FreeBSD Around the World!

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The FreeBSD Foundation
@dgoodkin

Goals

- Share FreeBSD's long history

- What is FreeBSD and Why People Use It

- Why you should use and/or contribute to FreeBSD

- FreeBSD Foundation Highlights and Advocacy

- Q&A

What is FreeBSD?

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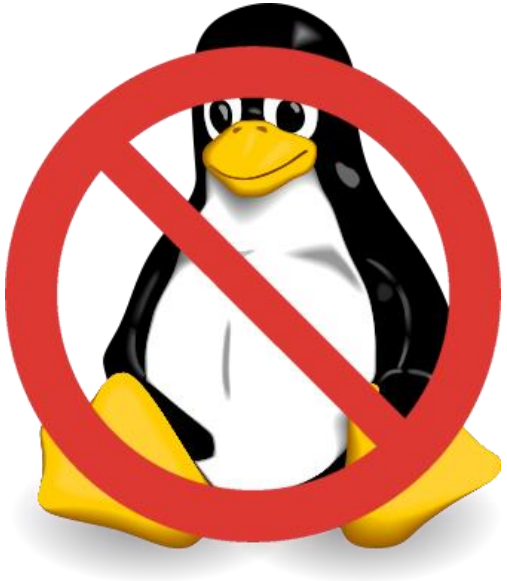
What is FreeBSD?



It's not a Linux Distribution!

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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 501(c)3 **non-profit organization** registered in Colorado, USA in 2000 dedicated to supporting the FreeBSD Project, its development and its community.

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What is FreeBSD?

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 33,000 3rd Party Open Source Packages

What is FreeBSD? (cont)

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, MIPS, AWS, Azure, GCP, …

10s of millions of deployed systems

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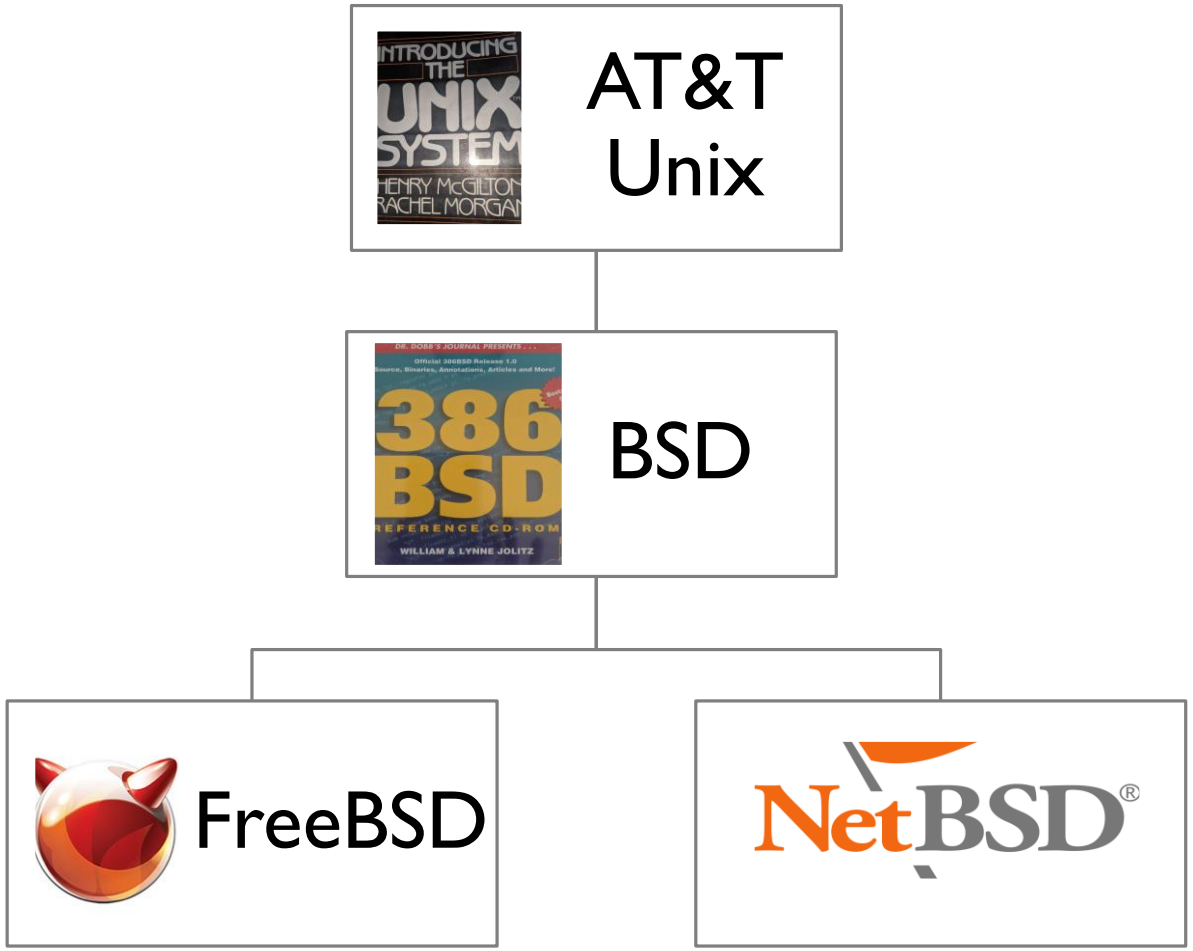
Abridged BSD Family Tree



