

Virtualisation Exercise

Installing VirtualBox

Installing FreeBSD in a virtual machine

Chris Wilson

Joel Jaeggli

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Virtualisation Software

- KVM (Linux only)
- Parallels (Mac OS X only)
- QEmu
- VirtualBox
- Virtual PC (Windows only)
- VMware Server/Desktop
- VMware ESX
- Wine (Windows emulator for Unix)
- Xen

Virtualisation Features

- Hardware emulation
 - Processor (x86) and motherboard (Intel chipset)
 - Hard disks (IDE, SCSI, SATA) and CD-ROM drives
 - USB host controller (pass-through to host devices)
 - Keyboard and mouse (absolute pointing device)
 - Graphics controller (acceleration, resizing, remote)
 - Network and audio devices
- Paravirtual interface
 - Paravirtual device drivers
 - Balloon driver, remote command execution



Why VirtualBox

- Runs on Windows, Linux, Mac OS X, FreeBSD
- Free and open source (GPL) core
 - Some features require the non-free Extension Pack
- Easy to use (GUI and command line tools)
- Pretty fast and efficient
- Desktop application (easy to install)
- Can be run on FreeBSD to host FreeBSD or anything else.



Why not VirtualBox?

- Bare metal hypervisor preferred for production use:
 - Host OS can crash, killing all virtual machines
 - Host OS has an overhead (RAM, CPU)
 - Host OS is a security risk

System Requirements

- You will need:
 - A laptop or desktop
 - Windows, Macintosh, Linux or FreeBSD
 - About 2 GB RAM
 - About 20 GB free disk space
 - Administrative rights (root access)
 - A CD or DVD drive or wireless card
- If your laptop doesn't meet these specs:
 - Work with a partner



CD or Wireless?

- If possible, please use a FreeBSD CD/DVD/ISO image.
 - Disks available on loan, please ask and sign for
 - Please return your disk after the session, sorry!
- If you don't have a CD drive
 - You can install over the wireless network
 - Bandwidth is limited and shared between all of us
 - Using CD or DVD or ISO will be much faster for you
 - Using CD or DVD or ISO will speed up wireless install



Installing VirtualBox

- We have local copies for:
 - Windows
 - Mac OS X
- Download local copies at:
 - <http://www.ws.afnog.org/afnog2011/sse/virtualisation/>
- For other platforms, please visit:
 - <http://www.virtualbox.org/wiki/Downloads>
 - Linux versions are at:
 - https://www.virtualbox.org/wiki/Linux_Downloads

