



Getting Started With FreeBSD



Roller Angel - FreeBSD Sys Admin
Drew - FreeBSD Foundation

Welcome

Learn about and install FreeBSD

Set up desktop, learn to navigate shell, and more!

Set up a jail, learn about Poudriere, learn about Ansible

Use an Ansible Playbook to build a private package building repository

Use an Ansible Playbook to configure FreeBSD in a separate VirtualBox VM



Let's Get Started!

First, we need to install VirtualBox

- Download VirtualBox here <https://www.virtualbox.org/wiki/Downloads>

Next we need to download FreeBSD

- Visit the official [FreeBSD releases page](https://www.freebsd.org/where.html) (<https://www.freebsd.org/where.html>). The disk images are listed *in order of release date*, so the most recent release can be found at the top of the page.

For **32-bit** machines, click on **i386** - For **64-bit** machines, click on **amd64**

FreeBSD 13.1-RELEASE

Installer Images	Virtual Machine Images	SD Card Images	Documentation
amd64 i386 powerpc powerpc64 powerpc64le powerpcspe armv6 armv7 aarch64 riscv64	README amd64 i386 aarch64 riscv64 amd64 (BASIC-CI)	aarch64 PINE64 PINE64-LTS ROCK64 ROCKPRO64 RPI (3/4) armv6/armv7 GENERICSD RPI-B riscv64 GENERICSD	Released : May 16, 2022 Release Notes Readme Hardware Compatibility List Installation Instructions Errata Signed Checksums



Selecting Correct FreeBSD Image

After clicking the link, you will be redirected to a file directory containing multiple formats and versions of the FreeBSD installer.

Index of /releases/amd64/amd64/ISO-IMAGES/13.1/

File Name ↓	File Size ↓	Date ↓
Parent directory/	-	-
CHECKSUM.SHA256-FreeBSD-13.1-RELEASE-amd64	1171	2022-May-12 11:24
CHECKSUM.SHA512-FreeBSD-13.1-RELEASE-amd64	1811	2022-May-12 11:23
FreeBSD-13.1-RELEASE-amd64-bootonly.iso	383877120	2022-May-12 09:09
FreeBSD-13.1-RELEASE-amd64-bootonly.iso.xz	86579284	2022-May-12 09:09
FreeBSD-13.1-RELEASE-amd64-disc1.iso	1047048192	2022-May-12 09:08
FreeBSD-13.1-RELEASE-amd64-disc1.iso.xz	749479840	2022-May-12 09:08
FreeBSD-13.1-RELEASE-amd64-dvd1.iso	4621281280	2022-May-12 09:32
FreeBSD-13.1-RELEASE-amd64-dvd1.iso.xz	3413260180	2022-May-12 09:32
FreeBSD-13.1-RELEASE-amd64-memstick.img	1172165120	2022-May-12 09:36
FreeBSD-13.1-RELEASE-amd64-memstick.img.xz	756161016	2022-May-12 09:36
FreeBSD-13.1-RELEASE-amd64-mini-memstick.img	455889408	2022-May-12 09:39
FreeBSD-13.1-RELEASE-amd64-mini-memstick.img.xz	93716952	2022-May-12 09:39

The format you are looking for is the file ending in **bootonly.iso** as pointed out by the arrow above. Click this file and it will start downloading the installer.

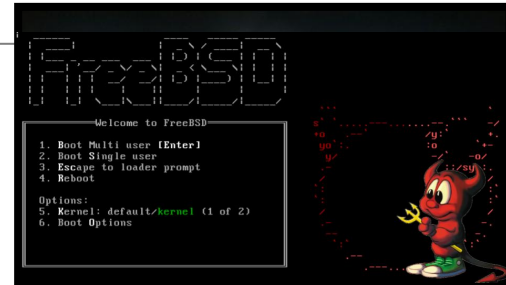
If you're installing FreeBSD to a real computer you will want the **memstick.img** version as show in the available video tutorial

We also have an available video tutorial that shows using **disc1.iso**



The FreeBSD World

FreeBSD is an open source Unix-like **operating system** descended from the Unix developed at the University of California, Berkeley in the 1970s.



The FreeBSD Project is an active open source **community** since 1993 with hundreds of committers and thousands of contributors around the world.