The Evolution of

FreeBSD

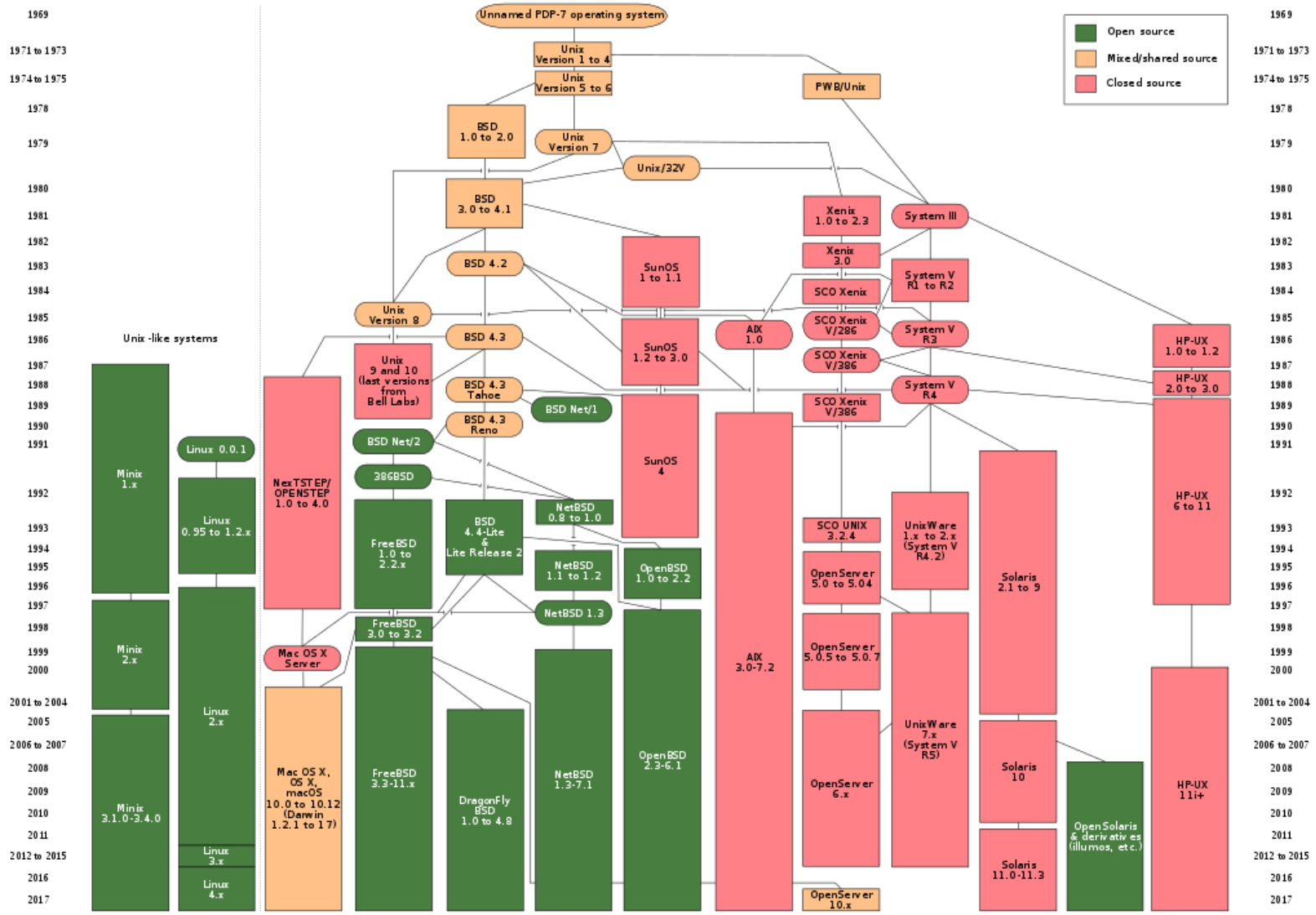
A Brief Look Back at the History of FreeBSD