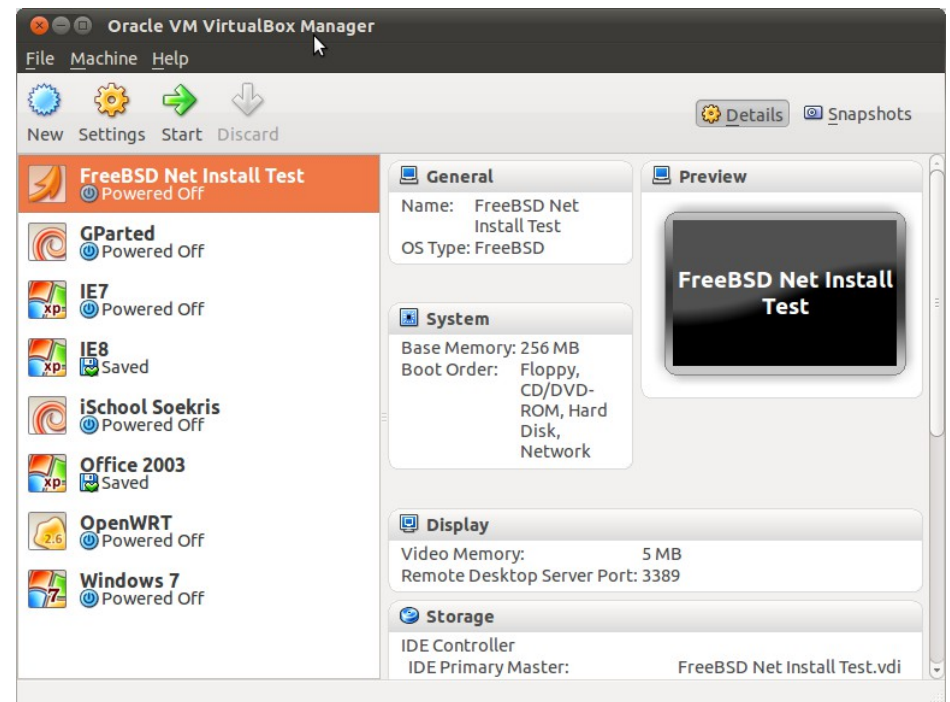


Running VirtualBox

- On Windows:
 - Start/Programs/Oracle VM VirtualBox
- On Mac OS X:
 - Hard Disk/Applications/Oracle VM VirtualBox
- On FreeBSD:
 - Open a terminal and type `VirtualBox`
- On Linux:
 - Applications/System Tools/Oracle VM VirtualBox

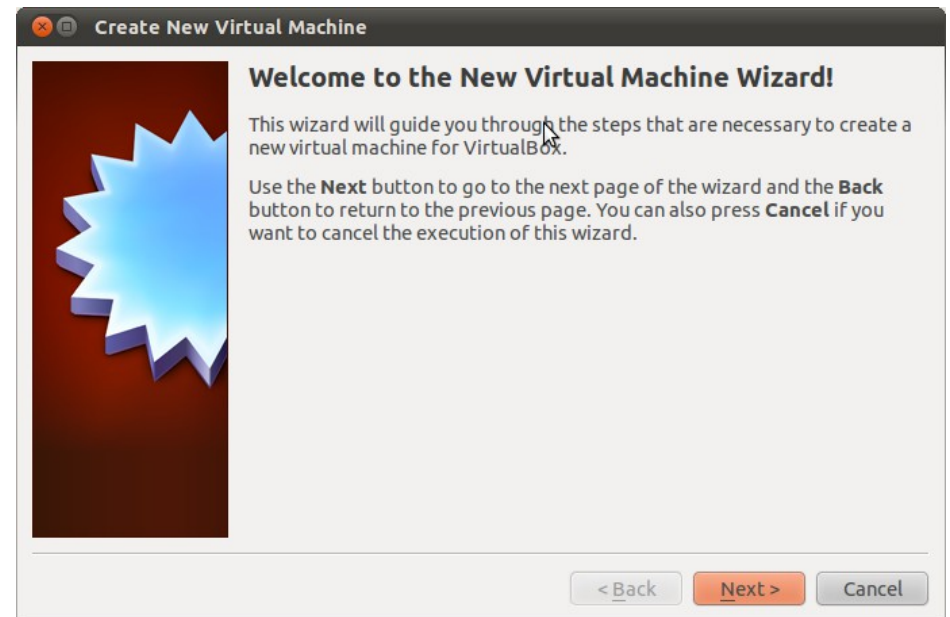
VirtualBox Main Window

- List of virtual machines
 - Probably empty!
- Settings of the selected virtual machine
- Screen preview
- Buttons to control VMs:
 - New
 - Settings
 - Start