The FreeBSD Foundation is a **non-profit organization** registered in Colorado, USA in 2000 dedicated to supporting the FreeBSD Project, its development and its community.



What is FreeBSD?

It's not a Linux Distribution!

One of the oldest (1993), largest, and most successful open source projects in the world

Complete operating system including kernel, userland, documentation, and tools

Over 30,000 3rd Party Open Source Packages



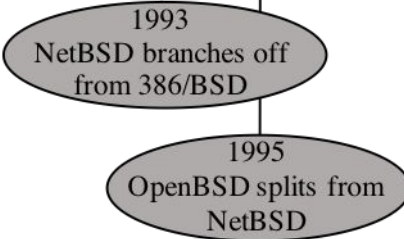
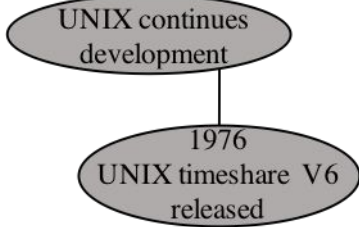
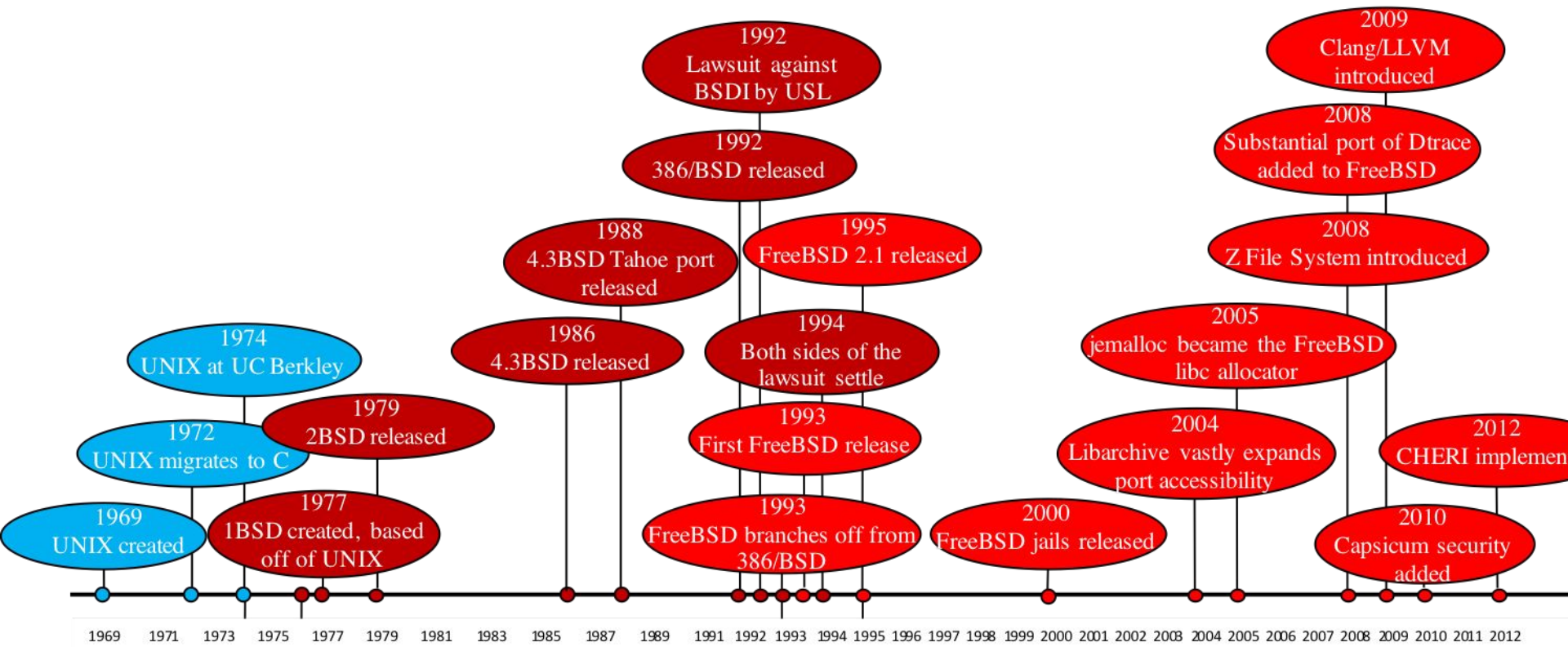
What is FreeBSD?