1969

UNIX

In 1969 Ken Thompson, Dennis Ritchie and others started working on a program

Evolution of Unix and Unix-like systems



By Eraserhead1, Infinity0, Sav_vas - Levenez Unix History Diagram, Information on the history of IBM's AIX on ibm.com, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=1801948

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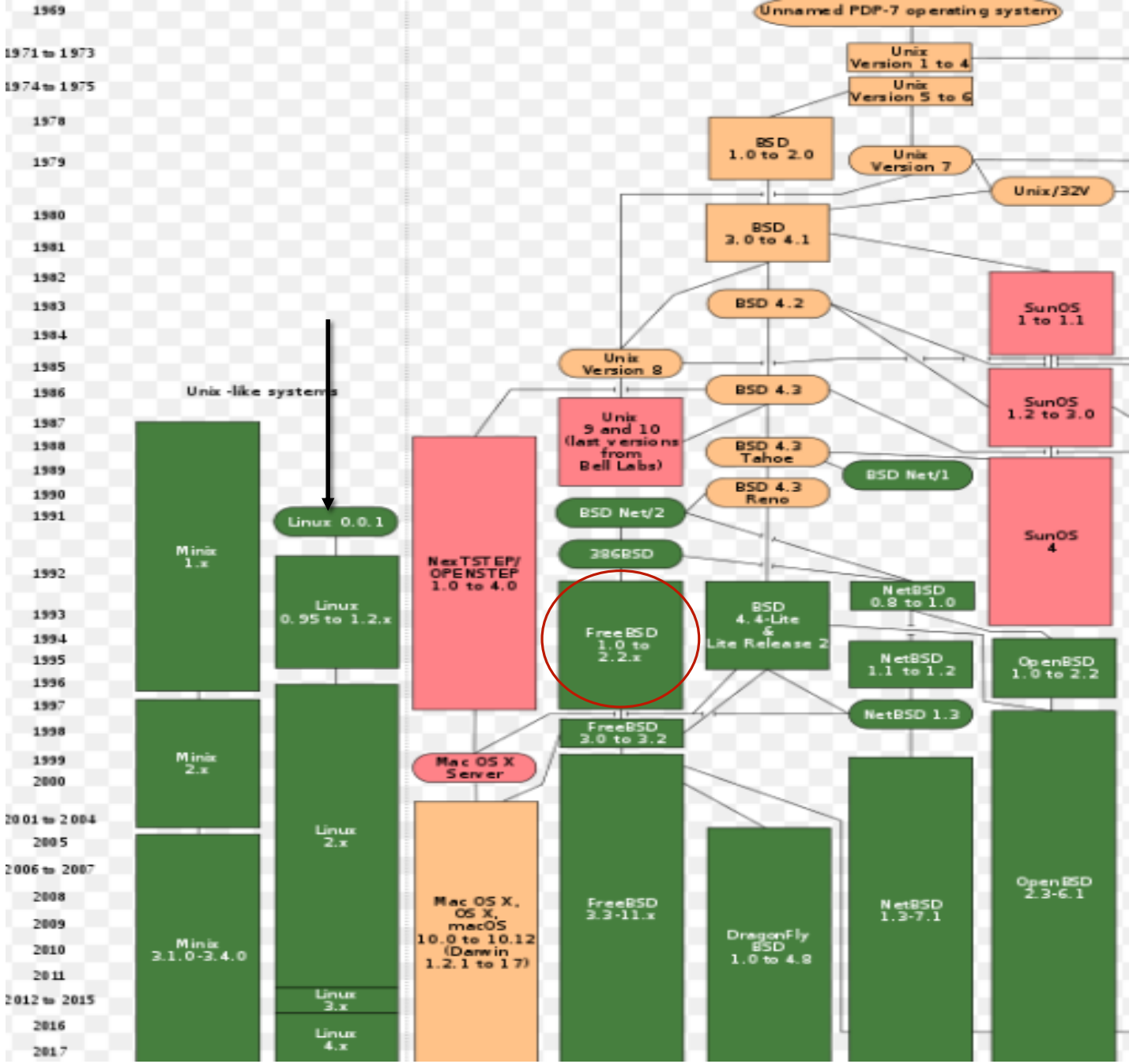
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1971 to 1973
1974 to 1975
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2001 to 2004
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2006 to 2007
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2012 to 2015
2016
2017
Unix -like systems
Unnamed PDP-7 operating system
Unix Version 1 to 4
Unix Version 5 to 6
Unix Version 7
Unix/32V
BSD 1.0 to 2.0
BSD 3.0 to 4.1
BSD 4.2
BSD 4.3
BSD 4.3 Tahoe
BSD 4.3 Reno
Unix Version 8
Unix 9 and 10 (last versions from Bell Labs)
BSD Net/1
BSD Net/2
386BSD
SunOS 1 to 1.1
SunOS 1.2 to 3.0
SunOS 4
Minix 1.x
Minix 2.x
Minix 3.1.0-3.4.0
Linux 0.0.1
Linux 0.95 to 1.2.x
Linux 2.x
Linux 3.x
Linux 4.x
NeXTSTEP/ OPENSTEP 1.0 to 4.0
FreeBSD 1.0 to 2.2.x
BSD 4.4-Lite & Lite Release 2
NetBSD 0.8 to 1.0
NetBSD 1.1 to 1.2
NetBSD 1.3
OpenBSD 1.0 to 2.2
FreeBSD 3.0 to 3.2
Mac OS X Server
Mac OS X, OS X, macOS 10.0 to 10.12 (Darwin 1.2.1 to 17)
FreeBSD 3.3-11.x
DragonFly BSD 1.0 to 4.8
NetBSD 1.3-7.1
OpenBSD 2.3-6.1

