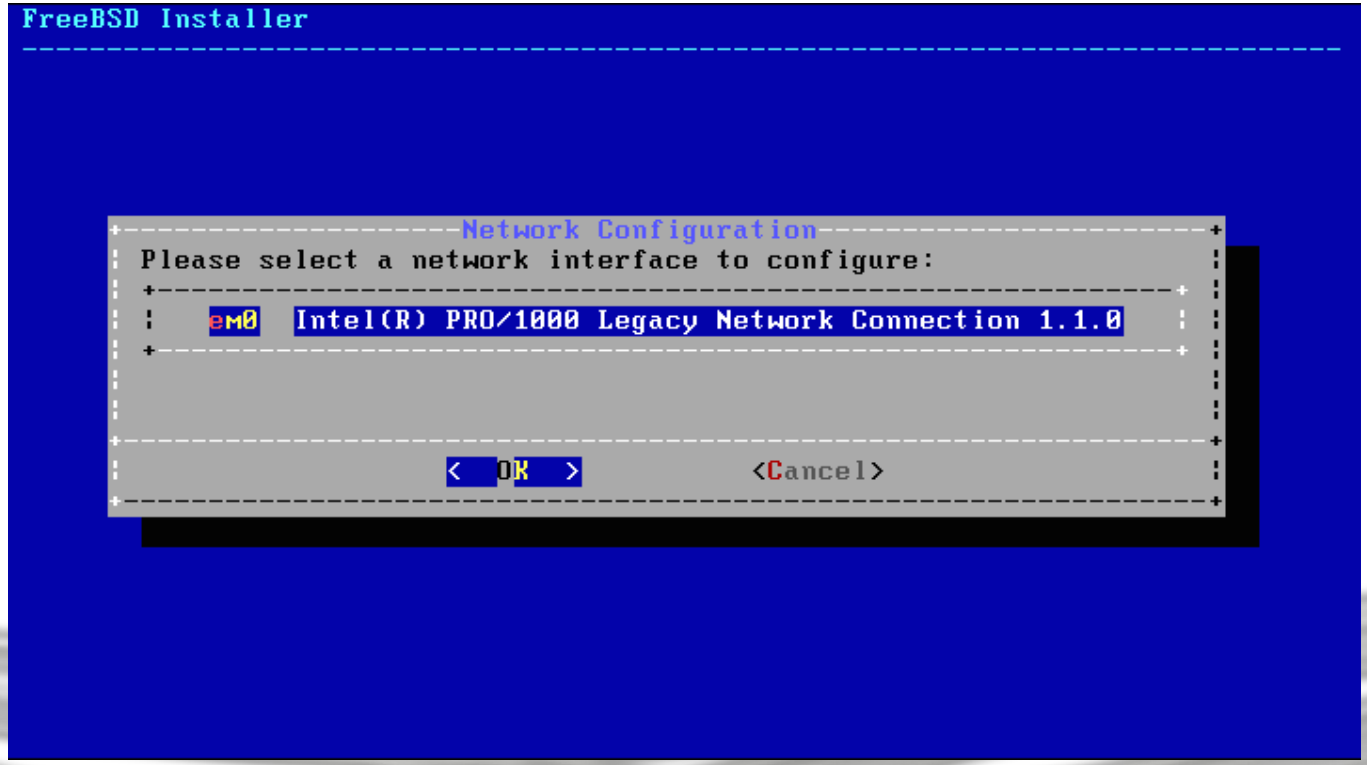
FreeBSD

- OK


FreeBSD Installer
Network Installation
No installation files were found on
the boot volume. The next few screens
will allow you to configure
networking so that they can be
downloaded from the Internet.
< OK >

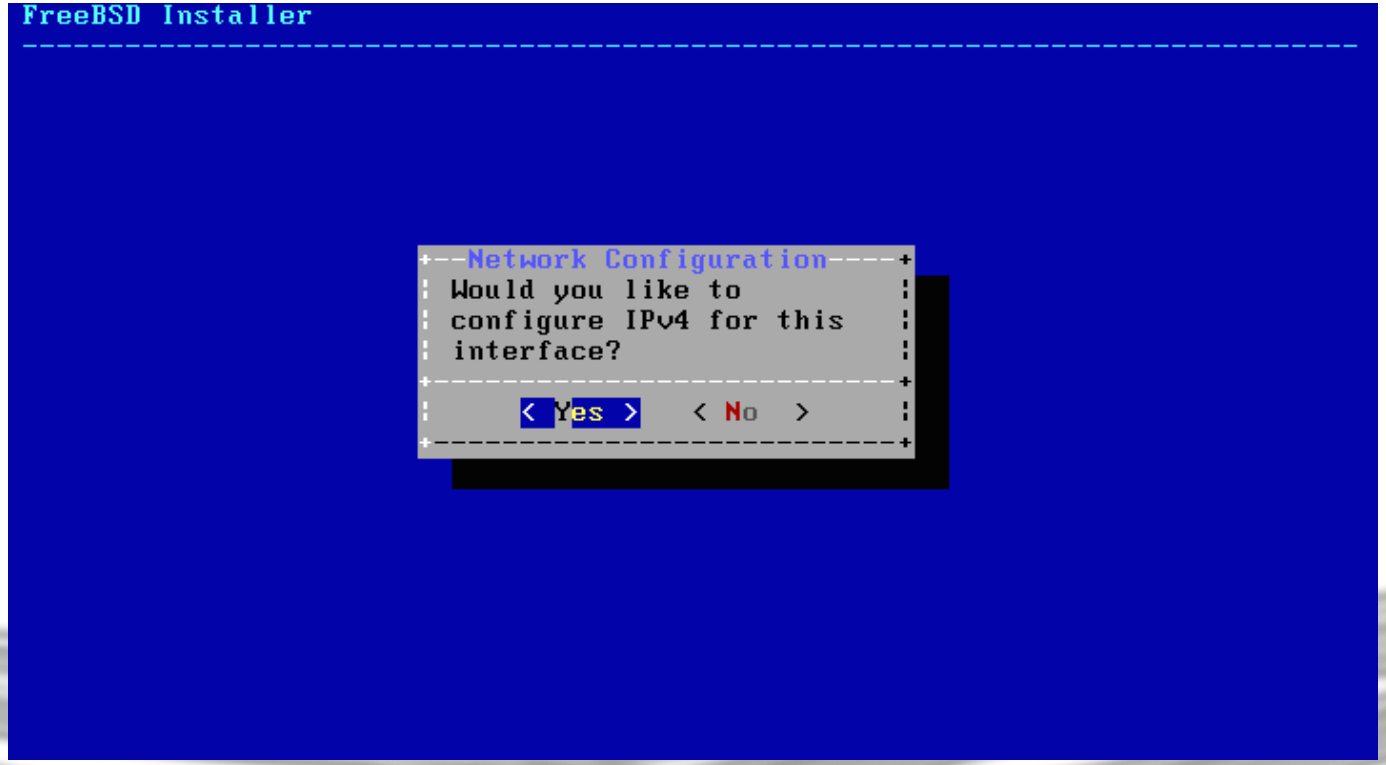
FreeBSD

- Configure network interface



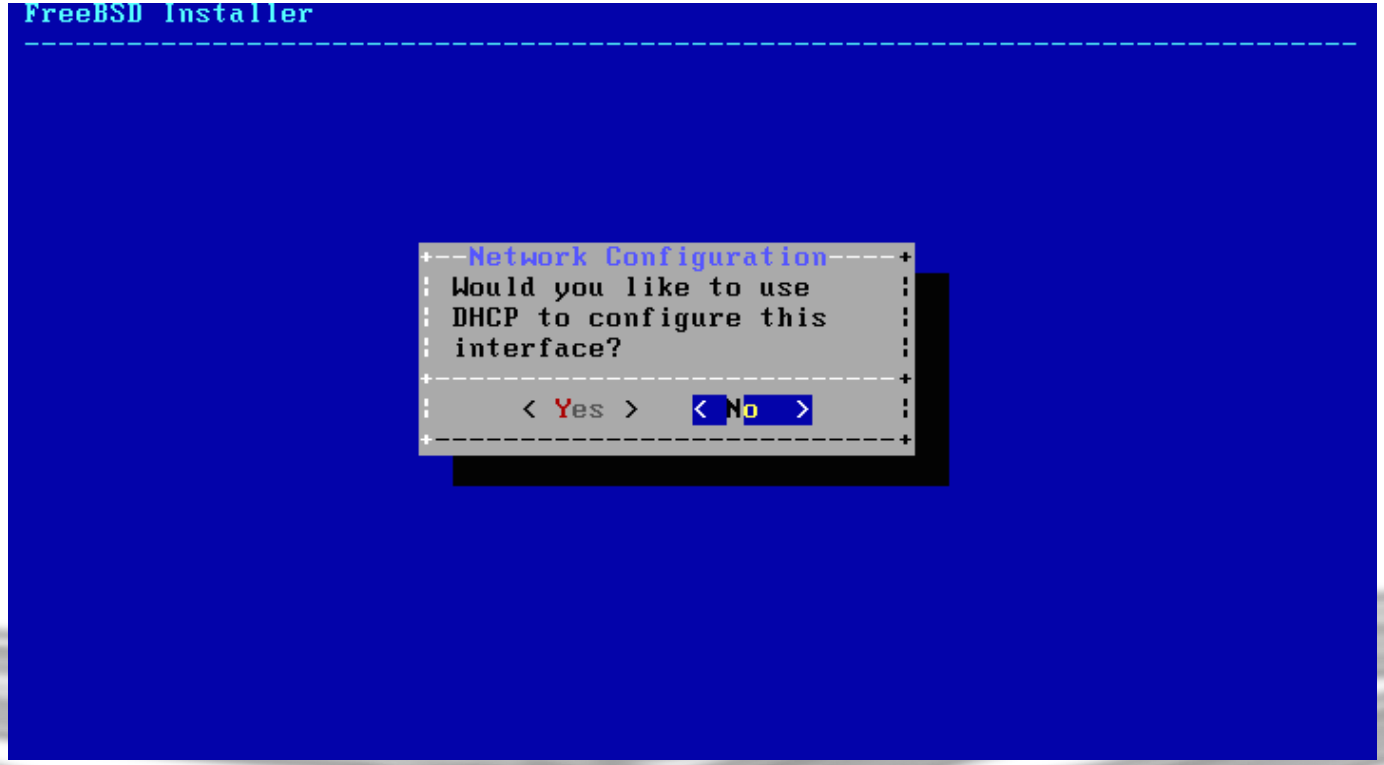
FreeBSD

- Configure IPv4 now, or change this configuration after installation



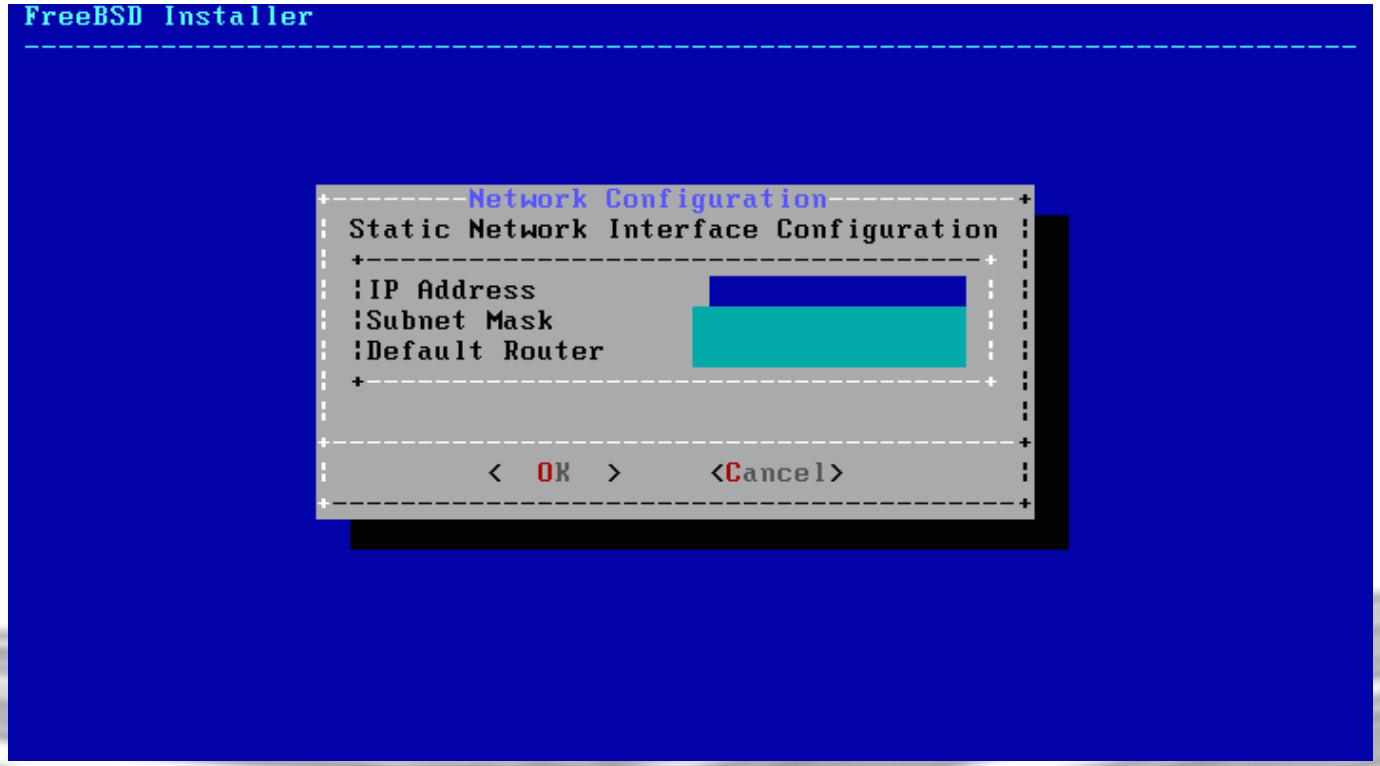
FreeBSD

- We're going to assign a public IP for it instead of using DHCP unless your DHCP server distributes public IP, e.g. dormitory network



