FreeBSD Around the World!

Deb Goodkin – Executive Director
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?
What is FreeBSD?

It’s not a Linux Distribution!
What's your favorite **Linux** distribution?

- Arch
- CentOS
- Debian
- Elementary
- Fedora
- FreeBSD
- Kali
- Manjaro
- Mint
- MX Linux
- openSUSE
- PCLinuxOS
- Pop!_OS
- Ubuntu
- Zorin

- I can't believe you didn't include _______ as a choice

Vote
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.
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
Abridged BSD Family Tree

AT&T
Unix

BSD

FreeBSD

NetBSD
In 1969 Ken Thompson, Dennis Ritchie and others started working on a program that utilized the full
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
Who Uses FreeBSD
Most Likely You Use FreeBSD!

- iPhone or Apple computer
- Streaming Netflix
- Planning your next vacation
- Sony PlayStation 4
- 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
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
FreeBSD Project

Core Team

Security Team

Document Team

Cluster Admin

Release Engineering

Ports Management

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
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

Committer Age Distribution
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

Download FreeBSD

**Supported Releases**
- Production: 12.0, 11.3, 11.2
- Upcoming: 12.1
- Support Lifecycle
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

deb@freebsdfoundation.org
@dgoodkin
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
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
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
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/](https://www.freebsdfoundation.org/about/resources/)
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.
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
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

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

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

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