Who Uses FreeBSD

Most Likely You Use FreeBSD!

iPhone or Apple computer

Streaming Netflix

NETFLIX

trivago®

Planning your next vacation

Sony PlayStation 4

GROUPON

Getting an awesome deal!

Why Use FreeBSD?

- Friendly and Approachable Community
- Excellent Documentation
- Good Tooling and Modern Compilers
- Consistent Development and Release Processes
- Wide Variety of Architectures Supported
- 2-clause BSD license - Does not restrict what you can do with your own code!
- Secure, Stable, and Reliable

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How the Project Works

Independent of the FreeBSD Foundation

Developer elected 9-person core team

Mentorship for Commit Bit

One community with different functional teams developing system as a whole(core, release engineering, security, ports, documentation,…)

Collaborative Development Environment

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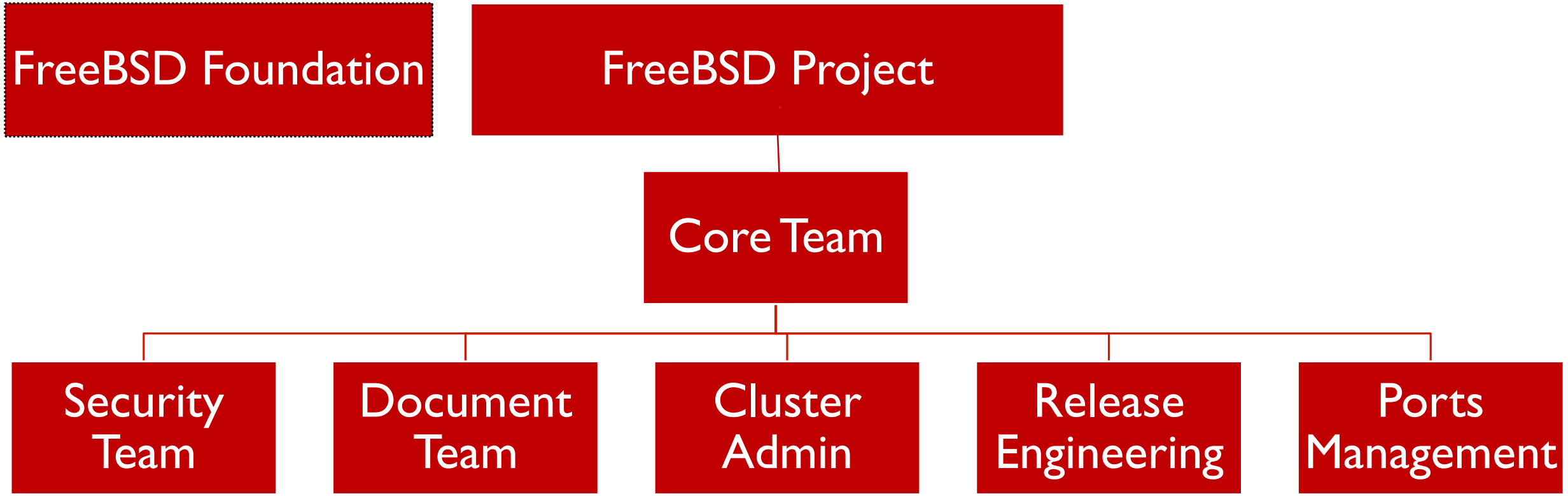
FreeBSD Project Org Chart