FreeBSD

- Give it a public IP
- Mask can be hexadecimal 0xffffff00 or IPv4 format 255.255.255.0

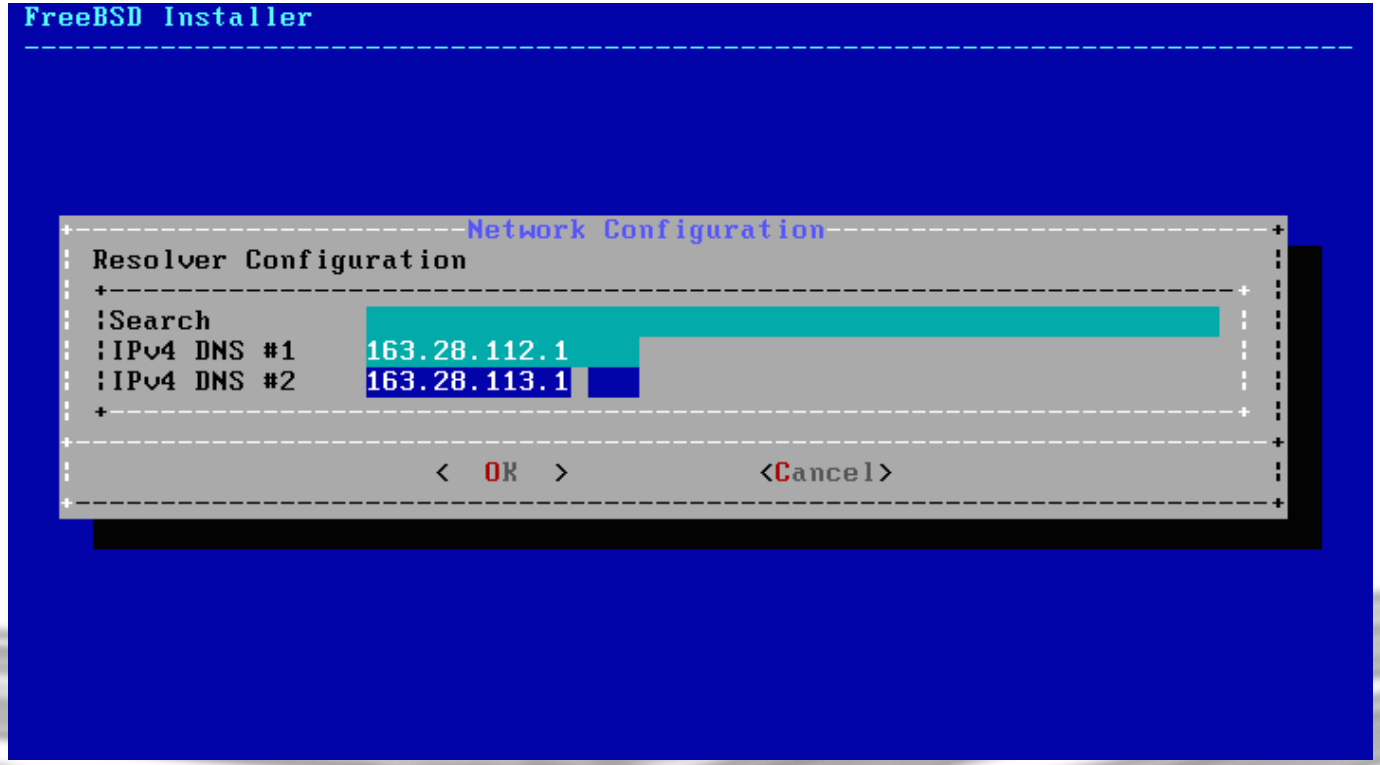


FreeBSD

- You decide

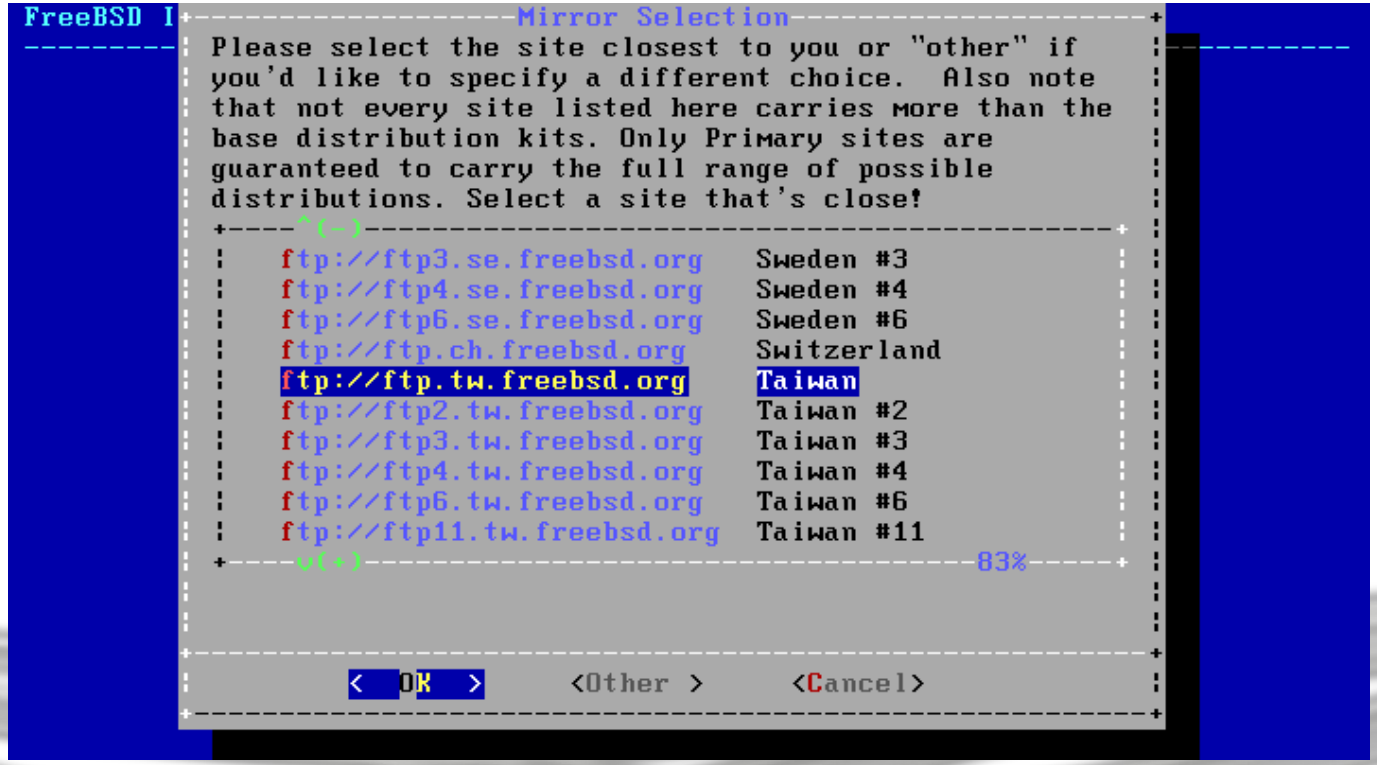
FreeBSD

- We can use NCKU's DNS servers or Google's 8.8.8.8



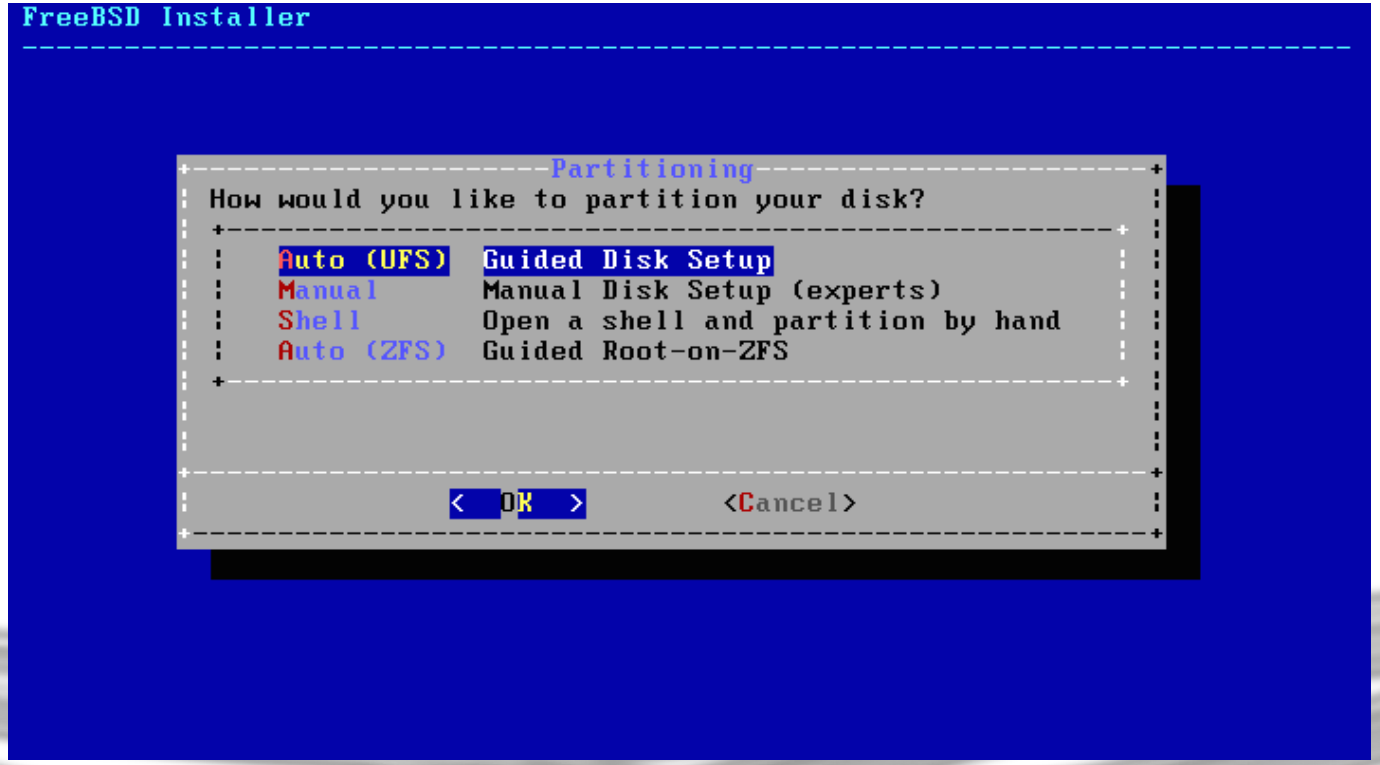
FreeBSD

- Find nearest site for mirror



FreeBSD

- Auto partition as Unix File System is simpler for beginners

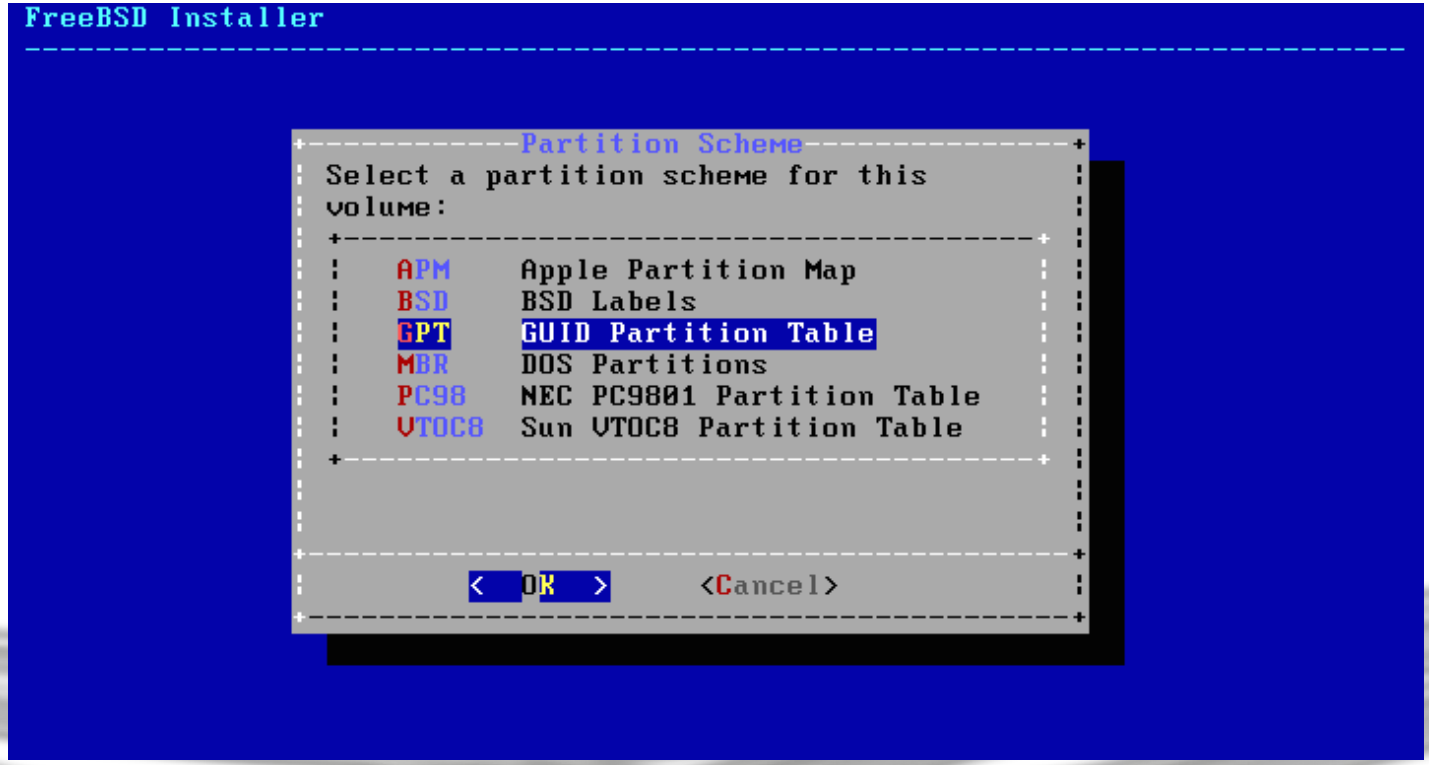


FreeBSD

FreeBSD Installer
Partition
Would you like to use this entire disk
(ada0) for FreeBSD or partition it to
share it with other operating systems?
Using the entire disk will erase any
data currently stored there.
<Entire Disk>
< Partition >

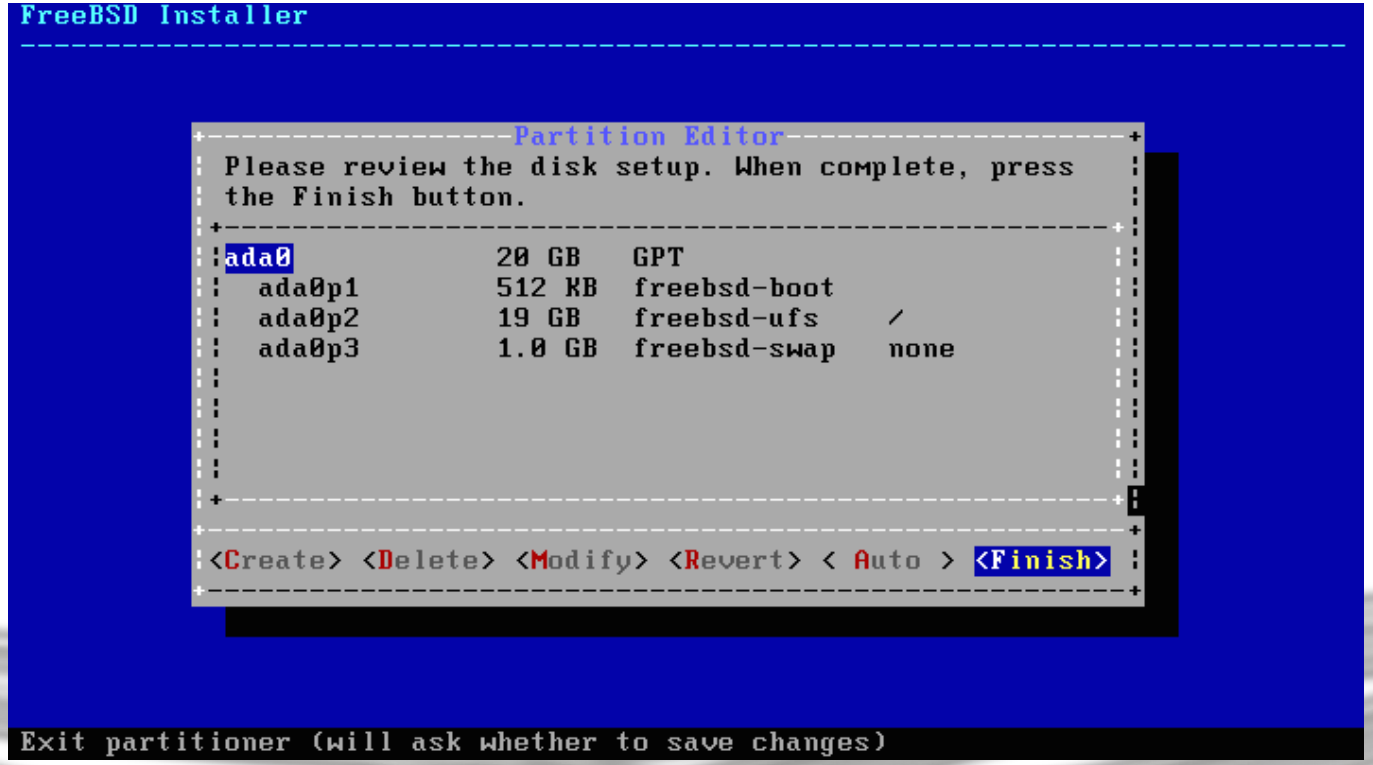
FreeBSD

- GPT (Globally Unique Identifier Partition Table)



