

FREEBSD

A (LITE) INTRODUCTION

Presented by [Giorgio Arcamone](#)

ABOUT ME

- Systems Engineer at Datto
- PHP enthusiast
- Open Source user for 15+ years
- I like Elephants



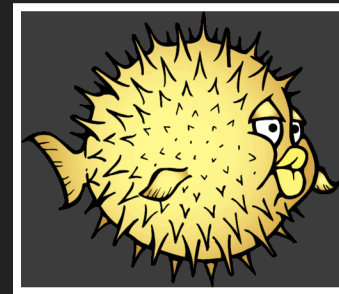
ABOUT THE BSDS

- BSD is the Berkeley Software Distribution
- An open source compilation of tools to compliment AT&T Unix
- Named for its origins at UC Berkeley
- Not a full OS, until 386BSD

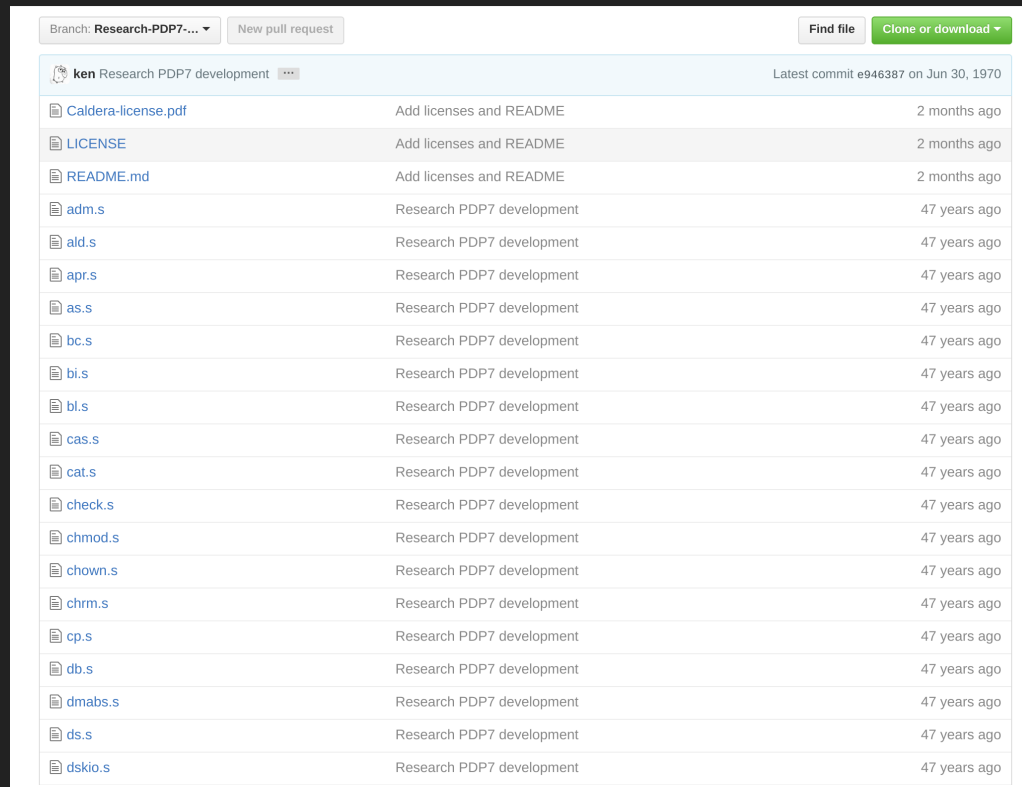


THERE'S MORE THAN ONE BSD

- FreeBSD
- NetBSD
- OpenBSD
- Plenty of others
- Today's about FreeBSD



BUT THIS ISN'T A HISTORY LESSON



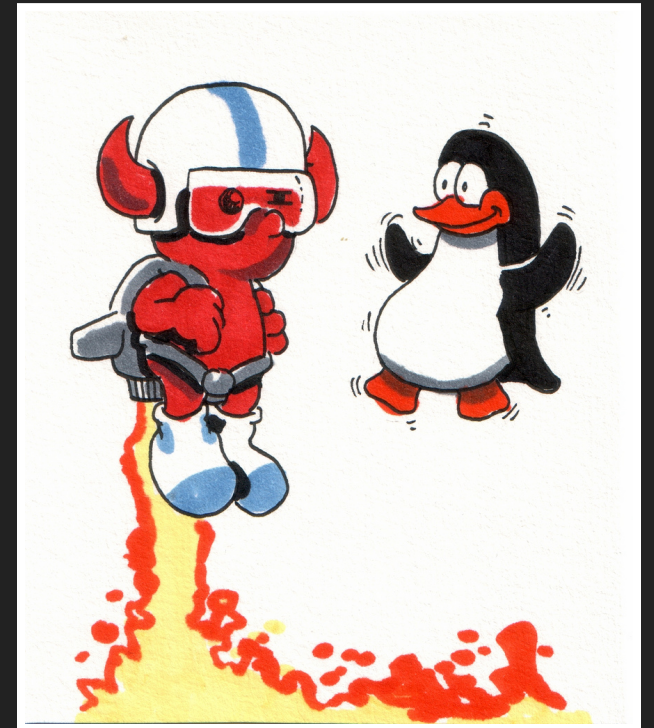
The screenshot shows a GitHub repository interface. At the top, there's a header with 'Branch: Research-PDP7-...' and a 'New pull request' button. Below this, the repository name 'ken Research PDP7 development' is displayed, along with the latest commit 'e946387 on Jun 30, 1970'. The main content is a table listing files and their commit history.

File	Commit Message	Time Ago
Caldera-license.pdf	Add licenses and README	2 months ago
LICENSE	Add licenses and README	2 months ago
README.md	Add licenses and README	2 months ago
adm.s	Research PDP7 development	47 years ago
ald.s	Research PDP7 development	47 years ago
apr.s	Research PDP7 development	47 years ago
as.s	Research PDP7 development	47 years ago
bc.s	Research PDP7 development	47 years ago