Other Teams include:

- Ports secteam
- Security Officer
- Bugmeisters
- Ports Security Team
- Continuous Integration Testing Admins
- Postmaster Team
- Webmaster Team
- Phabricator Code Review Administration

Core Team - 9
Committers - ~400
Contributors - Thousands

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FreeBSD core team

9-member elected management body

- Elections held every two years
- Active committers vote for core members
- Non-voting core team secretary is selected by the core team

Responsibilities

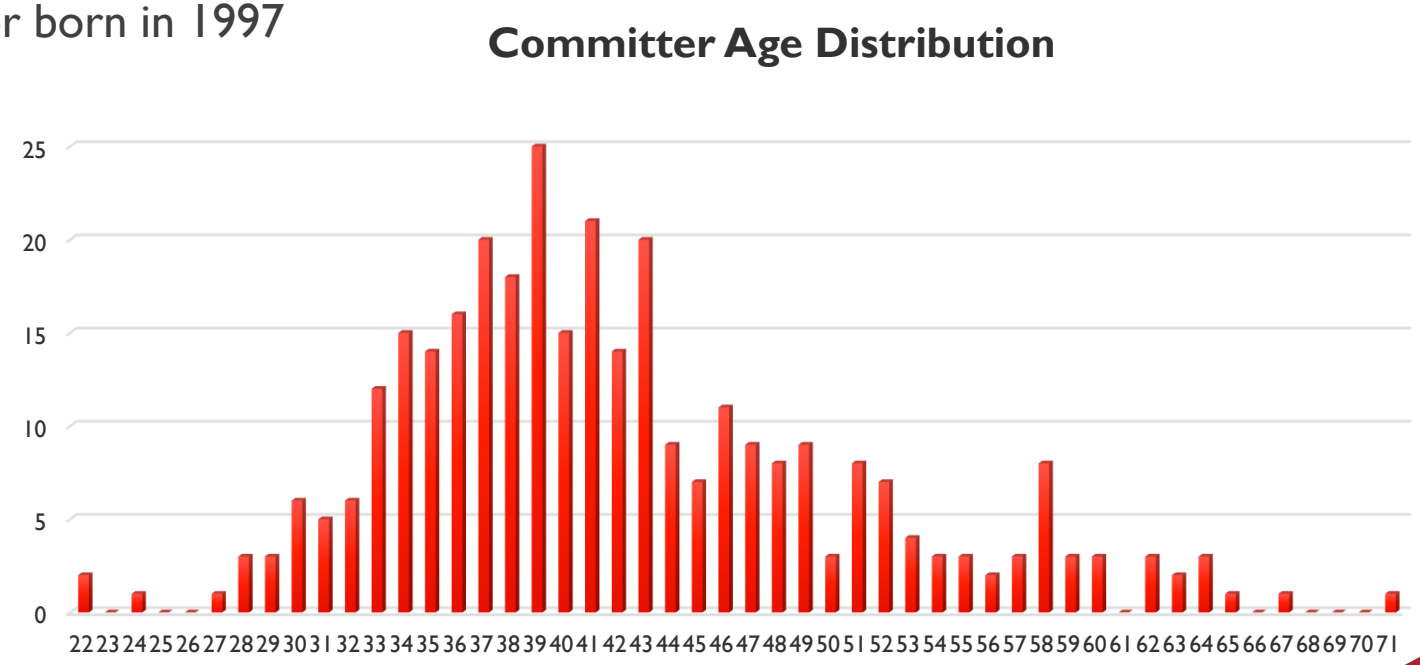
- Administrative (commit bits, hats, team charters)
- Strategic (project direction, coordination, cajoling)
- Rules, conflict resolution, enforcement

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 42
- Data from circa June 2019