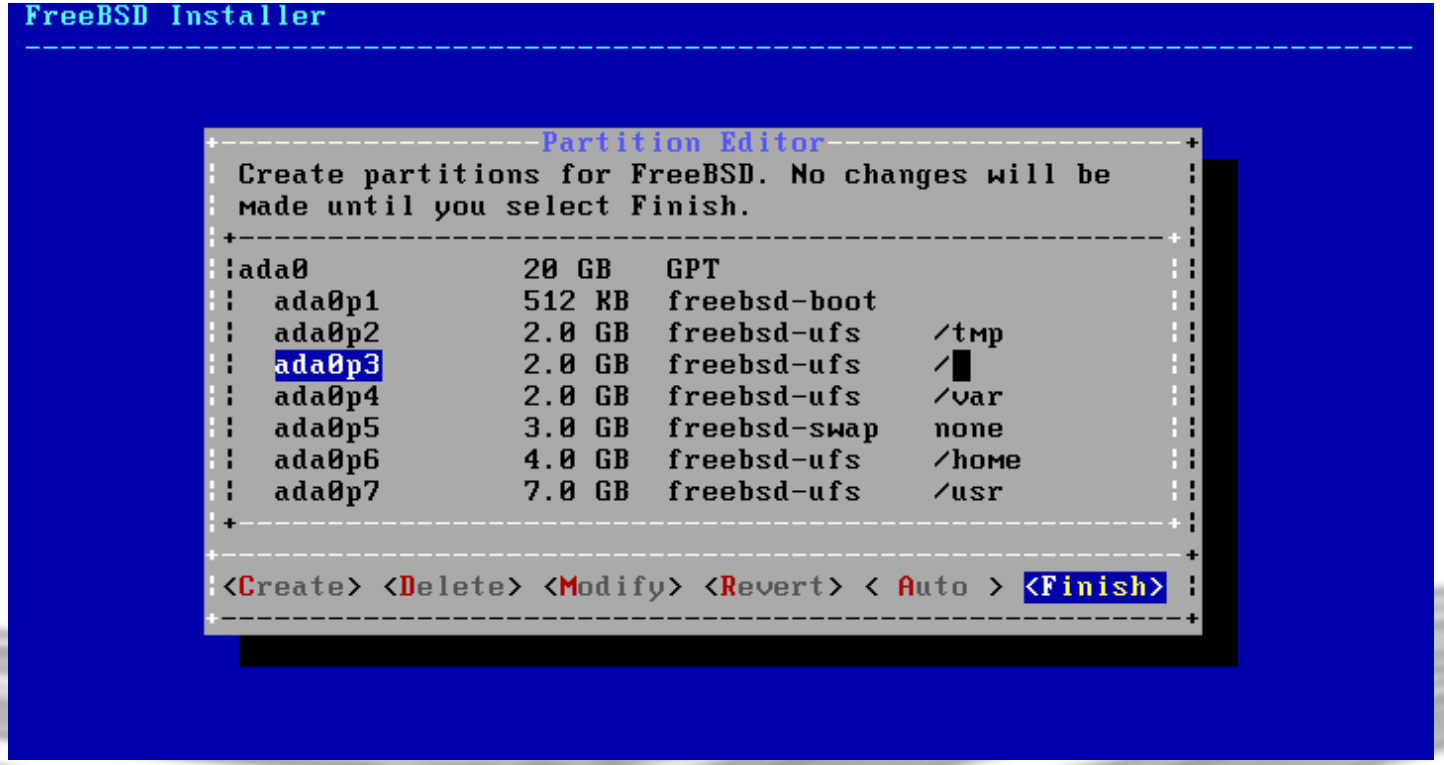
FreeBSD

- default

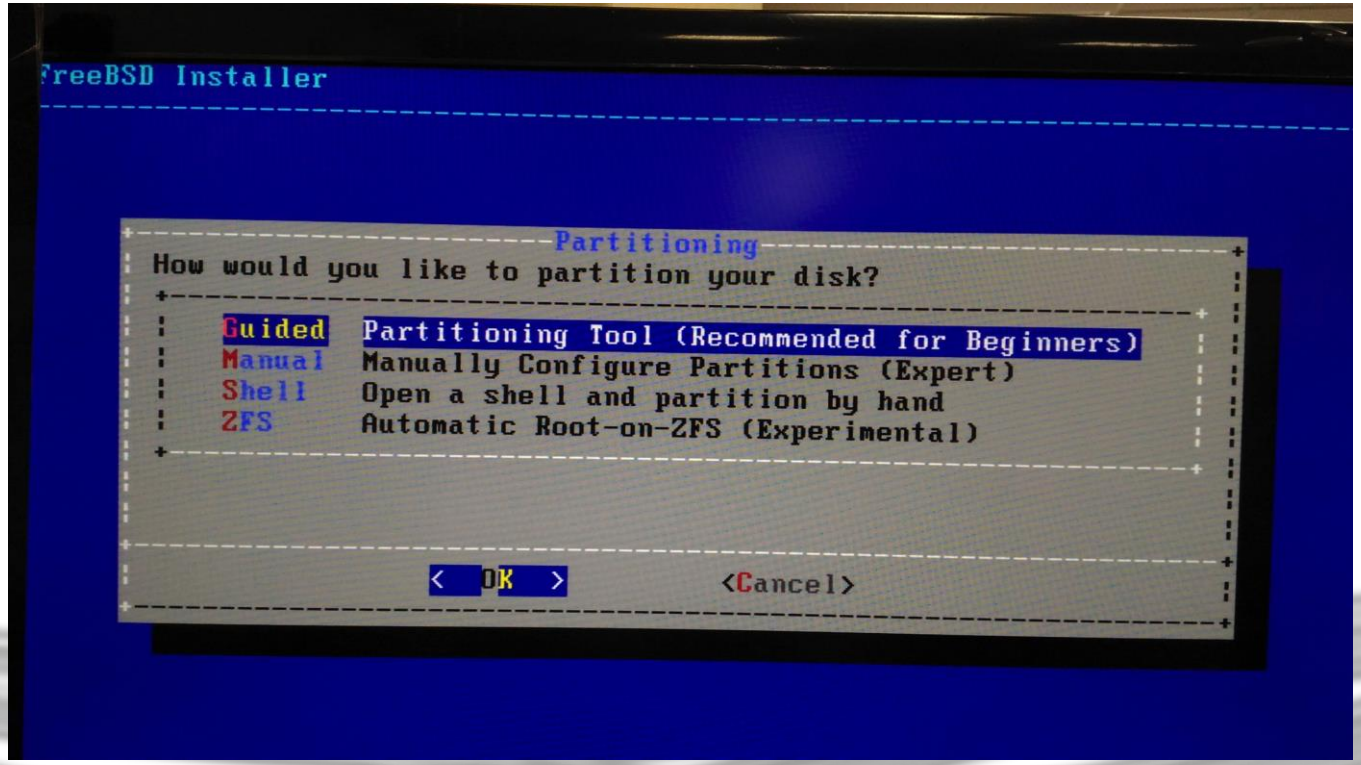


FreeBSD

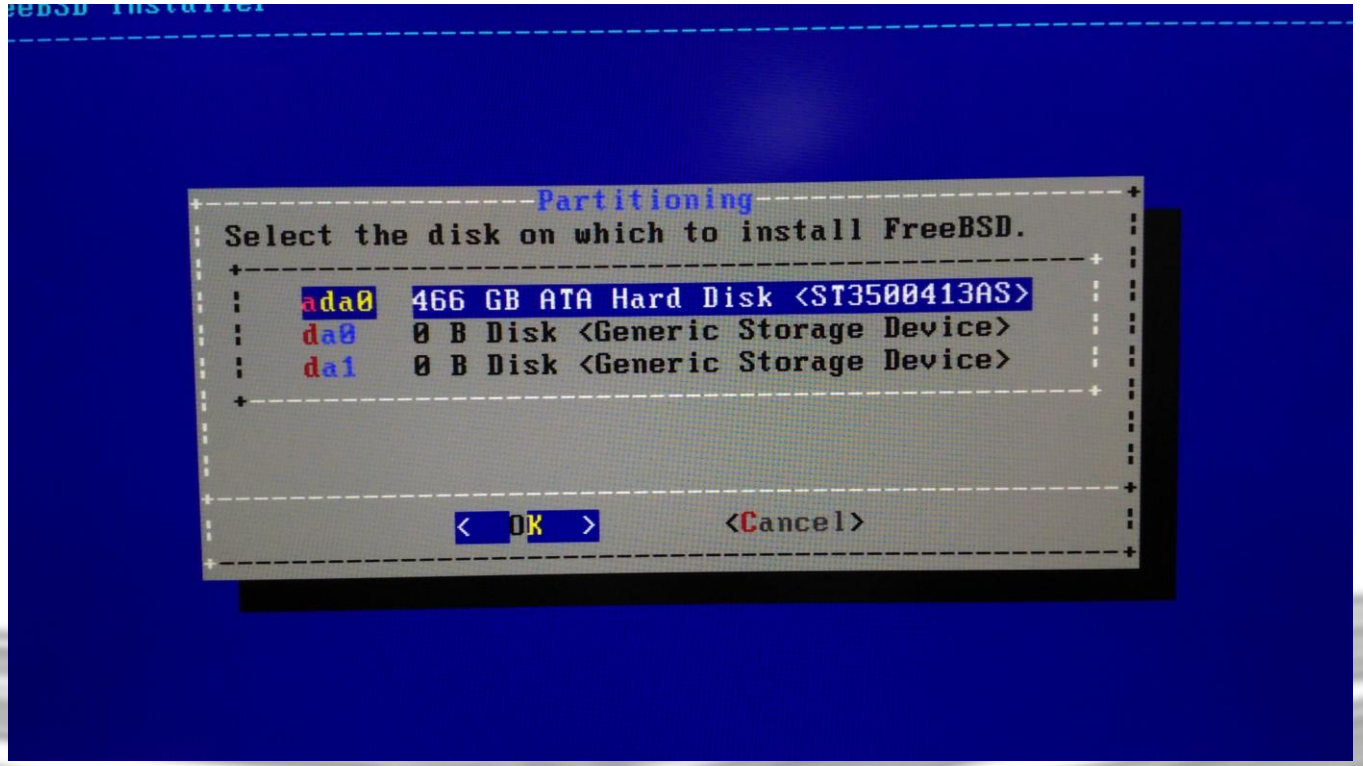
- or manual example



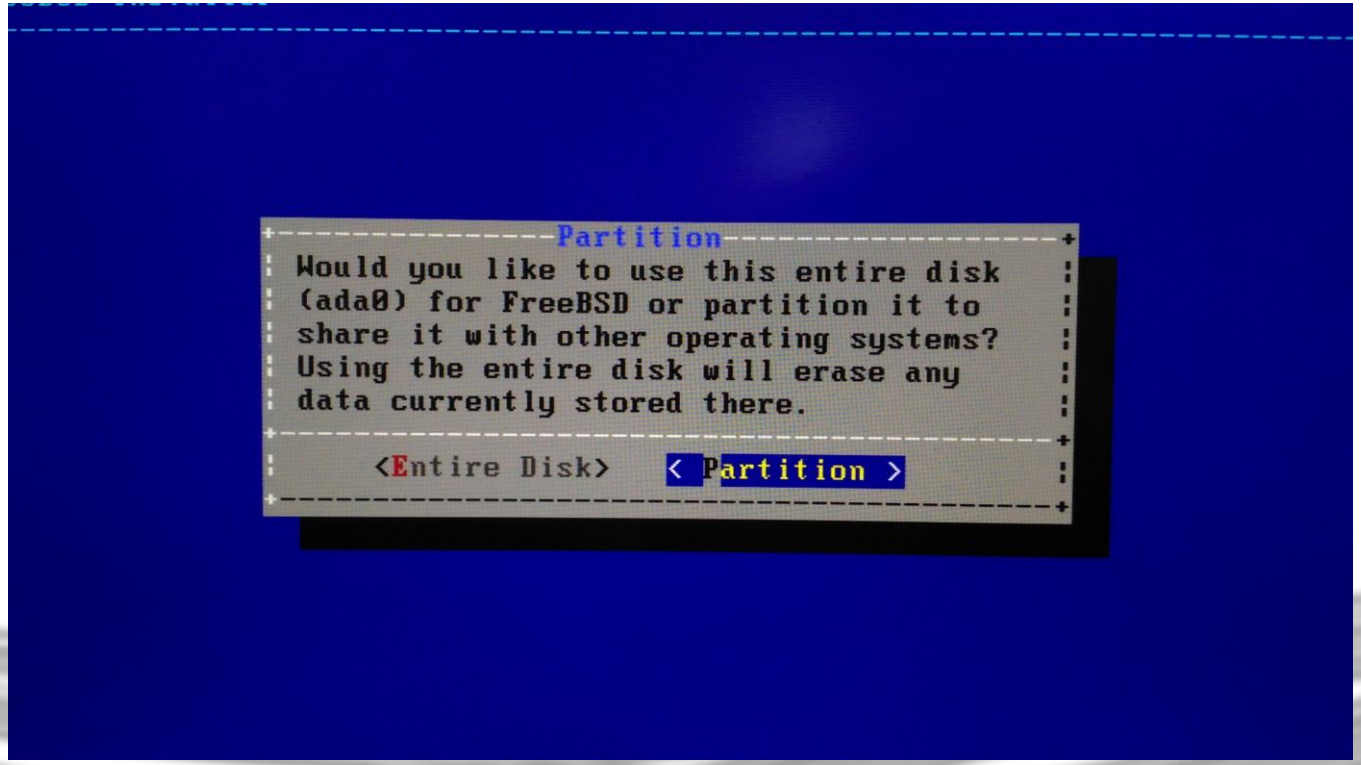
FreeBSD - Install On a PC example



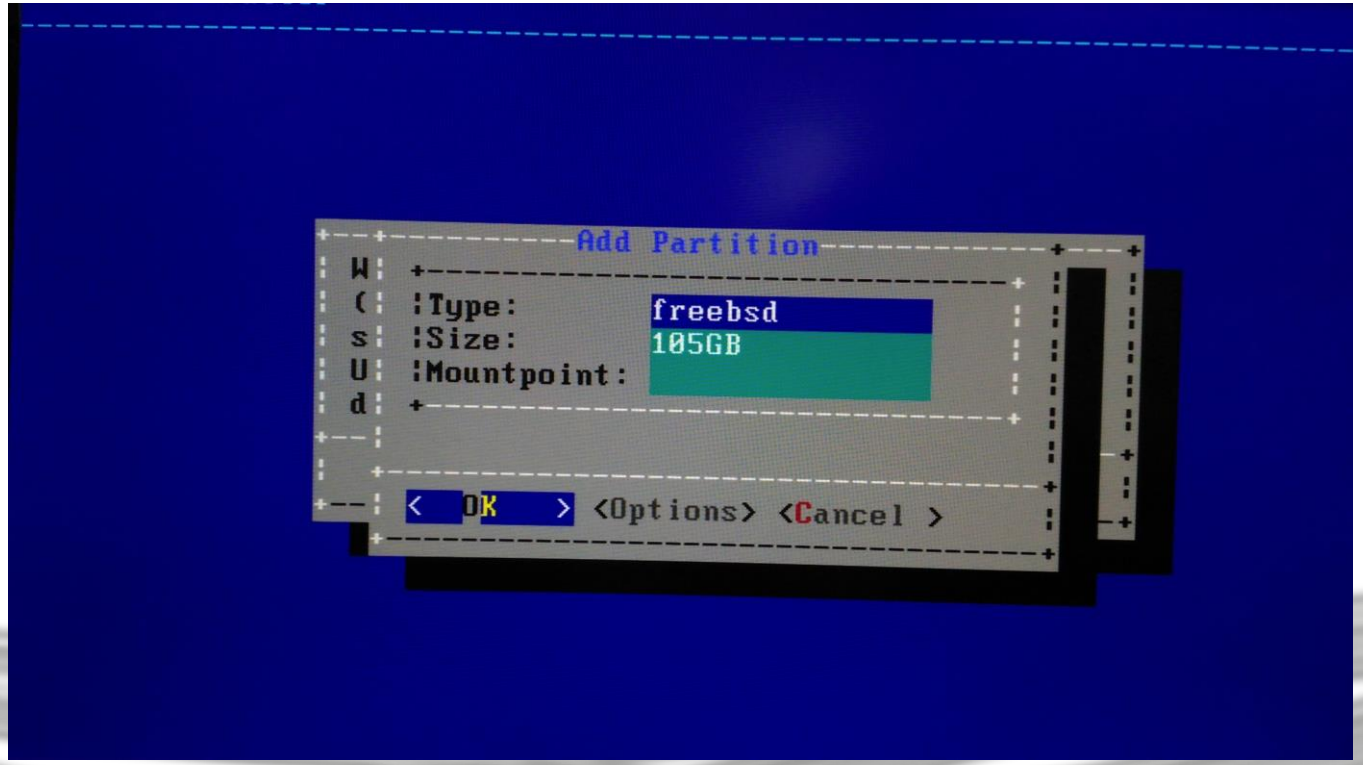
FreeBSD - Install On a PC example



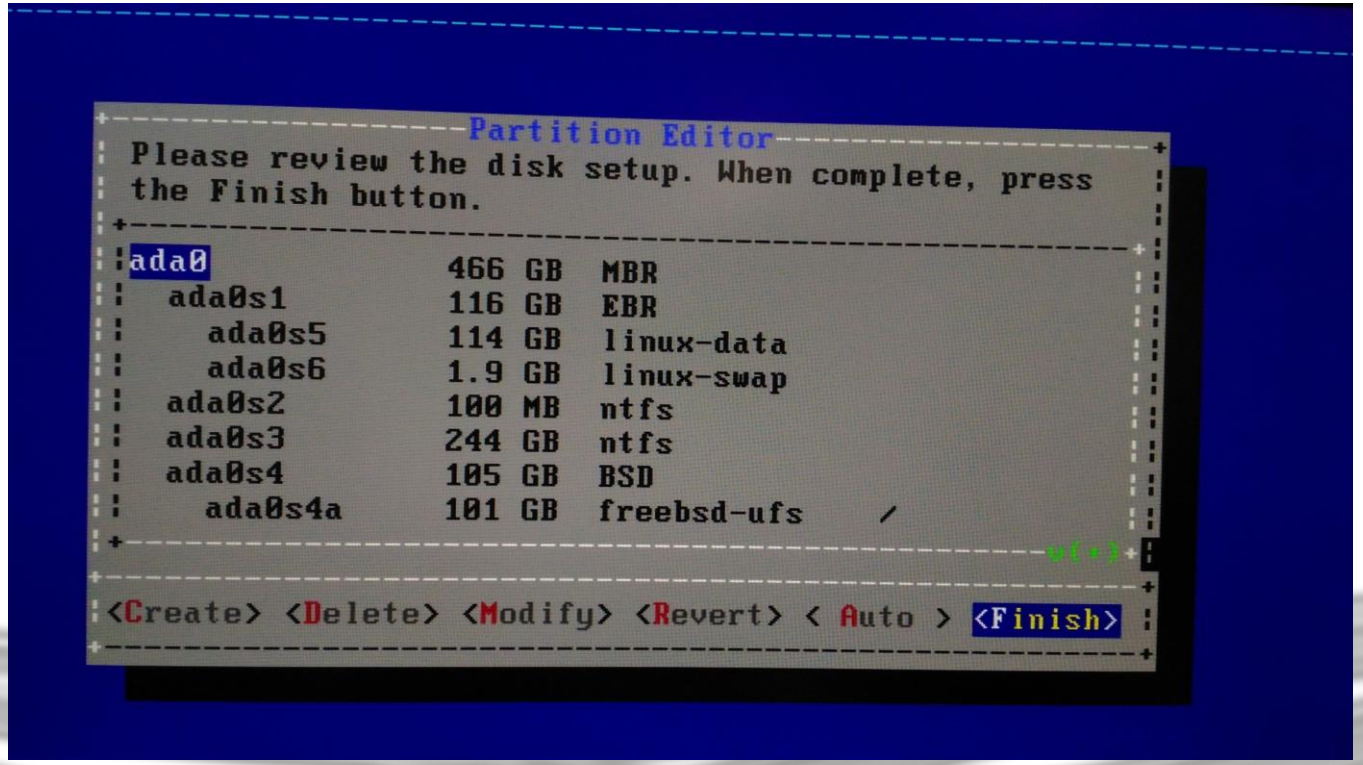
FreeBSD - Install On a PC example



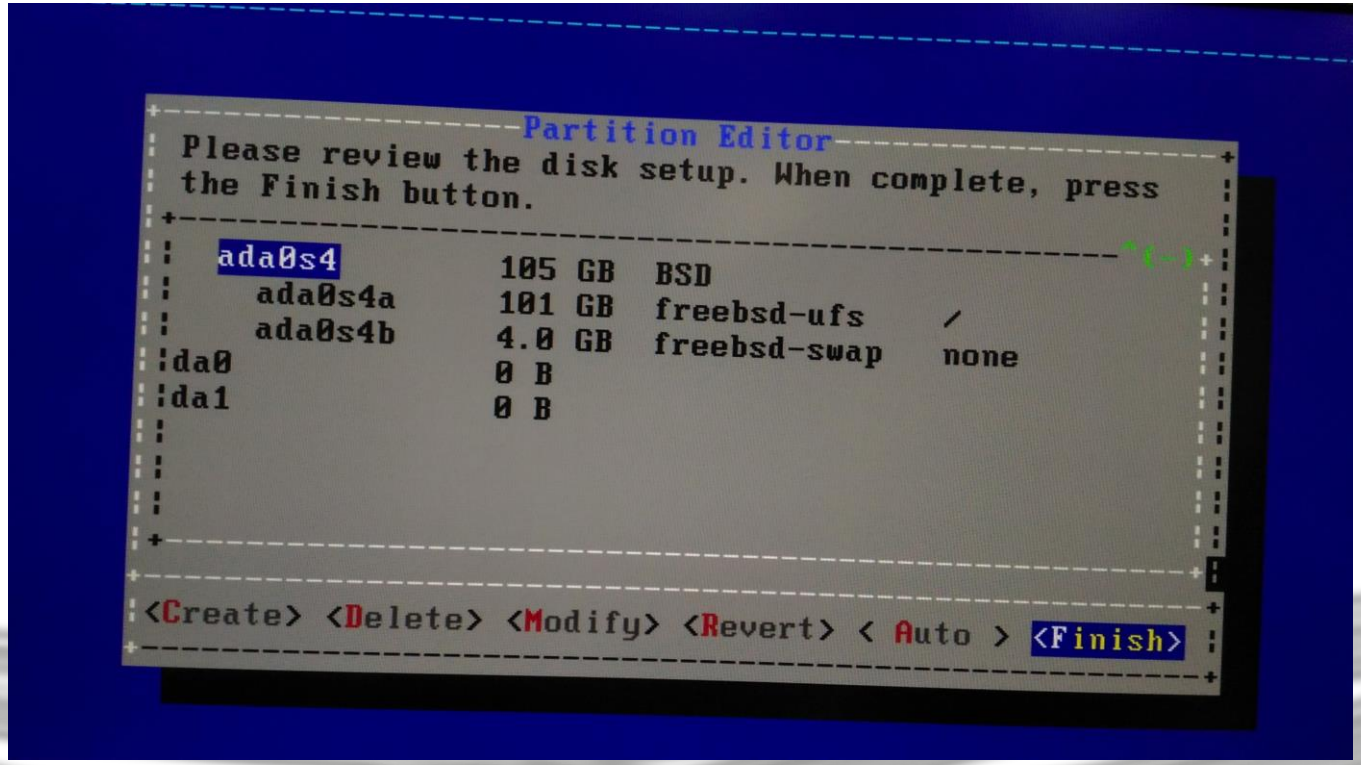
FreeBSD - Install On a PC example



FreeBSD - Install On a PC example

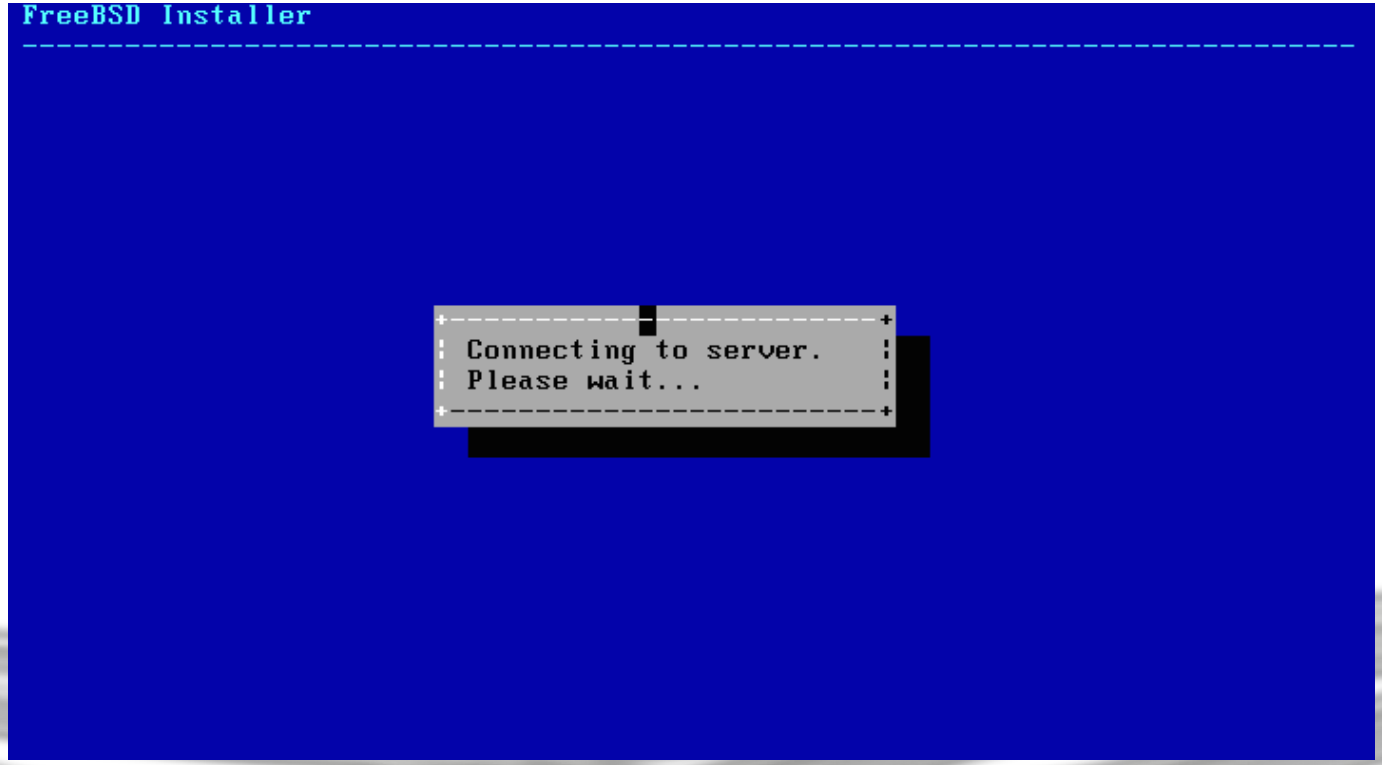


FreeBSD - Install On a PC example



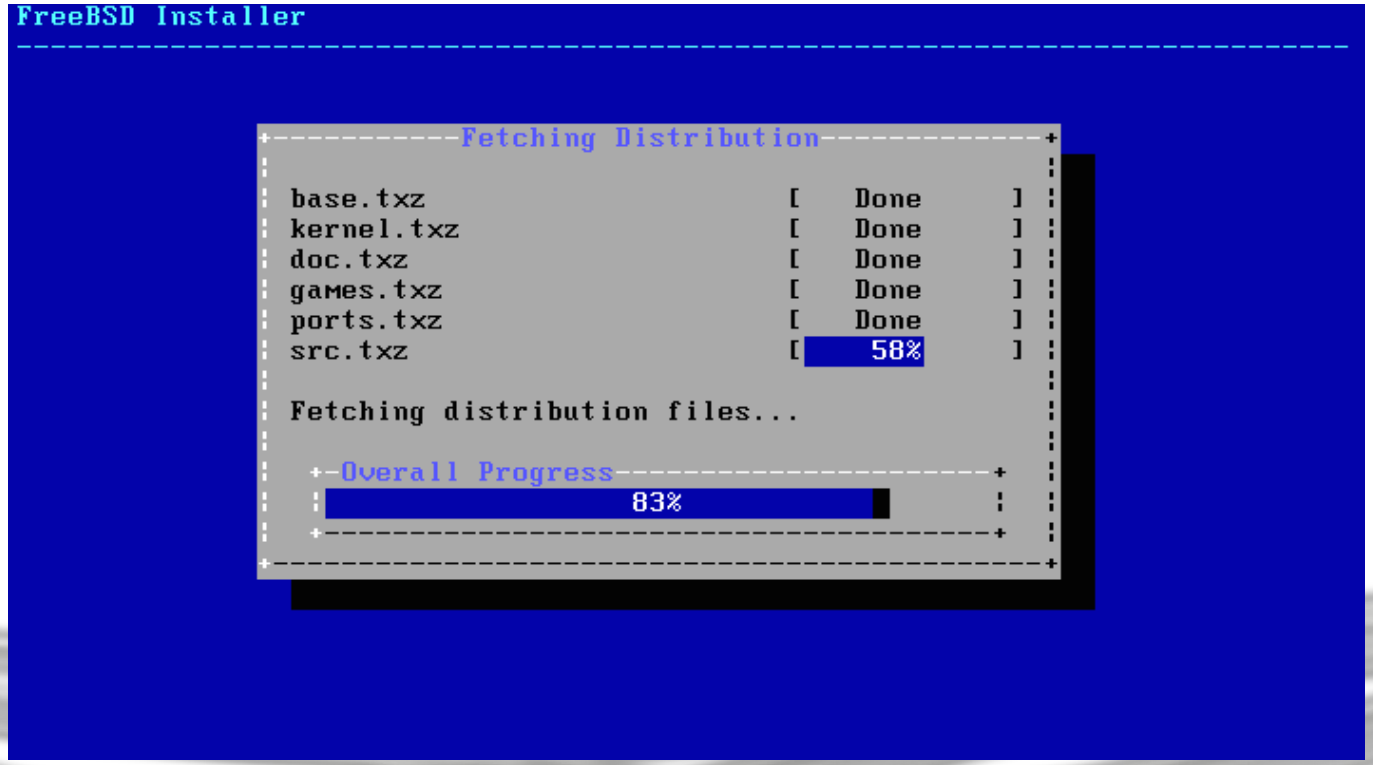
FreeBSD

- Connecting to server…



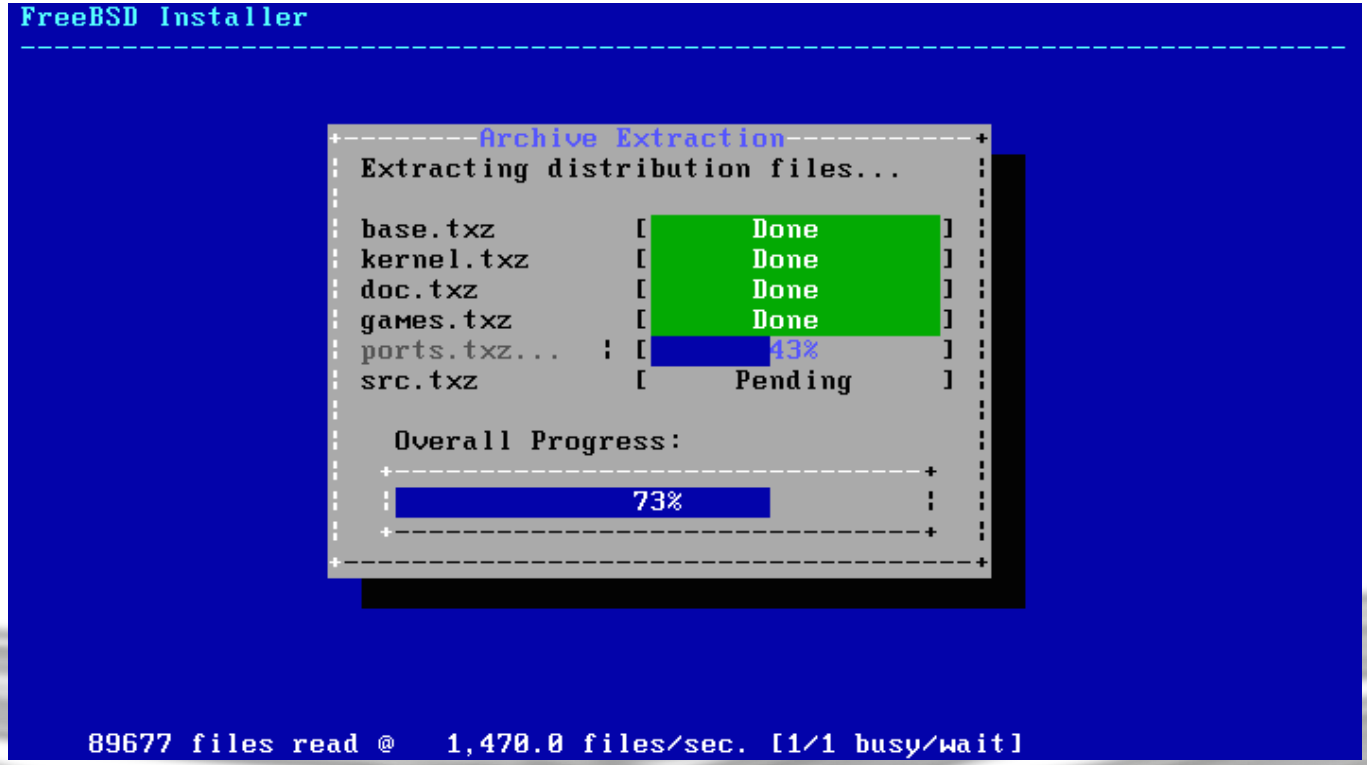
FreeBSD

- Installing…



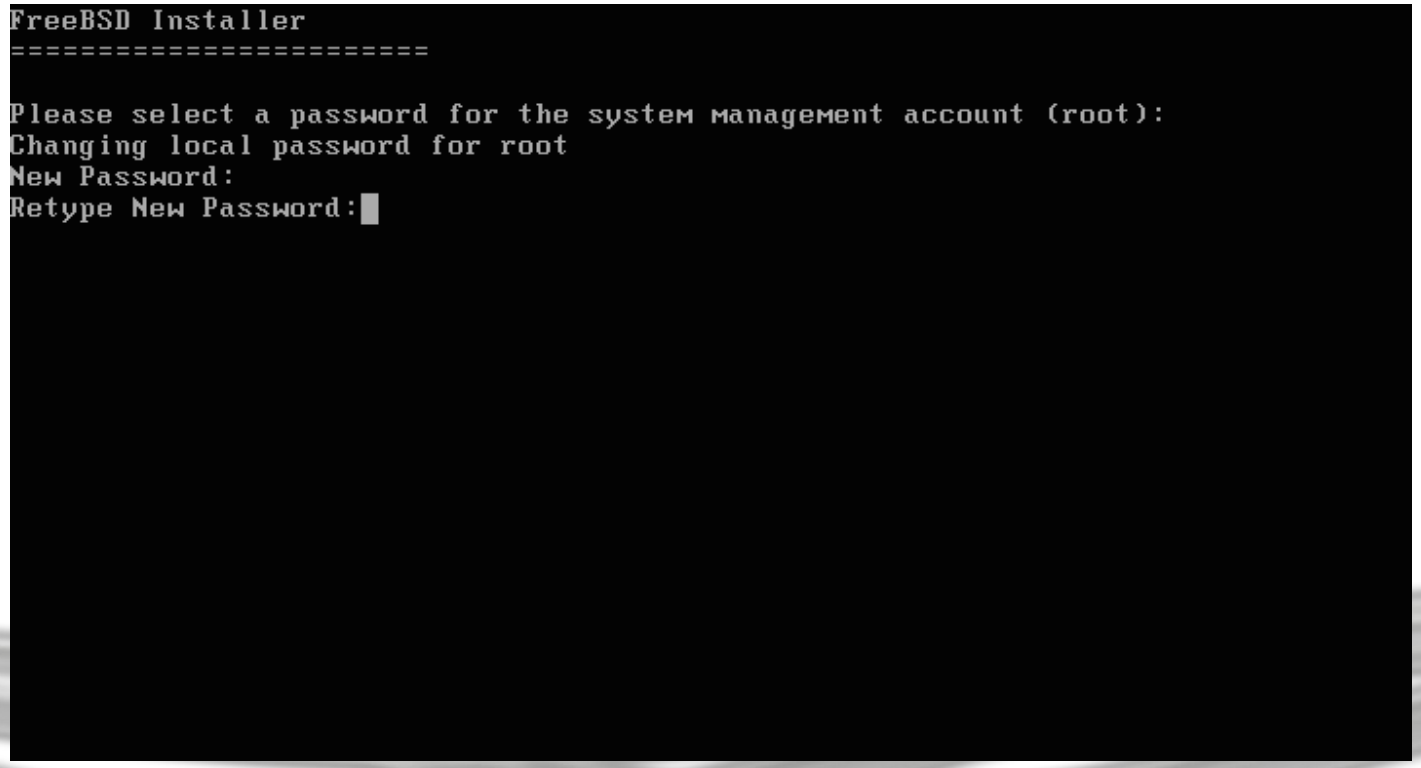
FreeBSD

- Wait a few minutes…



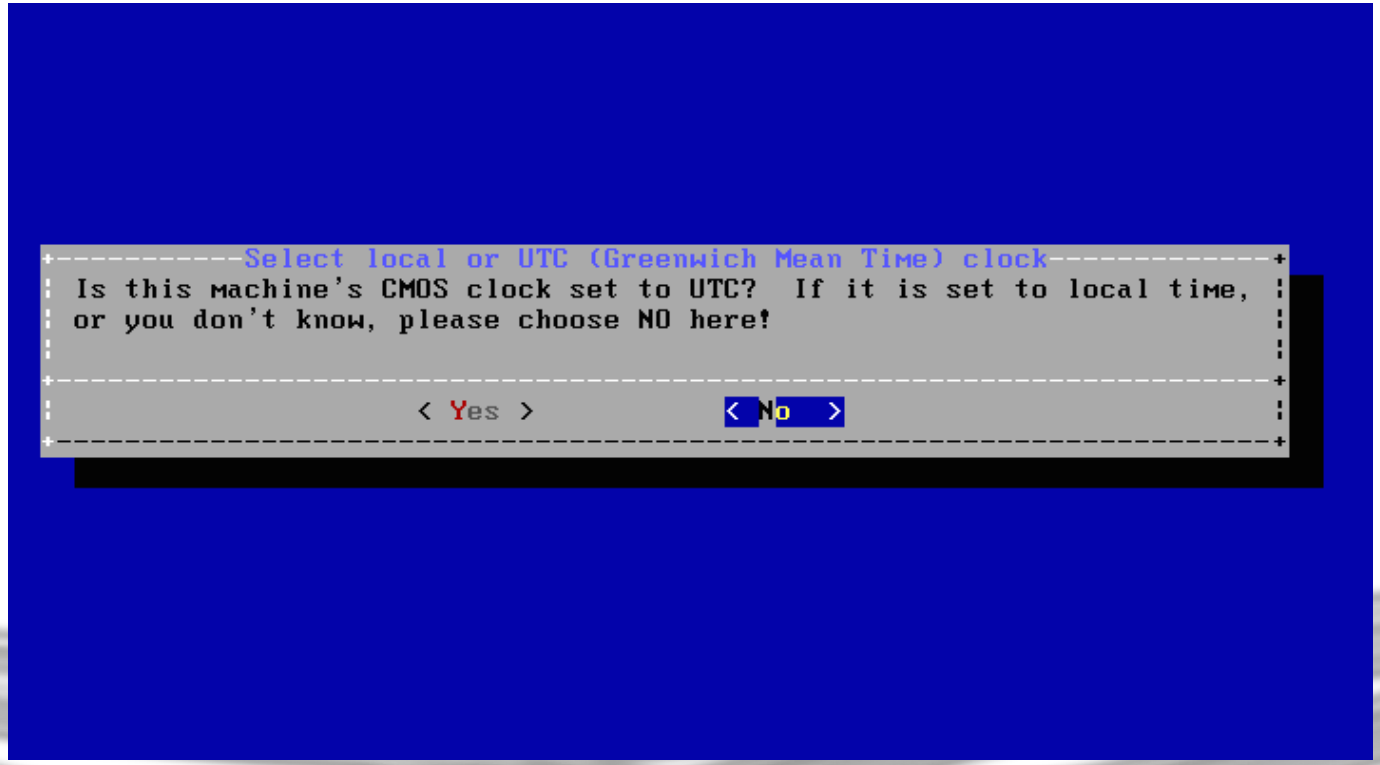
FreeBSD

- Set password for root



FreeBSD

- If you want to use local time instead of UTC, choose NO



FreeBSD

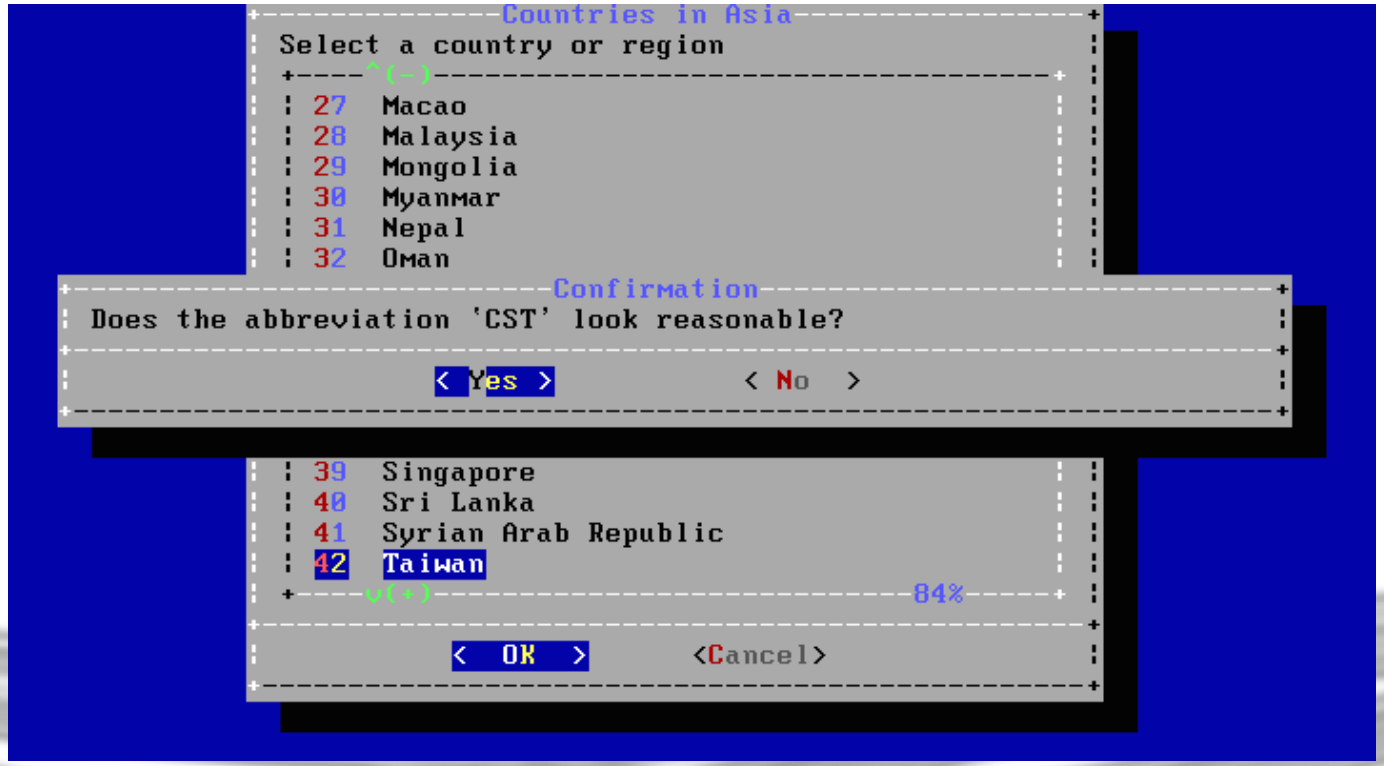
- Asia

FreeBSD

- Lovely Taiwan