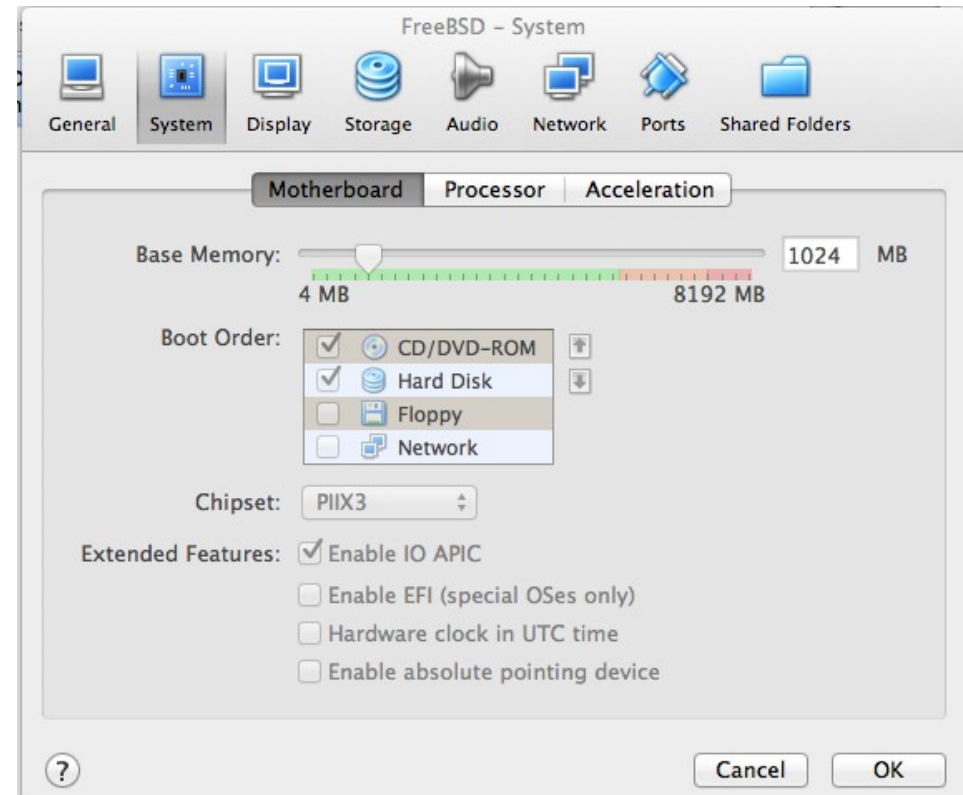
Creating a Virtual Machine

- Create a **New** virtual machine
- Type **FreeBSD** as the name
- Virtual RAM:
 - Use less than half your machine's total RAM
 - 512MB is an acceptable minimum
- Virtual hard disk:
 - Dynamic expanding, 20 GB



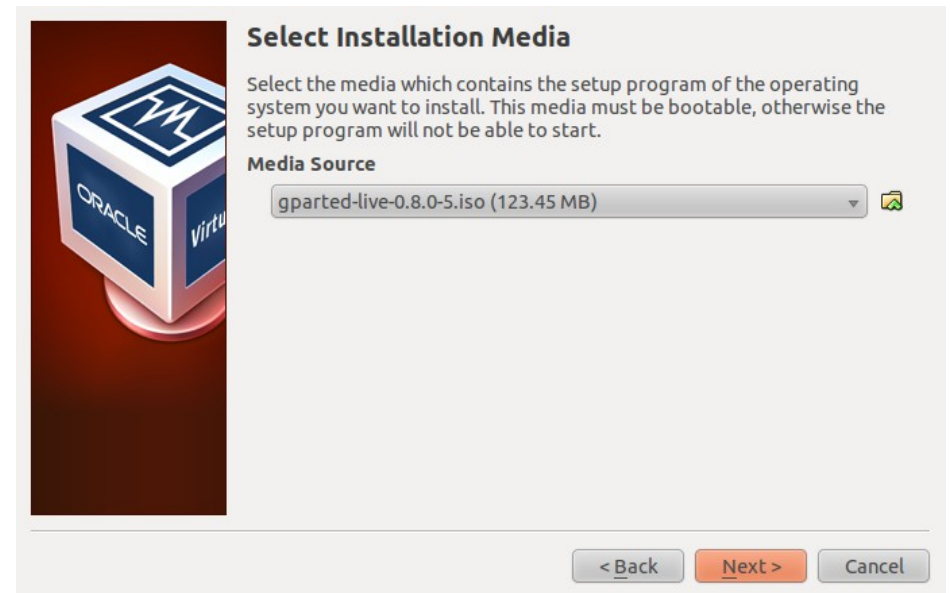
Hold your horses!

- Don't start it yet!
- Need to change settings for IO APIC
- Click Settings
- Click System
- Click motherboard
- Enable IO APIC
- Ok/close



Go!

- The First Run Wizard appears
- Only useful if you have an Operating System on an ISO image (copied off USB or downloaded from NOC)



