The FreeBSD Project

A short introduction

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What is FreeBSD ?

- A modern, open-source, complete, permissively-licensed BSD Unix distribution

- .. put together by a large open-source community

- http://www.freebsd.org

Early History

- The FreeBSD Project started in 1992

  - "Berkeley System Distribution" dates back to '78

    - Foundation for much of 80's commercial Unix (SunOS, DEC Ultrix etc)

  - Perfect storm of Intel/386 h/w, internet collaboration and BSD source access in early 90s led to 386BSD (and Minix/Linux)

  - BSD386 unmaintained leading to patch sets, leading to FreeBSD

- Legal issues led to rebase on the "last" BSD/CSRG release: 4.4-lite2

- Original BSD/CSRG folk still involved (McKusick, Karels)

Modern History

- Disruptive project issues in the late 90's

- Led to the creation of

  - a 9-member elected core team; 2-year terms.

  - project by-laws and a formal committer process

  - The FreeBSD Foundation

- Used as the basis for many commercial products

  - Playstation 4, NetApp, WhatsApp, Juniper, Dell/EMC Isilon …

- Initial i386 focus relaxed: ports to Alpha/ARM/MIPS/PPC/Sparc/x64

The FreeBSD Foundation

- http://www.freebsdfoundation.org

- 501(c)3 charitable non-profit that "supports the project"

  - Hands-off; no involvement in running the project

- Provides a legal entity

  - Trademark ownership/protection

  - Donations

- Sponsors work/conference/travel/marketing/equipment

- Small number of full-time employees that do project work

- Working budget ~$1M/year

User's perspective

- www.freebsd.org landing page

- Formal installable binary releases, separate 3rd-party binary packages

  - ISOs/memstick/VM images

- Major releases every 18-24 months

  - Latest release: 10.2

  - Point releases 4-6 months

  - https://www.freebsd.org/releng/

- Weekly snapshots

- Quarterly package builds

  - ~24,000 packages

Developer's Perspective

- Hosted Subversion repository

  - exported to github and other git hosting sites

- Self-contained build system

  - Almost entirely C. Amounts of c++, /bin/sh, awk and make.

  - Uses the BSD-licensed clang/llvm toolchain

- Full documentation

- mailing lists, irc and slack for communication

- Bugzilla

- Phabricator for code reviews

More development

- Development done in mainline aka CURRENT

  - Features/fixes "MFC'd" (move-from-current) to STABLE branches as needed

  - Branches for feature development/exploration/etc.

- releng team decides when to cut releases, and vet commits/fixes prior to a release with a progressive freeze

- Only "committers" have write-access to the repo

Commit privileges

- Formal 'team member'

- Provides:

  - Repo write-access; SSH login to dev cluster; project email address

- Have to be proposed to the core team by an existing committer.

  - Need a track record of technical ability and positive community involvement.

  - Requires 'mentorship' from an existing committer for an amount of time.

- Low numbers of new committers - possibly a problem for the project.

  - ~350 active committers, 200 of those "src"

Differences to Linux dev

- Direct commit as opposed to maintainer-mediated

- Less distributed, perhaps due to VCS evolution

- Faster to get code to end-users (maybe).

- Kernel ABI stability within a major release

- Combined user+kernel releases

- Still significant numbers of volunteers

- Smaller community (good and bad)

How to get involved

- Install a release or snapshot (www.freebsd.org/where.html)

- Subscribe to lists

    - freebsd-current@freebsd.org

    - Subsystem-specific e.g. freebsd-net

- Ask questions/get involved in discussions

- Read the book: "Design and Implementation of the FreeBSD Operating System"

- Submit bug reports, patches, or reviews

- Eventually become a committer :)

Questions ?