Created and distributed by a community of highly technical and committed contributors (Over 400 active developers and thousands of contributors)

Works on Intel / AMD x86 32 and 64-bit, 32 and 64 bit ARM, RISC-V, PowerPC, Sparc64, MIPS, AWS, Azure, GCP, ...

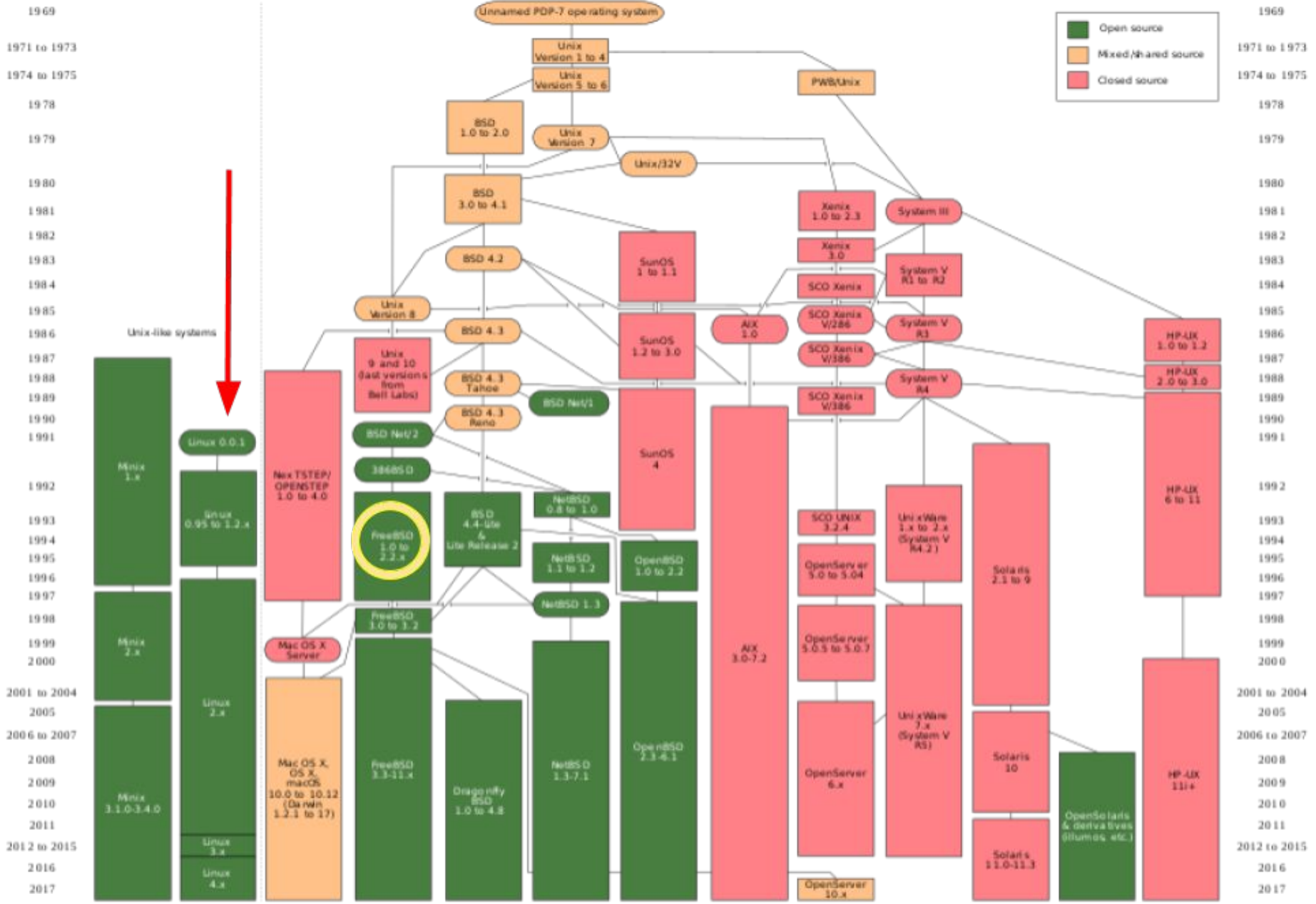
10s of millions of deployed systems





World-leading networking performance







Ken Thompson (sitting) and Dennis Ritchie working together at a PDP-11

1969

UNIX

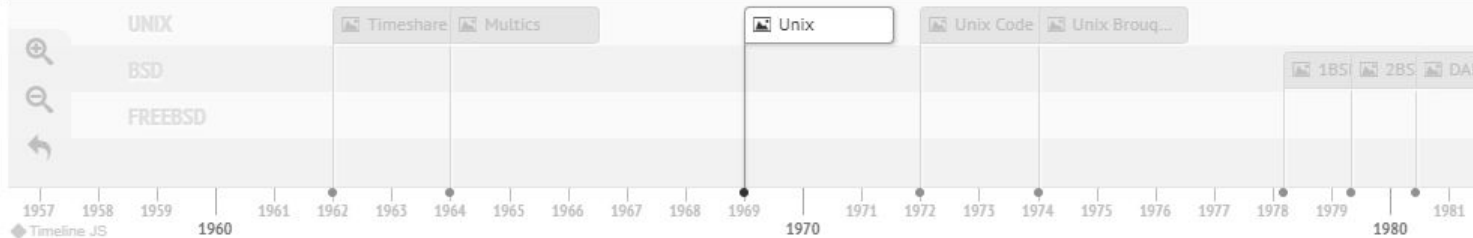
Before Bell Labs left the Multics project, Dennis Ritchie and Ken Thompson got a taste of what Multics could be capable of. They secured funding from the Bell Labs Legal department to purchase a more powerful PDP-11/20 machine. In 1969 Ken Thompson, Dennis Ritchie