bi.s	Research PDP7 development	47 years ago
bl.s	Research PDP7 development	47 years ago
cas.s	Research PDP7 development	47 years ago
cat.s	Research PDP7 development	47 years ago
check.s	Research PDP7 development	47 years ago
chmod.s	Research PDP7 development	47 years ago
chown.s	Research PDP7 development	47 years ago
chrm.s	Research PDP7 development	47 years ago
cp.s	Research PDP7 development	47 years ago
db.s	Research PDP7 development	47 years ago
dmabs.s	Research PDP7 development	47 years ago
ds.s	Research PDP7 development	47 years ago
dskio.s	Research PDP7 development	47 years ago

[GITHUB.COM/DSPINELLIS/UNIX-HISTORY-REPO](https://github.com/dspinellis/unix-history-repo)

WHAT'S THIS GOT TO DO WITH LINUX

- BSD and Linux aren't rivals
- More like cousins
- Similar goals and uses



A FEW LINUX DISTROS EVEN OFFER BSD VARIANTS



There's others too, like UbuntuBSD and PacBSD, but those don't have cool logos

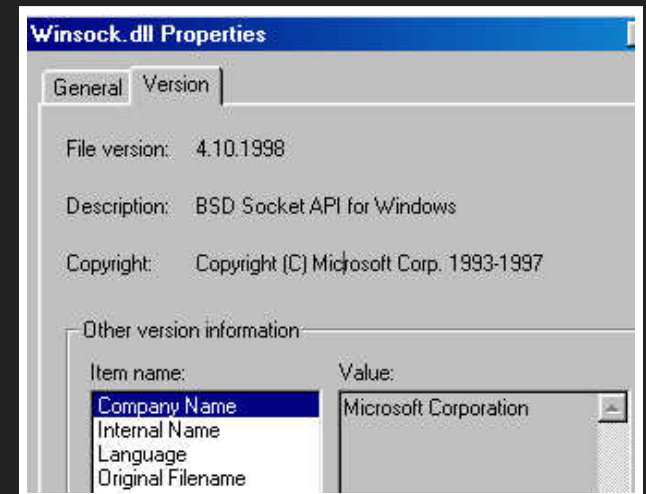
WHY USE FREEBSD

- Robust networking support
- Excellent OpenZFS support
- OS-level virtualization via Jails
- Growing hypervisor support



NETWORKING

- BSD Sockets
- Reference implementation, POSIX standard
- Even used in Windows for a while!



INCREDIBLE NETWORK PERFORMANCE

Facebook Seeks Devs To Make Linux Network Stack As Good As FreeBSD's



195

Posted by timothy on Wednesday August 06, 2014 @12:30PM from the high-praise-all-around dept.