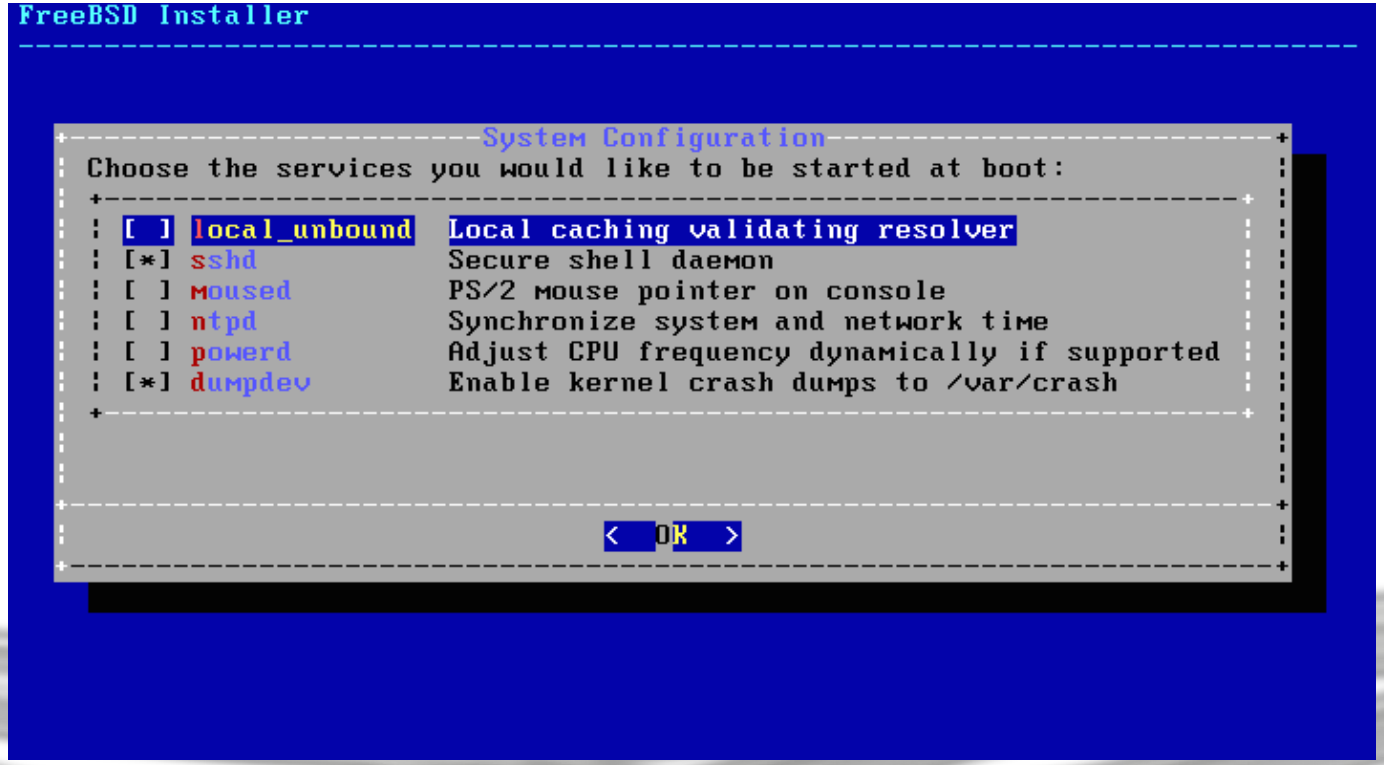
FreeBSD

- CST (Central Standard Time), hell yeah



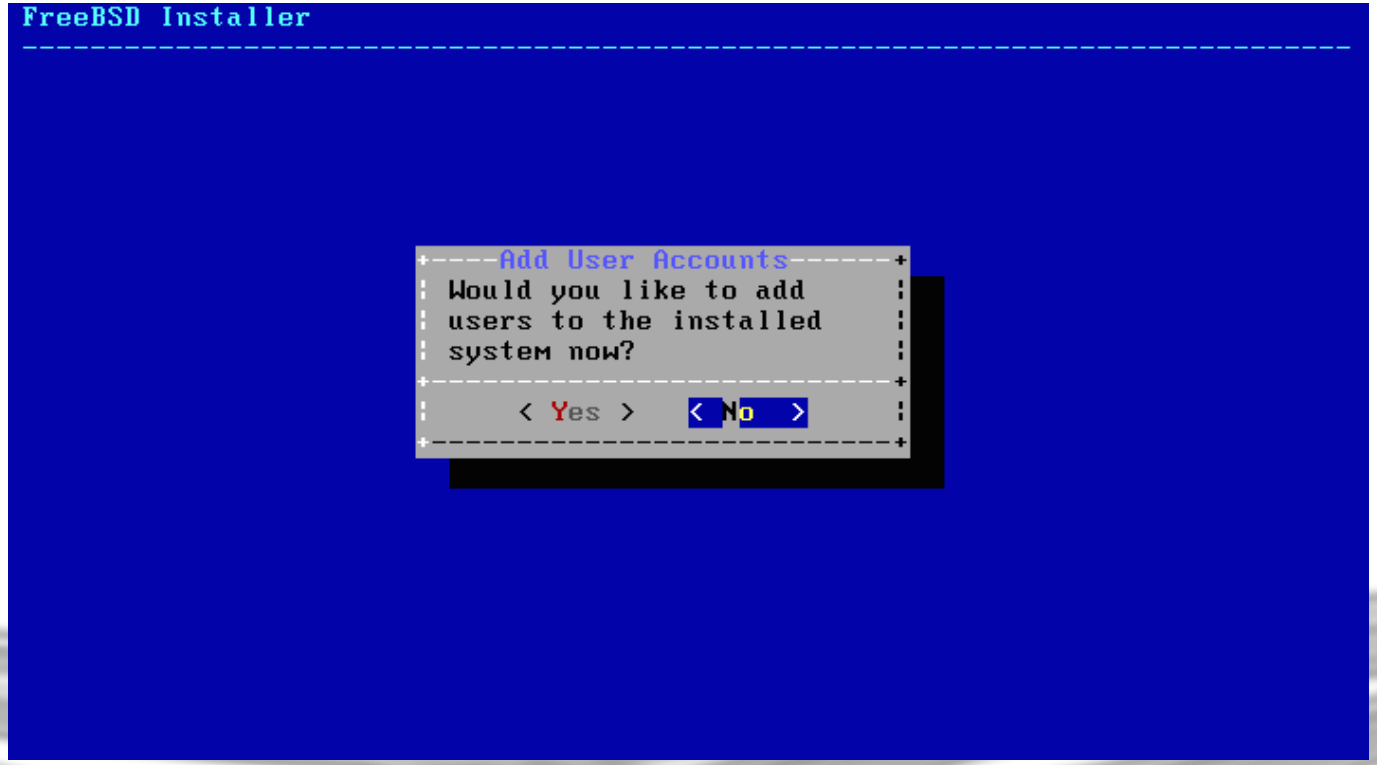
FreeBSD

- sshd seems nice



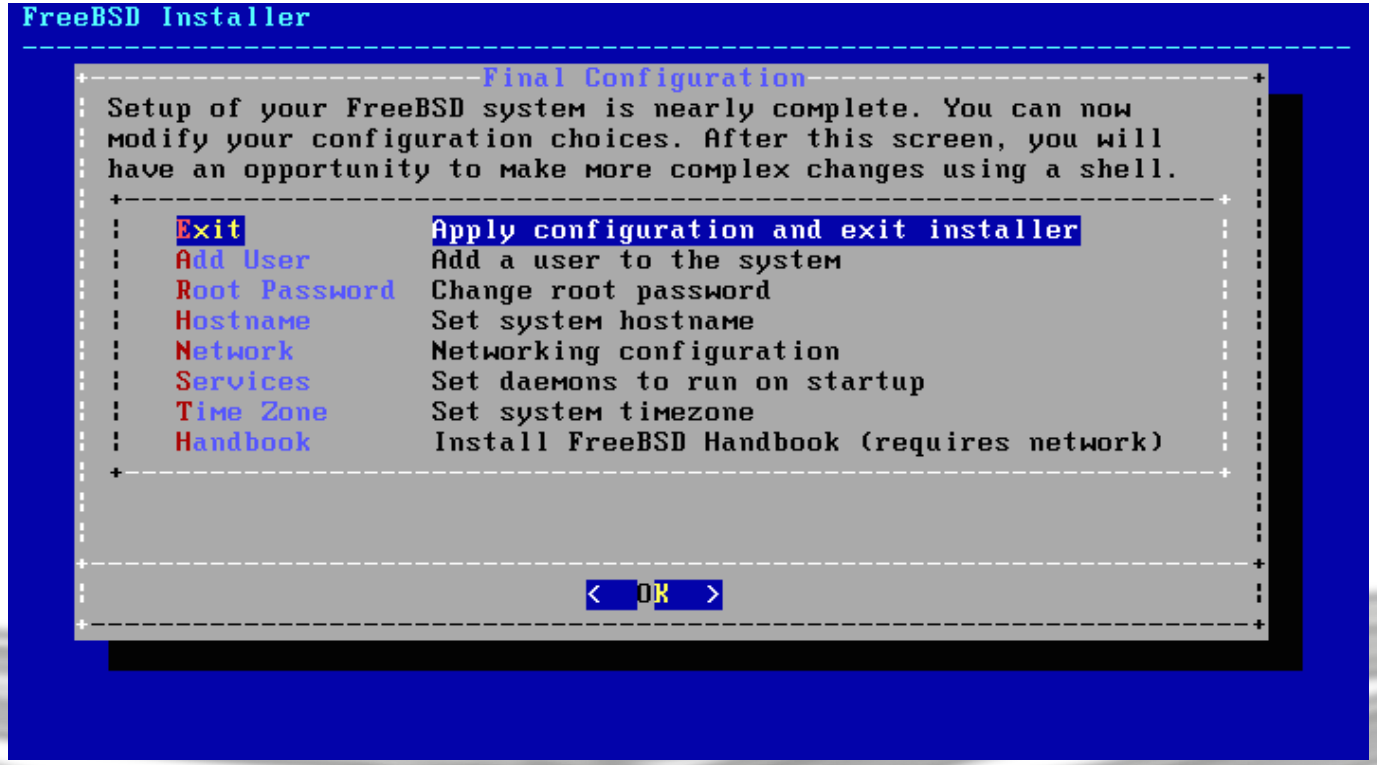
FreeBSD

- We can add user later. Your call



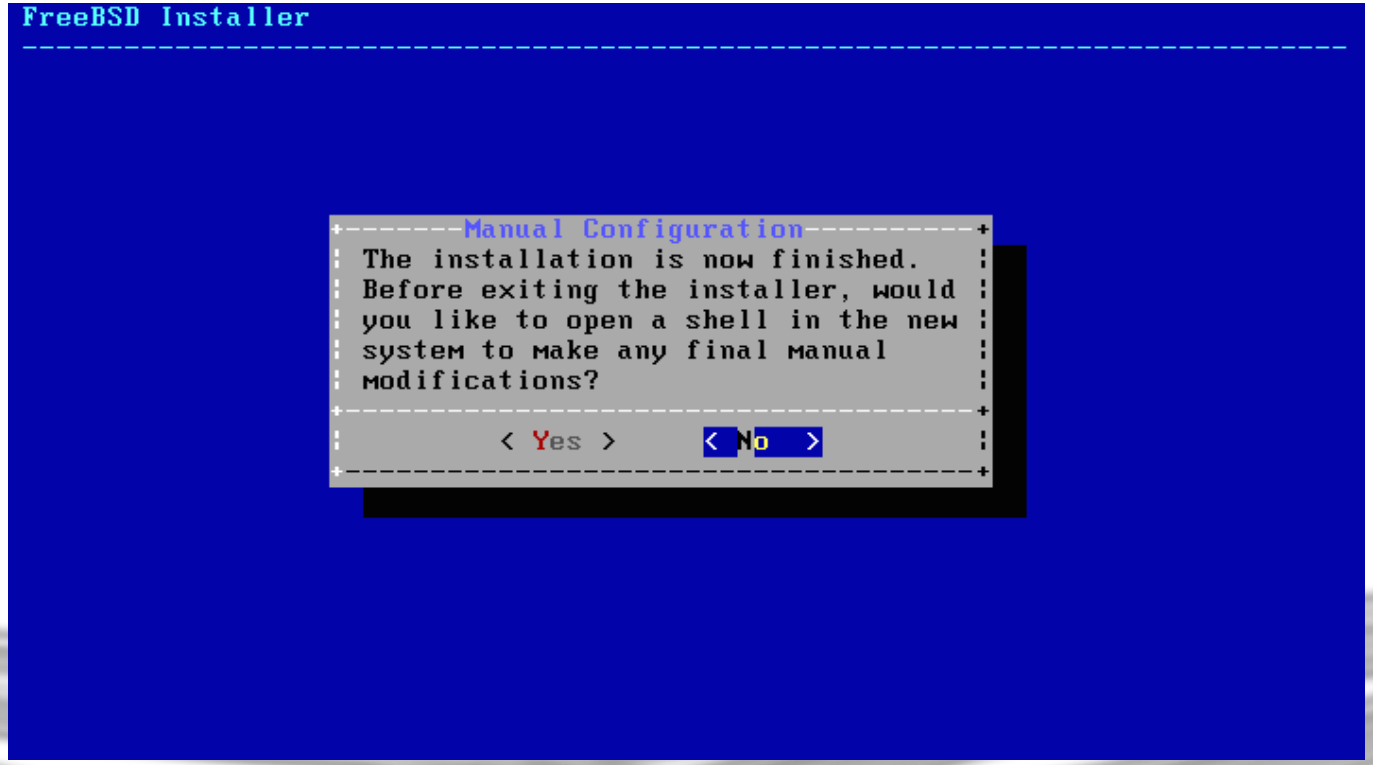
FreeBSD

- Almost there…



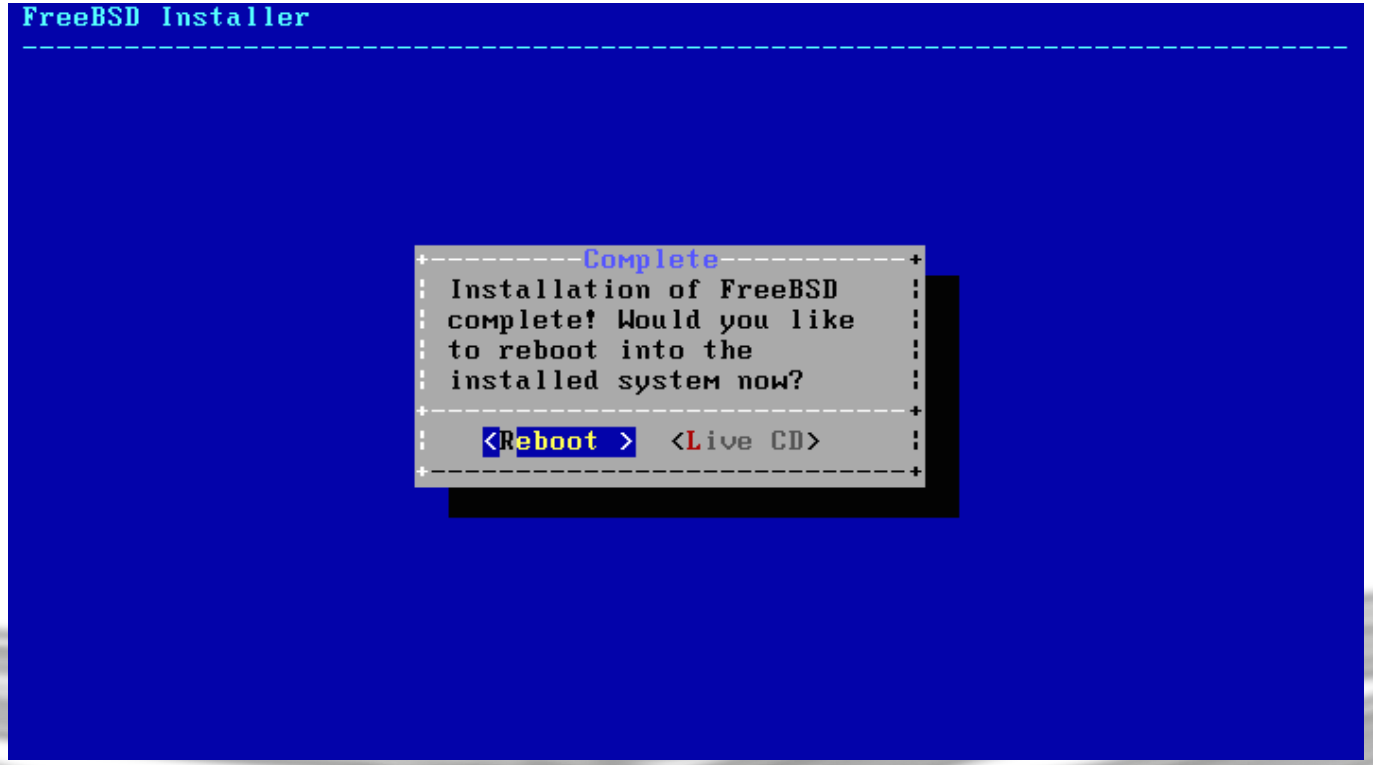
FreeBSD

- Further modifications? nuh



FreeBSD

- Reboot



FreeBSD

- Login as root

```
Mounting late file systems:.
Configuring syscons: blanktime.
Generating RSA1 host key.
2048 SHA256:DpyxhuYaYDW0Ic0ZD4oqJD6iyN23nkgajhEYRrvyvCg root@SianJhe (RSA1)
Generating RSA host key.
2048 SHA256:DntG91q4c9yJ3bjjmJRMNejLW72QUSoxNZ57QyBMgD8 root@SianJhe (RSA)
Generating DSA host key.
1024 SHA256:x6gviCVo7vUUBJ0t+YjTF1BpD/Szm8iwlkBaiGv37hI root@SianJhe (DSA)
Generating ECDSA host key.
256 SHA256:z+vZLADe+J23S/cZ+T2r3xIJ21dYF5NRxXnFl7WiqAo root@SianJhe (ECDSA)
Generating ED25519 host key.
256 SHA256:+MOLRcpOQSfov13i0PKCPgnoEkFgS/VZNSHOnzmKxxY root@SianJhe (ED25519)
Performing sanity check on sshd configuration.
Starting sshd.