and others started working on a new program that utilized the full capabilities of the more powerful computer. This program was called Unics (Uniplexed Information and Computing Service).



MULTICS



UNIX CODE
MIGRATES TO C





UC Berkeley

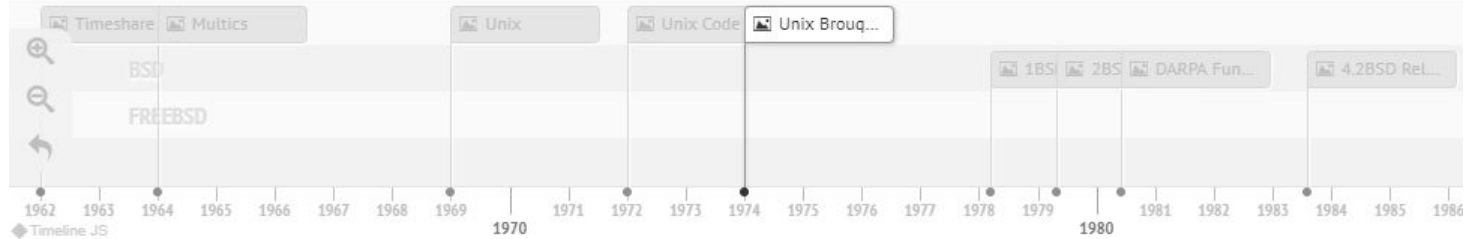
1974

UNIX BROUGHT TO UC BERKELEY

In 1974, Professor Bob Fabry of the University of California, Berkeley, acquired a UNIX source license from AT&T. Bob Fabry had previously seen UNIX 4 at the ACM Symposium (Association for Computing Machinery) on Operating System Principles in 1973 and was interested in bringing it to the University. The Computer Systems Research Group started to modify and improve AT&T Research Unix. They called this modified version "Berkeley Unix" or "BSD".