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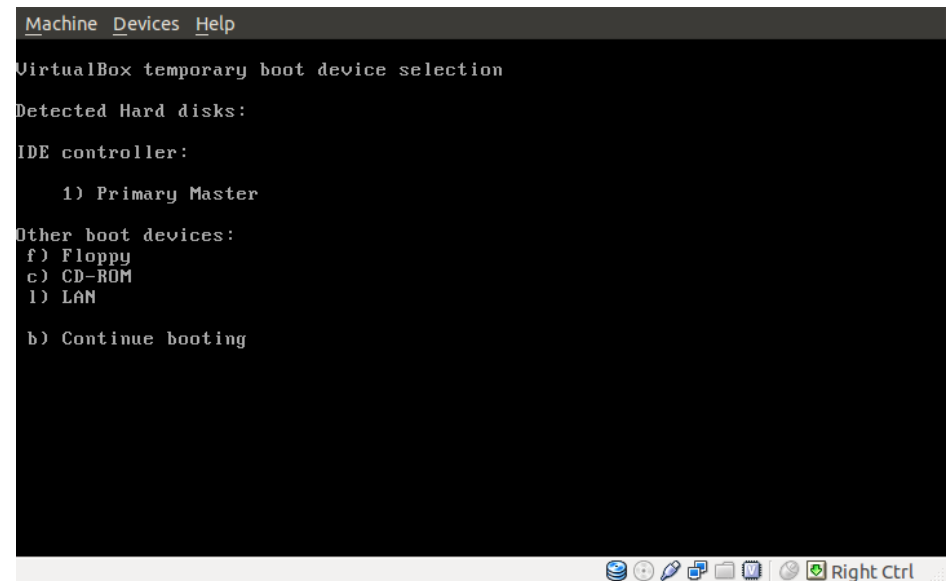
Boot Device

- When you see: *Press F12 to select boot device*
- Press **F12**
- If you miss it, choose *Machine/Reset* menu to try again



Boot Menu

- If booting from CD iso:
 - Insert the disk now
 - Choose *Devices/CD or DVD Device* menu
 - Select your CD-ROM image
- Press **C** to boot from CD-ROM
- Press **L** to boot from LAN (Network)

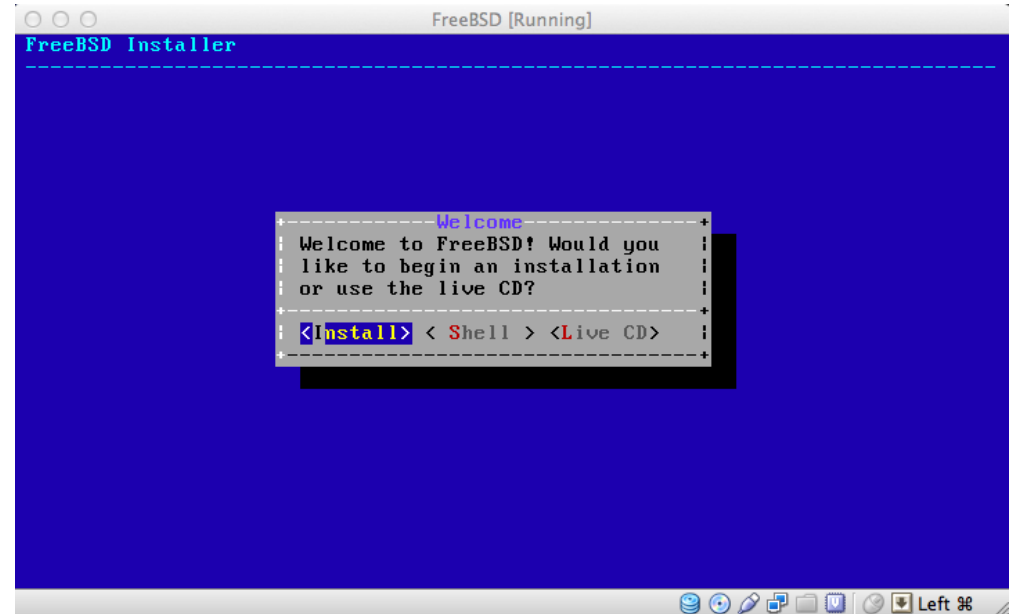


```
Machine  _Devices  _Help
VirtualBox temporary boot device selection
Detected Hard disks:
IDE controller:
    1) Primary Master
Other boot devices:
f) Floppy
c) CD-ROM
l) LAN
b) Continue booting
```

The screenshot shows a terminal window titled "VirtualBox temporary boot device selection". It lists detected hard disks and IDE controllers. Under "Other boot devices", it lists f) Floppy, c) CD-ROM, and l) LAN. At the bottom, there is an option b) Continue booting. The window has a menu bar with "Machine", "Devices", and "Help". At the bottom right, there is a "Right Ctrl" button.