Starting sendmail_submit.
Starting sendmail_msp_queue.
Starting cron.
Starting background file system checks in 60 seconds.

Sun Sep 25 17:50:41 CST 2016

FreeBSD/i386 (SianJhe) (ttyv0)

login: root
Password:
```

FreeBSD

- Voilà, fresh FreeBSD

```
login: root
Password:
Sep 25 17:51:05 SianJhe login: ROOT LOGIN (root) ON ttyv0
FreeBSD 10.3-RELEASE (GENERIC) #0 r297264: Fri Mar 25 03:51:29 UTC 2016

Welcome to FreeBSD!

Release Notes, Errata: https://www.FreeBSD.org/releases/
Security Advisories:   https://www.FreeBSD.org/security/
FreeBSD Handbook:      https://www.FreeBSD.org/handbook/
FreeBSD FAQ:           https://www.FreeBSD.org/faq/
Questions List: https://lists.FreeBSD.org/mailman/listinfo/freebsd-questions/
FreeBSD Forums:        https://forums.FreeBSD.org/

Documents installed with the system are in the /usr/local/share/doc/freebsd/
directory, or can be installed later with:  pkg install en-freebsd-doc
For other languages, replace "en" with a language code like de or fr.

Show the version of FreeBSD installed:  freebsd-version ; uname -a