UNIX CODE
MIGRATES TO C

BSD RELEASE



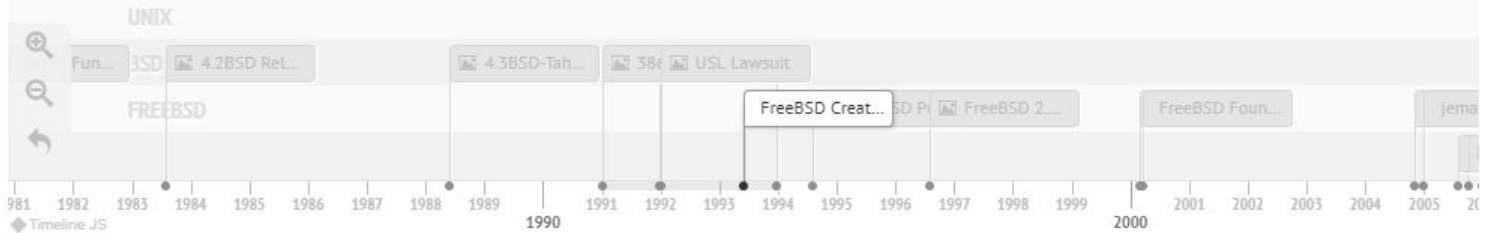


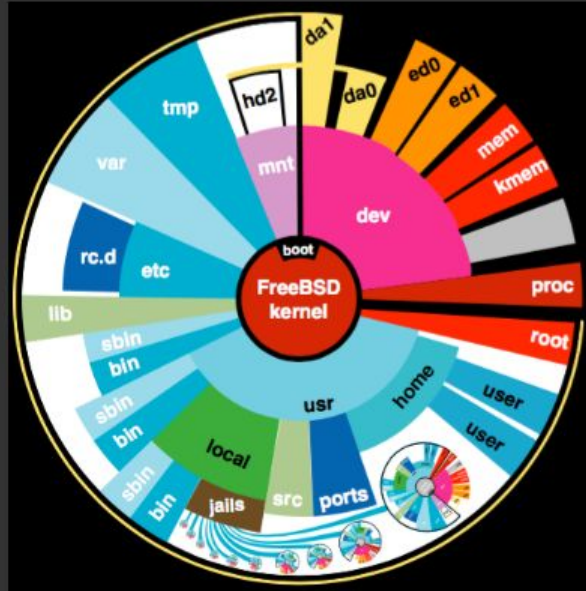
Walnut Creek CD-ROM cover for FreeBSD 1.1

JUNE 1993

FREEBSD CREATED

The development flow of 386BSD was slow and after a period of neglect, a group of 386BSD users decided to branch out on their own and create FreeBSD so that they could keep the operating system up to date. On 19 June 1993, the name FreeBSD was chosen for the project. The first version of FreeBSD was released on November 1993.





MARCH 2000

FREEBSD JAILS

FreeBSD Jails were released with FreeBSD 4.X in early 2000. The jail mechanism is an implementation of operating system-level virtualization which allows system administrators to partition a FreeBSD system into several independent min-systems or "Jails". This gave sys admins much more power to secure and optimize their FreeBSD systems.



FreeBSD 2.1.5



FreeBSD
FOUNDATION
FOUNDED





CheriBSD running on a ChERI processor.

2012

ChERI

In 2012, the University of Cambridge started developing Capability Hardware Enhanced RISC Instructions (ChERI), an outgrowth based off of the earlier Capsicum project. ChERI transposes the Capsicum hybrid capability model into the CPU architecture space, allowing fine-grained compartmentalisation within process address spaces – while continuing to support current software designs.



Who Uses FreeBSD



NETFLIX



JUNIPER
NETWORKS®



SONY
NGINX

vmware
arm

trivago®

GROUPON®

FlightAware
Live Flight Tracking



VERISIGN®



Most Likely You Use FreeBSD!



iPhone or Apple computer

Streaming Netflix

NETFLIX



Messaging someone over Facebook's WhatsApp application

Sony PlayStation 4



FlightAware



Nintendo Switch



Why Use FreeBSD?

- Friendly and Approachable Community
- Excellent Documentation
- Good Tooling and Modern Compilers
- Consistent Development and Release Processes
- Wide Variety of Architectures Supported
- Secure
- It's the cool operating system to use! (Heard from many students)



Why Companies Use FreeBSD?

- History of innovation
- Great tools
- ABI stability within major releases
- Mature release model
- Excellent documentation
- Business Friendly License
- ZFS
- Open Community



How the Project Works

Independent of the FreeBSD Foundation

Developer Elected Core Team

Mentorship for Commit Bit

Functional Teams (core, release engineering, security, ports, documentation,...)

Collaborative Development Environment



FreeBSD core team

Historically “key” developers but now...

...9-member elected management body

- Votes and candidates from the full set of active committers
- Co-opted non-voting core team secretary

Responsibilities

- Administrative (commit bits, hats, team charters)
- Strategic (project direction, coordination, cajoling)
- Rules, conflict resolution, enforcement

We have no “benevolent” dictators for life!