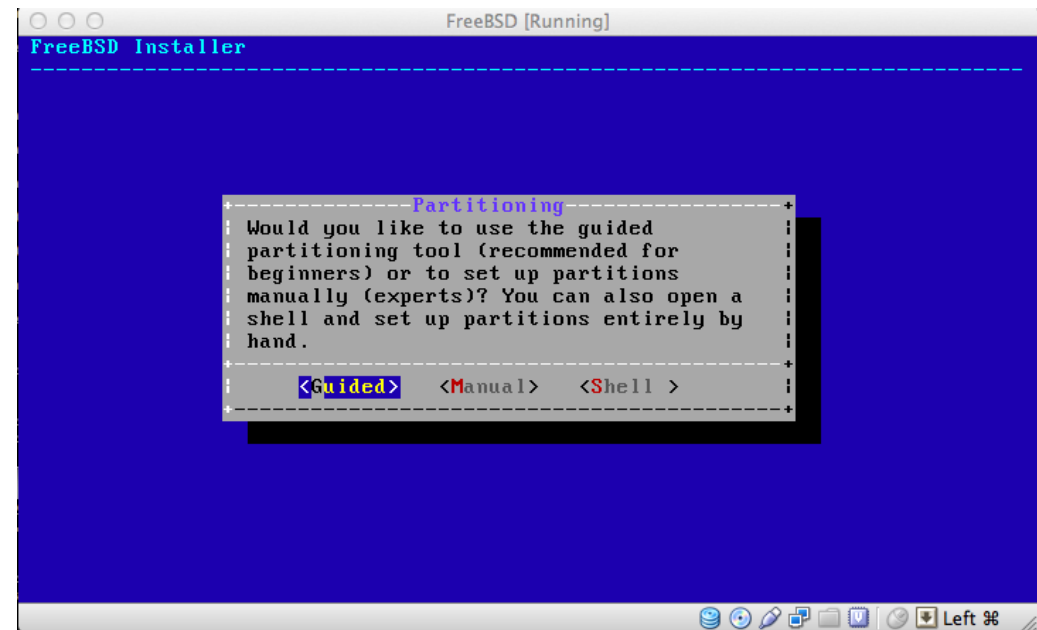
FreeBSD Installer

- Text “windows”
- Buttons at the bottom
- **TAB** key to switch buttons
- **Enter** key to activate the selected button
- **Up** and **Down** arrows to select item from menu
- Select **OK** to activate
- New installer as of 9.1



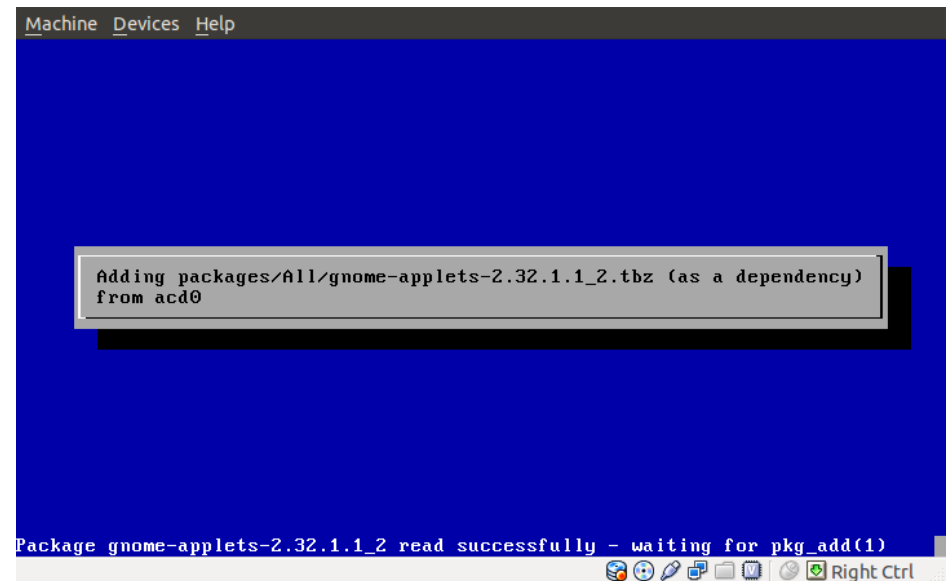
Standard install is quite simple

- Accept defaults most of the way through
- Set hostname
- Do guided partitioning and let FreeBSD use the whole disk.
- Set root password and
- Create a new user
- Then you should be complete.



Install packages and reboot

- Confirm the selected packages
- Wait for them to install
- Choose *Exit*
- From the main menu, choose *Exit Install*
- Virtual machine will reboot into FreeBSD!