Please include that output and any error messages when posting questions.
Introduction to manual pages:  man man
FreeBSD directory layout:      man hier

Edit /etc/motd to change this login announcement.
root@SianJhe:~ #
```

Build world and kernel

Build World and Kernel

1. Update source
2. Build world
3. Build and install kernel
4. Install world

Update source

- Determine if any outstanding patches are available, and if so, list the files that will be modified if the patches are applied
- `$ freebsd-update fetch`
- Apply the patches
- `$ freebsd-update install`

```
root@SianJhe:~ #
root@SianJhe:~ #
root@SianJhe:~ # freebsd-update fetch && freebsd-update install
```

Build World

- The **World** in FreeBSD includes:
  - kernel
  - core system binaries
  - libraries
  - built-in compiler
  - …

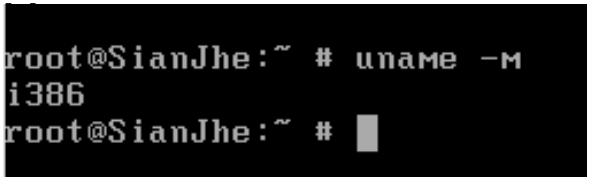
Build World

- Compile the new compiler and a few related tools, then use the new compiler to compile the rest of the new world. The result is saved to `/usr/obj`.
- `$ make -sC /usr/src buildworld`