An anonymous reader writes

Facebook posted a career application which, in their own words is 'seeking a Linux Kernel Software Engineer to join our Kernel team, with a primary focus on the networking subsystem. Our goal over the next few years is [for the Linux kernel network stack to rival or exceed that of FreeBSD.](#)'

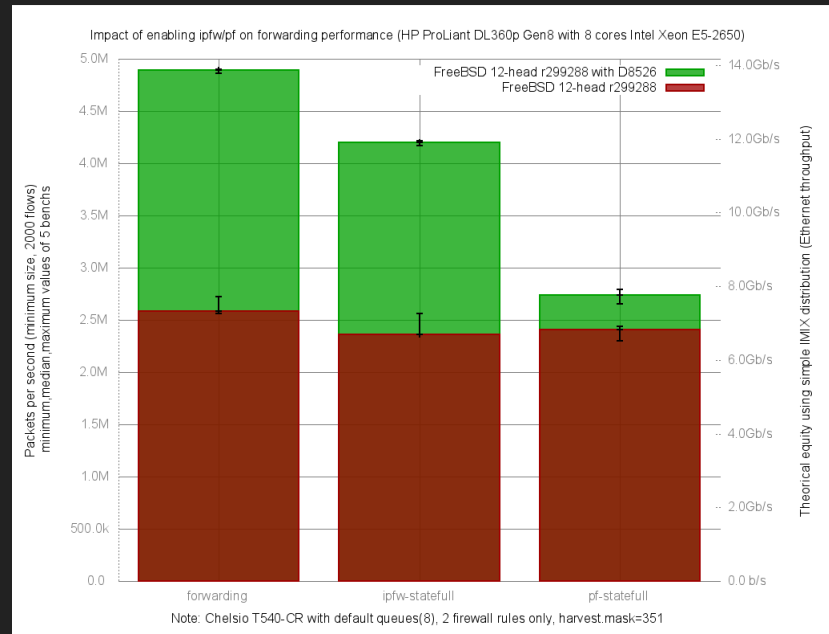
Two interesting bullet points listing "responsibilities":

- Improve IPv6 support in the kernel, and eliminate perf and stability issues. FB is one of the worlds largest IPv6 deployments; Investigate and participate in emerging protocols (MPTCP, QUIC, etc) discussions, implementation, experimentation, tooling, etc.

"Facebook seeks devs to make Linux network stack as good
as FreeBSD's"

<https://bsd.slashdot.org/story/14/08/06/1731218/facebook-seeks-devs-to-make-linux-network-stack-as-good-as-freebsds>


IT CONTINUES TO IMPROVE, TOO



Yandex recently submitted a patch nearly doubling packet forwarding performance

<https://reviews.freebsd.org/rS309257>

AND CONTINUES..

 Import the 'iflib' API library for network drivers. From the author:

rS300113

Actions

Tags

None

Subscribers

None

Description

Import the 'iflib' API library for network drivers. From the author:

"iflib is a library to eliminate the need for frequently duplicated device independent logic propagated (poorly) across many network drivers."

Participation is purely optional. The IFLIB kernel config option is provided for drivers that want to transition between legacy and iflib modes of operation. ixl and ixgbe driver conversions will be committed shortly. We hope to see participation from the Broadcom and maybe Chelsio drivers in the near future.

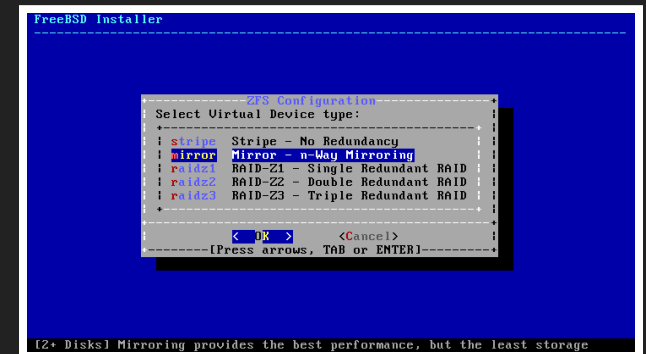
Submitted by: mmacy@nextbsd.org
Reviewed by: gallatin
Differential Revision: **D5211**

Iflib - an API to enable network vendors to make higher quality drivers

<https://reviews.freebsd.org/rS300113>

OPENZFS

- FreeBSD has tight integration with OpenZFS
- Plenty of tools (can) take advantage of this
- Poudriere, locage, lohyve, etc..
- Can even have a zpool for the OS!