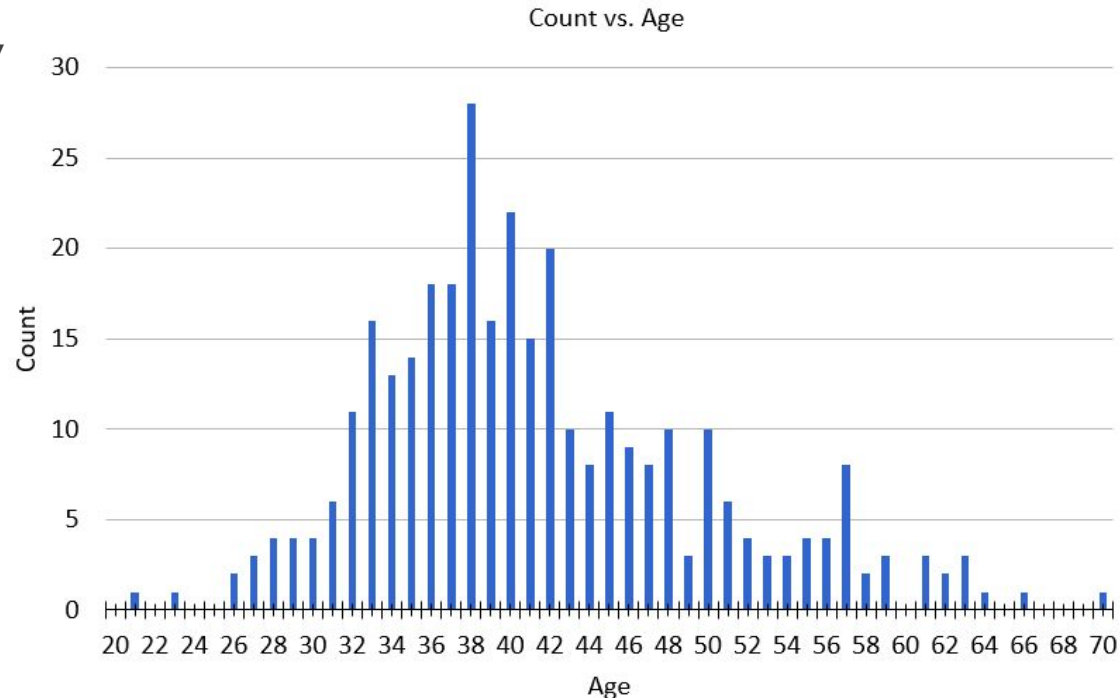
Who are the FreeBSD committers

Locations

- 34 countries
- 6 continents

Ages

- Oldest (documented) committer born in 1948
- Youngest (documented) committer born in 1997
- Average age 39.5
- Data from circa Nov 2017



Applications

Netflix – High performance content delivery

NETFLIX

Sony Playstation 4 - Embedded



NetApp ONTAP – FreeBSD based enterprise storage



NetApp™

Groupon and WhatsApp - Datacenter applications



Apple - Uses large portions of FreeBSD in their Mac OS and iOS



Citrix Netscaler



Microsoft – Supports FreeBSD in the cloud environment



Citrix **NetScaler**

Why Get Involved in FreeBSD?

Gain marketable skills like:

Communication – How to ask questions – Distributed team

Collaboration

Tools – Repositories, bug reporting, IRC, ...

Best Practices

Technologies – Operating Systems, File Systems, Networking, Storage



Why Get Involved in FreeBSD?

- Be part of an inclusive and welcoming community
- Learning opportunities from experts
- Opportunities to work in areas you're interested in
- Resume building - highlight skills in public forum
- Have fun working with like minded individuals
- Learn from reading real operating system code!



How You Can Contribute To FreeBSD

Report or fix a bug in the code

Documentation - improve, translate, fix documentation

Write about FreeBSD in a blog post, article, on social media

Educate people about FreeBSD - teach a workshop like this one!

Useful commands

Avoiding Issues

\$ ^C (Ctrl-C)
\$ ^U (Ctrl-U)

Terminate command
Clear to start of line

Rebooting / Shutting Down

\$ sudo shutdown -p now **Power down**
\$ sudo init 0 **Power down**
\$ sudo shutdown -r now **Reboot**
\$ sudo init 6 **Reboot**
\$ exit
\$ logout **Log out**

\$ drill
\$ less
\$ grep

Display present work directory

\$ pwd

Change to your home directory

\$ cd
\$ cd ~

Change to parent directory

\$ cd ..