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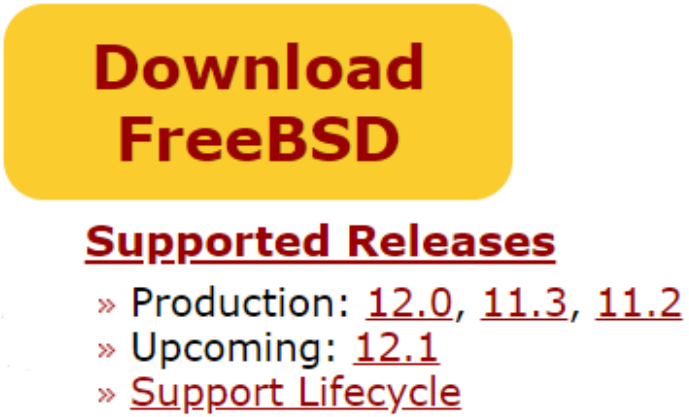
FreeBSD Releases

POLA: Principle Of Least Astonishment
- Don't break things that work
- Upgrades are generally painless
- Even across major releases



Two types of releases:

Major Release (Dot Release) – 12.0 - Around every two years (supported for 5 years)

Point Release – 11.3 Around every 9 months – ABI/API compatibility

Two types of branches:

Current – Head – All changes to base system committed here. Dot releases built from here.

Stable – After testing, most changes in current moved here. Point releases built from stable.

Weekly snapshots available for current and stable branches

How to Contribute to FreeBSD

Code, writing documentation, maintaining ports, and advocacy.

Easy to get started contributing.

Some Suggestions:

- Start by translating or improving our documentation
- Pick one of the many ports to maintain or add
- Go through the PR list and fix some bugs

New to FreeBSD?

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Why Companies Use FreeBSD?

- History of innovation
- High performance
- Great tools
- ABI stability within major releases – Remember POLA
- Mature release model
- Excellent documentation
- Business Friendly License
- ZFS
- Open community
- Smaller footprint than most operating systems

"We choose FreeBSD for many of our internal services and product service offerings because we know we can rely on its consistent reliability and performance. Its portability not only allows us to run it on almost any commodity or enterprise server, but allows for the possibility to move a hard drive from one server to another, boot, and get back to normal operation with minimal fuss."

Where FreeBSD Stands Out

- Embedded Systems
- Video CDN/Streaming
- Security
- Research
- Storage
- Virtualization
- Networking
- High Performance
- Data Centers
- Servers
- ISPs

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Kernel features

Multi-processing multi-threaded kernel

Support for many popular hardware architectures:
Intel/AMD x86/64, 32- and 64-bit ARM, RISC-V, *PowerPC, MIPS*

UNIX, POSIX, BSD programming interfaces

Multi-protocol network stack
- *IPv4, IPv6, IPX/SPX, AppleTalk, IPSEC, ATM, Bluetooth, IEEE 802.11, SCTP,…*
- Reference implementation for many protocols

Unified, coherent build-system across components

Extensive documentation

Userland features

Complete, integrated Unix system

- Expected tools are in the base installation – no extra packages needed
- Build-time knobs to trim the system down for appliances

Kernel and userland maintained together

- Userland is always in sync with the kernel
- New kernel features are immediately available in userland

Strong focus on consistency

Other Features

- **Robust file systems** including UFS and ZFS (Active work happening on ZFS)

- **DTrace** - an advanced event-based performance analysis and troubleshooting tool. DTrace can help you identify and quantify the root cause of virtually any performance issue, in both user-level and kernel code. It can be executed using custom and powerful one-liners and scripts.

- **Jails** – Lightweight virtualization added to FreeBSD in the early 2000s.

- **bhyve** – Full-blown hypervisor. This hypervisor supports a number of guests, including FreeBSD, OpenBSD, Microsoft Windows, and many Linux distributions.

- **TCP/IP** was originally developed on BSD and FreeBSD remains the reference implementation for several network protocols.

- **Capsicum** – Capsicum is a lightweight OS capability and sandbox framework developed at the University of Cambridge Computer Laboratory. Capsicum extends the POSIX API, providing several new OS primitives **to support object-capability security** on UNIX-like operating systems

The FreeBSD Foundation

Founded in March 2000

501(c)3 (non-profit public charity)

Based in Boulder, Colorado

100% Funded by donations

Separate from the FreeBSD Project

Support critical needs of Project

20TH ANNIVERSARY
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FreeBSD Advocacy