- `-s` : silent, don't echo command as they are executed
- `-C <directory>` : specifies the directory of the makefile

- Then, go to watch a movie, wait a few hours…

Build and Install Kernel - Custom Kernel

- Determine your machine hardware architecture
- `$ uname -m`
- The kernel config file lies under `/usr/src/sys/<architecture>/conf/GENERIC`. Copy the `GENERIC` file instead of editing it directly
- `$ cp GENERIC MYKERNEL`
- Edit `MYKERNEL` to customize your own kernel



Build and Install Kernel

- Then, build and install the kernel
- `$ make -sC /usr/src kernel KERNCONF=MYKERNEL`
- Wait a few minutes…
- NOTE:
  `$ make kernel` and
  `$ make buildkernel && make installkernel` are equivalent

Install World

- Select 2 to boot into single user mode

Install World

- Make the root file system writable
- `$ mount -u /`
- Install world
- `$ make -sC /usr/src installworld`
- Check your FreeBSD version
- `$ uname -a`
- Print your kernel ident
- `$ uname -i`

Software Installation

Software Installation - Port Update

- To download a compressed snapshot of the Ports Collection into `/var/db/portsnap`, and extract the snapshot into `/usr/ports`
- `$ portsnap fetch extract`
- After the first use of Portsnap has been completed as shown above, `/usr/ports` can be updated as needed
- `$ portsnap fetch update`

Software Installation - Ports Tree

- Search the software repository, vim-lite for example
  - using `search` or `quicksearch`
  - using `name` or `key`
- `$ make -C /usr/ports search name=vim-lite`
- `$ make -C /usr/ports quicksearch key=vim-lite`
- Get to the repository
- `$ cd /usr/ports/editors/vim-lite`

Software Installation

- Fetch and compile the source
- `$ make install clean`
- Uninstall
- `$ make deinstall`

Useful tool - Portmaster

- Install portmaster
- `$ make -sC /usr/ports/ports-mgmt/portmaster install clean`
- Install or update a software via portmaster
- `$ portmaster -dG editors/vim-lite`
- Portmaster parameters :
  - `-a` : check all ports, upgrade if necessary
  - `-d` : always clean distfiles
  - `-G` : prevent “make config”
  - `-x` : avoid building or upgrading ports
  - ...

O
P
[
A
&
Q
?
/
>