JAILS

- FreeBSD has had OS-level virtualization for 16 years!
- Chroot on steroids
- Can be used to isolate services
- Tons of tools to simplify this -- ezjail, iocage, etc



JAILS

- Jails are really powerful
- ZFS + Base Image Jail = Easy updating
- Can be nested -- "Hierarchical jails"
- Can run Linux inside of one, too



PACKAGING

- Ports: Built-from-source packages
 - Fully-automated builds via Makefiles
 - Served as inspiration for similar systems like Gentoo's ebuild
- Pkg: Binary packages
 - Easily distributable, just like debs and rpms
- Can mix and match



COMBINING PORTS AND PKG - POUDRIERE

- French for Powder Keg
- Flexibility of Ports at scale
- Can build pkgs from ports for different archs / releases
- Jails + ZFS of course
- Even has a Web Interface for monitoring the build process
- Just like adding a repo to apt



Adm: 17.04.2018 10:10
Build: 2018-04-22 10:10:20
URL: https://www.poudriere.org/ports/head/2018/04

Total: 2018
Build: 2018
Failed: 0
Skipped: 0
Ignored: 0
To build: 0/10

Builders

ID	Origin	Status
01	make/translation	build
02	dev/translation	build
03	lang/translation	build
04	games/translation	build
05	media/translation	build
06	lang/translation	build
07	all/translation	build
08	translation	build
09	translation	build
10	translation	build
11	translation	build
12	translation	build
13	translation	build

Built ports

Package	Origin	Log
pkg-1.2.4_1	ports/maintain	logfile
pkg-devel-1.2.4_1	ports/maintain-devel	logfile
pkg-devel-0.12_1	dev/translation	logfile
pkg-1.2	net/translation	logfile
pkg-devel-1.1.3	dev/translation	logfile
pkg-devel-1.0	ports/maintain	logfile
pkg-devel-3.0	ports/maintain	logfile
pkg-devel-2.1.1	ports/maintain	logfile
pkg-devel-1.0.20180401_1	ports/maintain	logfile
pkg-devel-1.8	ports/maintain	logfile

Showing 1 to 10 of 13,129 entries

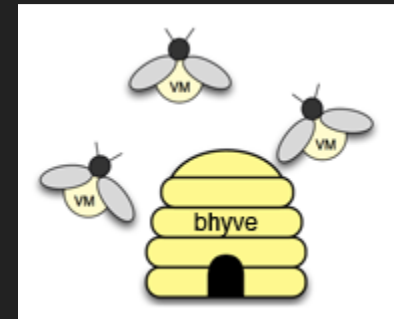
Failed ports

Package	Origin	Phase	Skipped	Log
pkg-0.4.6	ports/maintain	2	0	logfile

Showing 1 to 10 of 13,129 entries

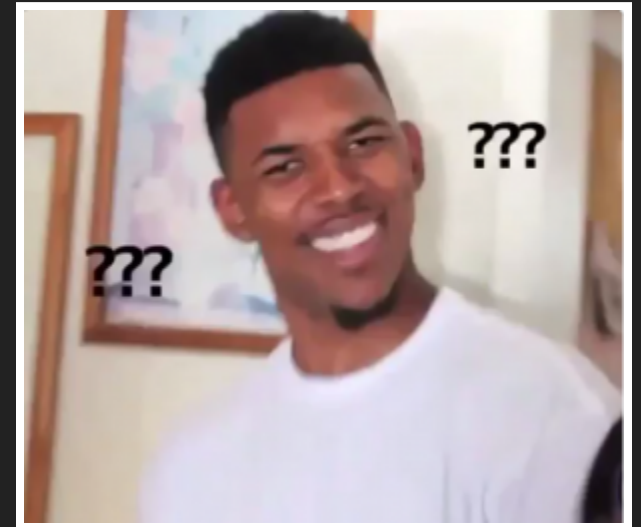
BHYVE

- Jails are cool, but what about full VMs?
- Virtualbox kinda sucks
- Enter bhyve, the bsd hypervisor
- BSD + Linux and Windows
- VNC support + UEFI
- Consoles can be attached into tmux



SHORTCOMINGS

- Lots of growth and innovation
- But there are some weaknesses
- Hardware support is less broad
- Desktop needs more love
- Linuxisms



QUESTIONS?