Finding Information

\$ man cmd

Access the “cmd” command manual page, replace with most commands.

Files

\$ touch filename **Create file if it does not exist**
\$ rm -rf directoryname **Delete directory recursively**
\$ rm filename **Delete file**
\$ mv olddirectoryname newdirectoryname **Rename a directory**
\$ mv oldfilename newfilename **Rename a file**
\$ locate filename **Find file (full filename not needed)**

File Editing

\$ vi filename **Opens the vi editor**
 (to exit vi type ESC :wq followed by Enter or ESC ZZ)
\$ ee filename **Opens the ee editor**

Change to previous directory

\$ cd -

Download a file from the internet

\$ fetch http://website.example.com/filename.txt

Using the history command

Enable command history in tcsh so you can have a record of the commands you've typed.

This can be an extremely valuable tool that you'll find yourself using a lot.

Type **history** at anytime to see the command history

To view the output one page at a time, pipe the command into a pager like less

history | less

Use **arrow keys** to navigate and **q** to exit

Setting up the tcsh shell (full .tcshrc config)

```
set black = '%{\033[30m%}'
set red = '%{\033[31m%}'
set green = '%{\033[32m%}'
set yellow = '%{\033[33m%}'
set blue = '%{\033[34m%}'
set magenta = '%{\033[35m%}'
set cyan = '%{\033[36m%}'
set white = '%{\033[37m%}'
set nocolor = '%{\033[0m%}'
```

```
if ($?prompt) then
    set prompt = "[${red}%n@m:%~${nocolor}][${yellow}%h${nocolor}]>%b: "
endif
```

```
set history = 99999999
set savehist = (99999999 merge lock)
set histfile = ~/.tcsh_history
```

```
# like Ctrl-d, just push TAB
set autolist
```

```
# one last chance to double-check I really am deleting the files I want to delete
set rmstar
```

```
# typo correction for commands
# set correct=all
```

```
# prevent shell from clobbering existing file if forget to use >> (append) and just use one >
set noclobber
```

```
# Fairly popular aliases to try out
alias la ls -laG
alias ll ls -G
```

Download this config rather than typing it all out by hand; simply use the following commands:

```
fetch http://bsd.pw/config/tcshrc
mv tcshrc ~/.tcshrc
```

Introduction to FreeBSD Jails

FreeBSD Jails provide completely separated environments containing a FreeBSD instance.

FreeBSD Jails provide lightweight virtualization on the bare metal, sharing a space in the host operating systems kernel. With jails one can configure soft resource limits that can be updated live on the spot with one change in configuration on the host with no requirement to shut the system down first to make the changes.

Jails are an excellent solution for testing software while developing and installing many packages as well as for running software packages in production.



Think of a jail like one of those special mirrors that don't just reflect but allow others to peer in-

- the admin on the host machine can look inside and control the jail

- the admin on the jailed machine can't look outside the jail or change configuration on the host machine, they may not even realize they're in a jailed environment at all



Introduction to compiling FreeBSD ports with Poudriere

Poudriere combines the power and simplicity of packages with the customizability of ports.

The customized ports are built in an isolated environment, a FreeBSD Jail, so that the resulting packages are identical to those built on another system running Poudriere.

Once Poudriere has compiled a collection of packages, it is just a matter of setting up a repository to get those packages installed.

Introduction to Ansible on FreeBSD

Ansible is a popular open-source tool written in Python that provides automation, configuration management, and orchestration all in one.

Learn how to use Ansible for configuration management on FreeBSD. We'll get started with script like functionality using the commands you just learned. We'll explore how you can rewrite commands as you learn the Ansible Modules and unlock the power of idempotence.

We'll dig into the details of Ansible playbooks and how to go about constructing your own. Learn how to take full advantage of Ansible by building thoughtfully designed tasks. Explore Ansible functionality like roles and variables, using Ansible Vault to encrypt secret information.

We'll finish the day by running two Ansible Playbooks that will automate two processes on a separate VirtualBox VM. We will automate Poudriere and build a private package building repository. Then we will automate the configuration of our FreeBSD system for use as a desktop.