We attended and participated in 38 conferences and events in 21 countries

FOSDEM - Table, presentations

SANOG33 in Thimphu, Bhutan - Presentation

APRICOT 2019 in Yuseong-gu, Daejeon South Korea

SCaLE 17x - Los Angeles, CA Workshop and table

FOSSASIA - Singapore - Presented and table Sponsored AsiaBSDCon 2019

AsiaBSDCon - Tokyo, Japan Developer Summit

LinuxFest Northwest In Bellingham, Washington - Table

BSDCan - Ottawa, Canada - FreeBSD Developer Summit

Vienna, Austria FreeBSD Security Hackathon

COPU in Beijing, China

HKOSCON in Hong Kong, Presented

Berlin, Germany - FreeBSD Developers Summit

Comcast Labs Connect Open Source Conference in Denver, CO - Presented

RootConf 2019 in Bangalore, India - presented and table

OSCON 2019 in Portland OR - table

FOSSCON 2019 in Philadelphia, PA - table

FrOSCon in Bonn Germany - Presented

SANOG34 in Kolkata - Taught workshop

Open Source Summit North American in San Diego, CA - Presented

COCSUP 2019 in Taipei, Taiwan - Presentations and table

vBSDCon in Reston, VA - FreeBSD Developer Summit

Bay Area FreeBSD Vendor and Developers Summit in Santa Clara, CA

APNIC-48 in Chiang Mai, Thailand - Represented

MNNOG-1 in Ulaanbaatar, Mongolia - Represented

COSCON'19 in Shanghai, China - Presented

All Things Open 2019, Raleigh, North Carolina - Table

School of Mines in Golden, CO - Presentation

Seagl in Seattle, WA - Presentation and table

Open Source Summit Europe in Lyon France - Present

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Upcoming Events

APRICOT 2020
February 12-21, 2020
Melbourne, Australia

SCALE 18x
March. 5-8, 2020
Pasadena, CA, USA

FOSSASIA Summit 2018
March 19-22, 2020
Singapore, Singapore

AsiaBSDCon 2020 & Dev Summit
March 19-22, 2020
Tokyo, Japan

BSDCan and Dev Summit
June 2-6, 2020,
Ottawa, Canada

OSCON 2020
July 13-16, 2020
Portland, OR, USA

Colorado FreeBSD Dev Summit
TBD July 2020
Boulder, CO, USA

EuroBSDCon and Dev Summit
September 17-20, 2020
Vienna, Austria

All Things Open 2020
October 18-20, 2020
Raleigh, North Carolina, USA

Bay Area FreeBSD Vendors Summit
TBD Fall 2020
Bay Area, California, USA

USENIX LISA20
December 7-9, 2020
Boston, MA, USA

What Can You Do?

Give an introduction to FreeBSD at an open source conference by you, at a meetup, at a university

Hold an installfest at a local meetup or university

Promote why you use/love FreeBSD

Find resources at: https://www.freebsdfoundation.org/about/resources/

Marketing Literature

- FreeBSD 10 Brochure
- Get Involved Brochure
- Send Us Your Testimonials Flyer
- Your Donation Counts Flyer
- Recruiting Half-Page Flyer
- TeachBSD Postcard
- Google Summer of Code Info Flyer
- Donation Letter Template
- FreeBSD Sticker
- Powered by FreeBSD mini sticker
- FreeBSD Journal Subscribe ad – full page
- FreeBSD Journal Subscribe ad – half page
- Support FreeBSD – Foundation ad – full page
- Support FreeBSD – Foundation ad – half page
- FreeBSD Project Logo
- FreeBSD Foundation Logo

Why We Should Work Together?

May work on multiple operating systems during your employment

Learn from each other. We both have successes and failures.

Different coding methodologies and philosophies – Understanding the reasons for both.

FreeBSD's smaller code base makes it a great reference platform.

"Using and learning FreeBSD made me a better Linux admin and systems engineer."