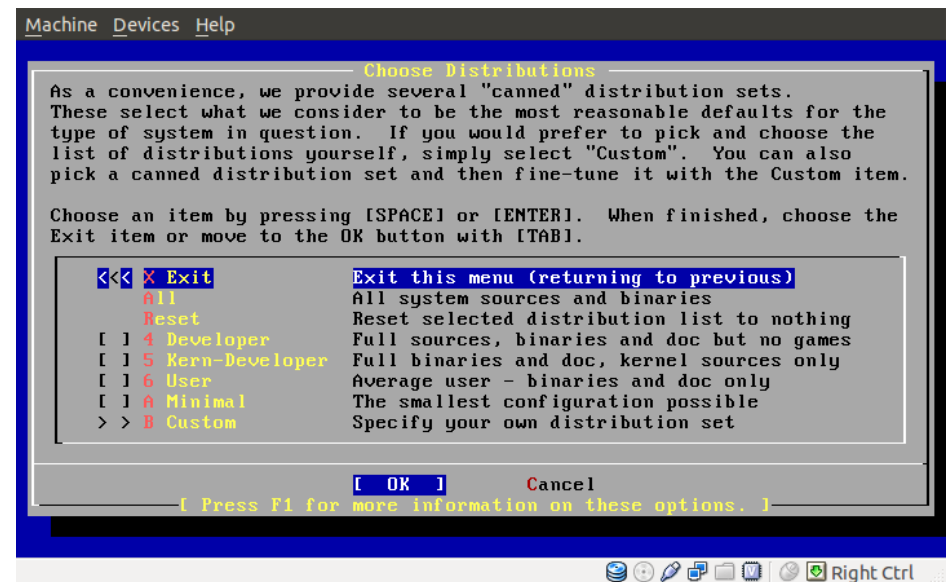


The screenshot shows a terminal window with a blue background. At the top, there is a menu bar with 'Machine', 'Devices', and 'Help'. A grey dialog box in the center contains the text: 'Adding packages/All/gnome-applets-2.32.1.1_2.tbz (as a dependency) from acd0'. At the bottom of the window, a status bar displays: 'Package gnome-applets-2.32.1.1_2 read successfully - waiting for pkg_add(1)'. On the far right of the status bar, there is a 'Right Ctrl' button with a green checkmark icon.

Backup Slides

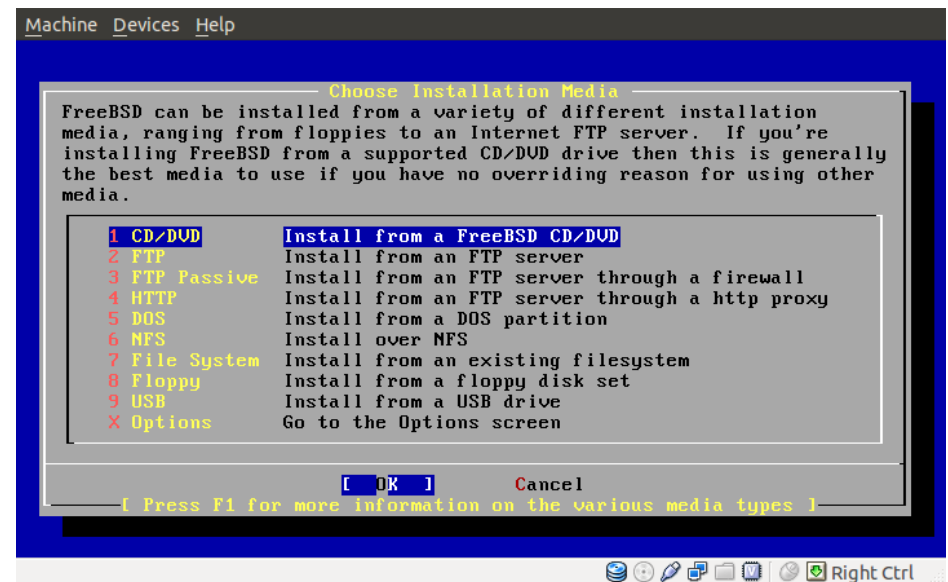
Distributions Menu

- Choose *User*
- Choose *English Documentation*
- Choose *Exit*
- Say *Yes* to installing FreeBSD Ports
- Choose *Exit*
- Choose *Commit*