Learn more about FreeBSD

Website: www.freebsd.org

FreeBSD Foundation: www.freebsd.foundation.org

GitHub: github.com/freebsd

Mailing Lists: <https://lists.freebsd.org/mailman/listinfo>

Forums: <https://forums.freebsd.org>

FreeBSD Handbook: <https://www.freebsd.org/doc/handbook/>

IRC

FreeBSD Handbook

The FreeBSD Documentation Project

Revision: [52835](#)

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Last modified on 2019-02-28 19:15:26 by bhd.

Abstract

Welcome to FreeBSD! This handbook covers the installation and configuration of the operating system. This book is the result of ongoing work by many people, and helping to update and expand this document should be a high priority for all of us.

The latest version of this book is available from the [FreeBSD Handbook](#) (<https://docs.freebsd.org/doc/>). The book can be downloaded from the [FTP server](#) or one of the numerous [mirror sites](#). Printed and electronic versions of the handbook and other documents on the project are available.

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Resources

Amount Raised: \$1,332,398
Goal: \$1,250,000
Donors: 979

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How-To Guides

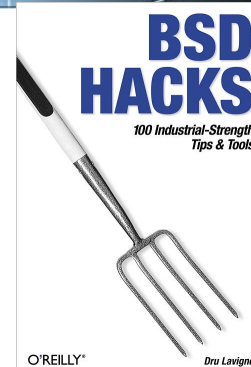
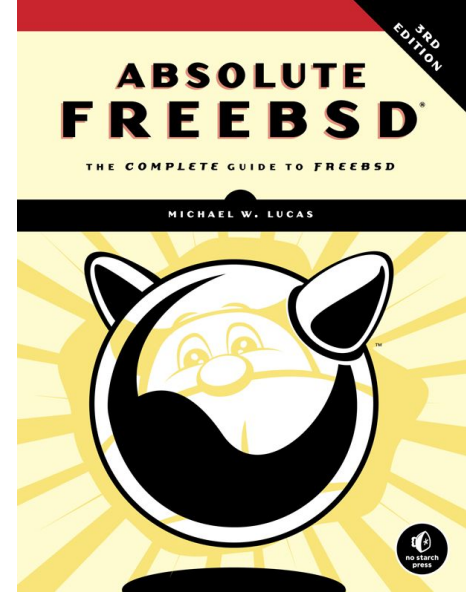
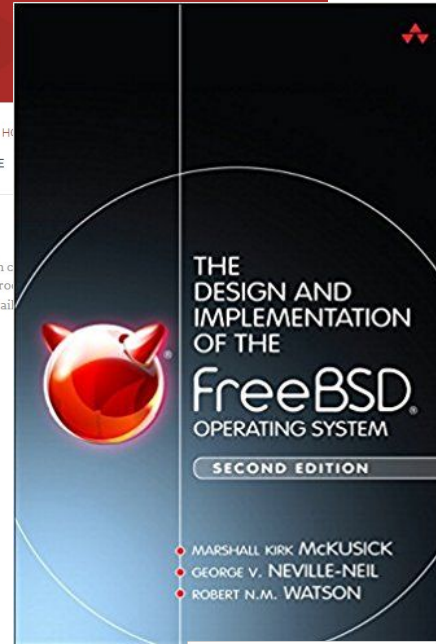
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[OCTOBER 2018 FREEBSD DEVELOPER SUMMIT](#) [FREEBSD DAY](#) [TIMELINE](#)

Getting Started with FreeBSD

As part of the FreeBSD Foundation's education initiative, we've worked with our community to develop guides that make getting started with FreeBSD a straight forward process. Check out the *FreeBSD Quickstart Guide*. Stay tuned for more how-tos as they become available.

FreeBSD Installation Guides:

- [Installing FreeBSD with VirtualBox \(Mac/Windows\)](#)
- [Installing a Desktop Environment on FreeBSD](#)
- [Installing FreeBSD for Raspberry Pi](#)
- [Installing PC-BSD as a Primary Operating System](#)



<https://www.mckusick.com/history/>

<https://www.freebsd.org/doc/handbook/>

deb@freebsd.foundation

Roller's Website <http://BSD.pw>

<http://BSDNow.tv>

<http://mwl.io>

https://www.linuxcbt.com/products_unixcbt_bsd1x_edition

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