Why Contribute to FreeBSD

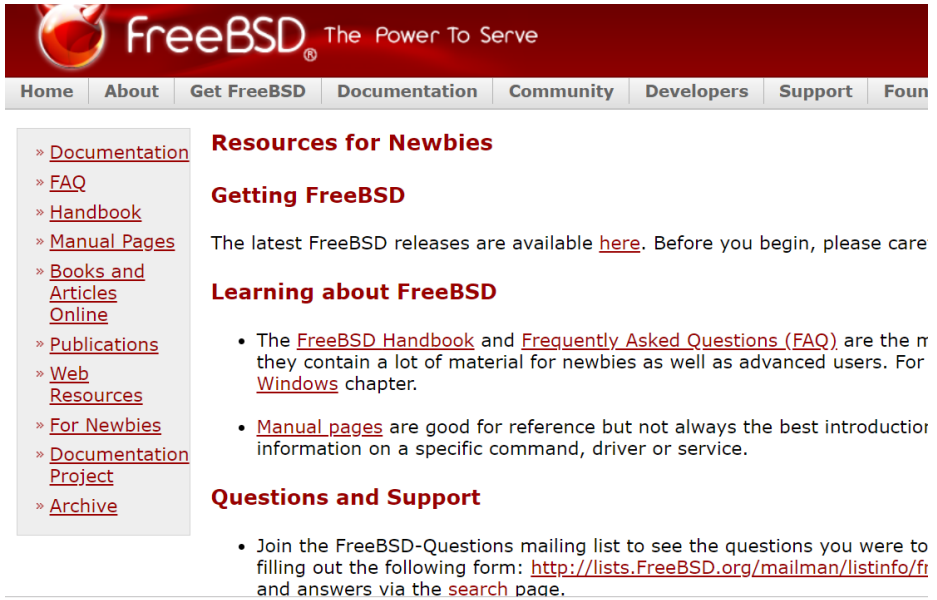
- Be part of an inclusive and welcoming community with a strong mentoring culture

- Great way to learn systems programming and study operating systems.

- The size of the project allows for a greater chance for anyone to
- make a notable impact.

- Some of the most notable BSD and FreeBSD Founders are still involved in the Project – And, they are approachable!

- Democratically run open source project allowing committers to commit their changes directly to the source tree without having to go through hierarchy of lieutenant model.



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Get your hands dirty!

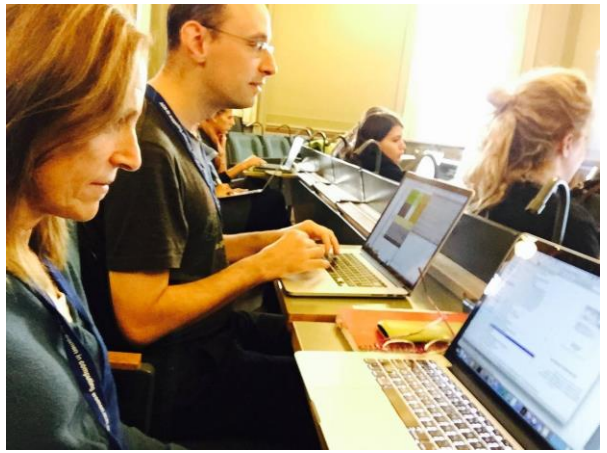
FreeBSD images available from all major cloud providers

- Amazon AWS
- Microsoft Azure
- Digital Ocean
- Gandi
- Vagrant
- Etc…

Or install in VMware / VirtualBox / …

https://www.FreeBSD.org/where.html

Download FreeBSD



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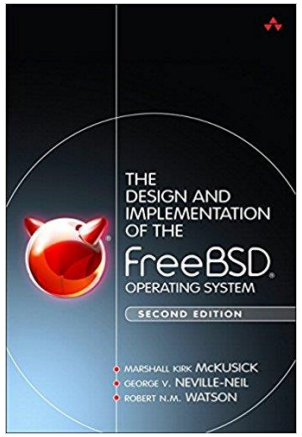
Resources



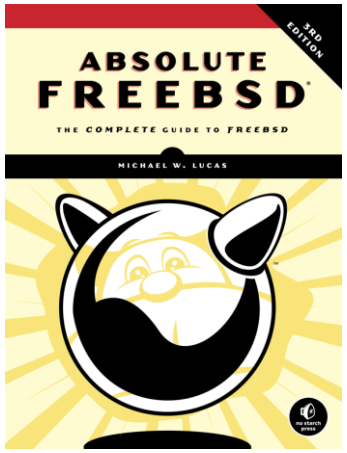
Mailing Lists
Forums, Mailing Lists, IRC and Events (https://www.freebsd.org/community.html)

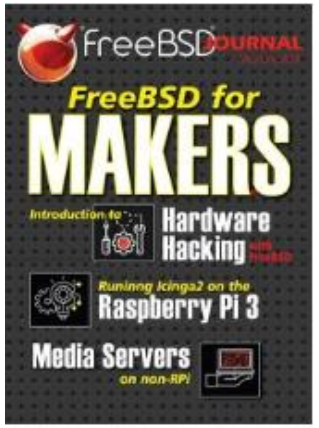
Contributing to FreeBSD
(https://www.freebsd.org/doc/en_US.ISO8859-1/articles/contributing/)

FreeBSD Handbook
https://www.freebsd.org/doc/handbook/book.html

History
https://www.mckusick.com/history/

Forums:
http://forums.freebsd.org/





https://www.freebsdfoundation.org/journal/

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