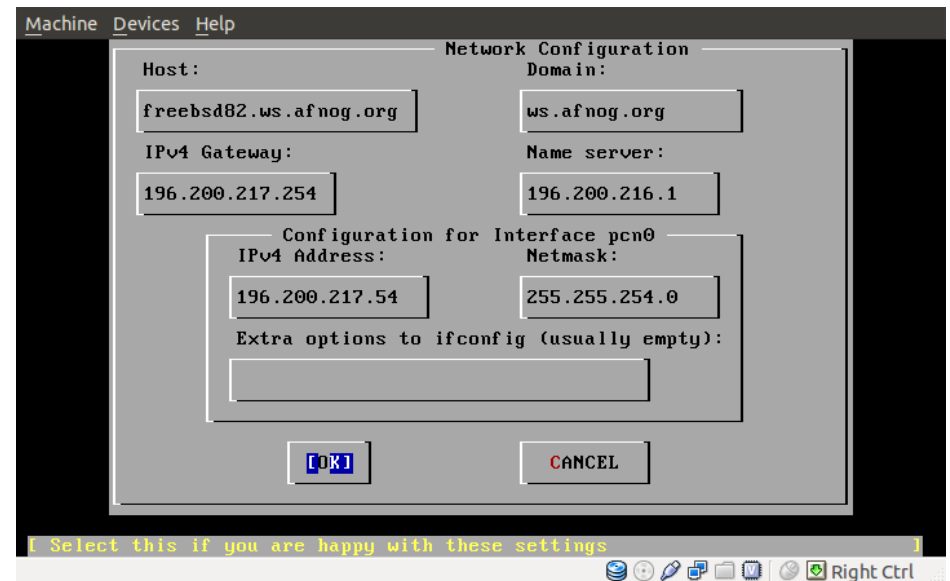
Installation Media

- If installing from CD or DVD:
 - Choose *CD/DVD*
- If installing from the LAN (network):
 - Choose *FTP*
 - Choose *URL* to access the local mirror
 - Enter (on one line):
ftp://196.200.219.250/fb82



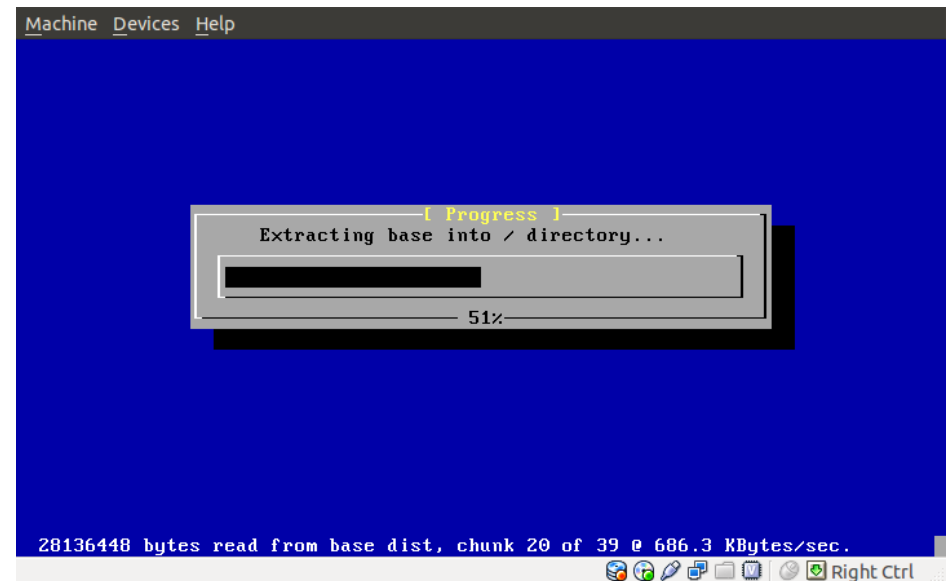
Network Configuration

- IPv6 configuration: *No*
- DHCP configuration: *No*
- Enter a reasonable hostname, e.g. **freebsd82**
- Press **Tab** to switch fields
- Remove any quote marks from *Host* and *Domain*



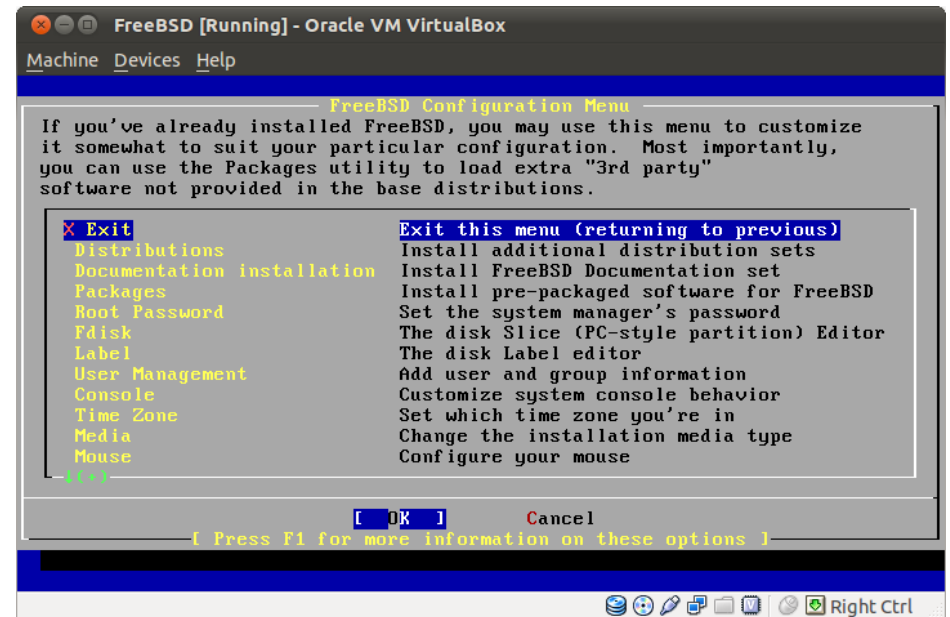
Installation Process

- This will take a few minutes
- Return to distributions menu: *No*
- From the main menu, choose *Configure*



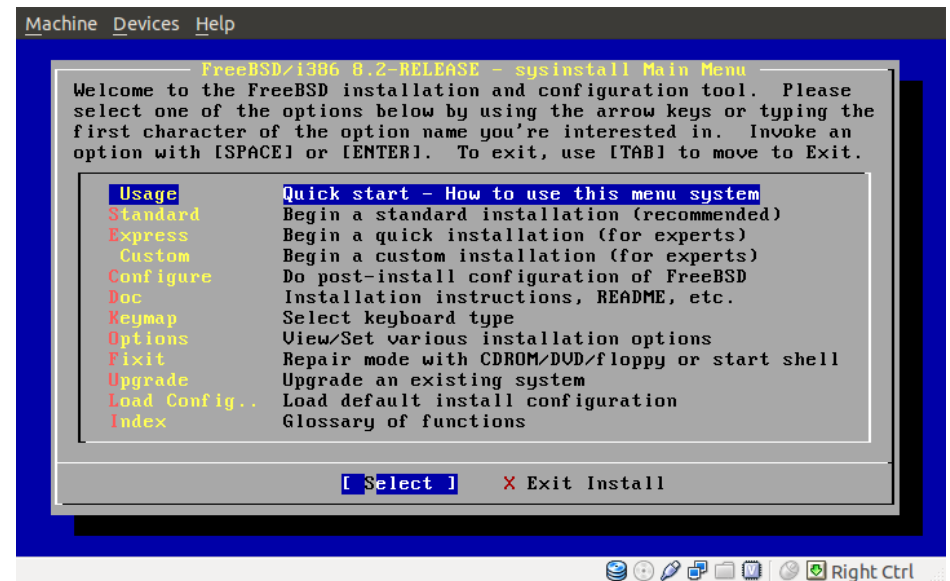
Configuration Menu

- To install Gnome GUI:
 - Choose *Packages*
 - Choose *gnome*
 - Choose *gnome2*
 - Choose *Cancel* to exit the gnome package list
 - Choose *x11*
 - Choose *xorg-7.5*
 - Choose *Cancel* to exit the x11 package list
 - Choose *Install*



Initial Settings

- Select your home country, e.g. *Tanzania*
- Select your keyboard
- Should see the *Main Menu* (right)
- Choose *Custom*



Enable Gnome Desktop

- Login as **root**
- Edit **/etc/rc.conf** and add:
 - **gnome_enable=YES**
 - **dbus_enable=YES**
 - **hald_enable=YES**
- Add a user:
 - **pw useradd -G wheel chris**
 - **passwd chris**
- Reboot and enjoy!

