# FREEBSD

## A (LITE) INTRODUCTION

Presented by Giorgio Arcamone

# ABOUT ME

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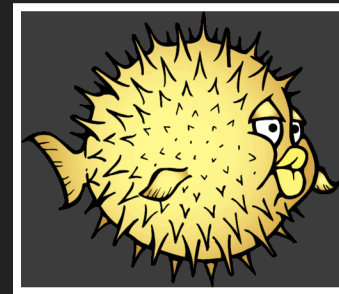- I like Elephants

# 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
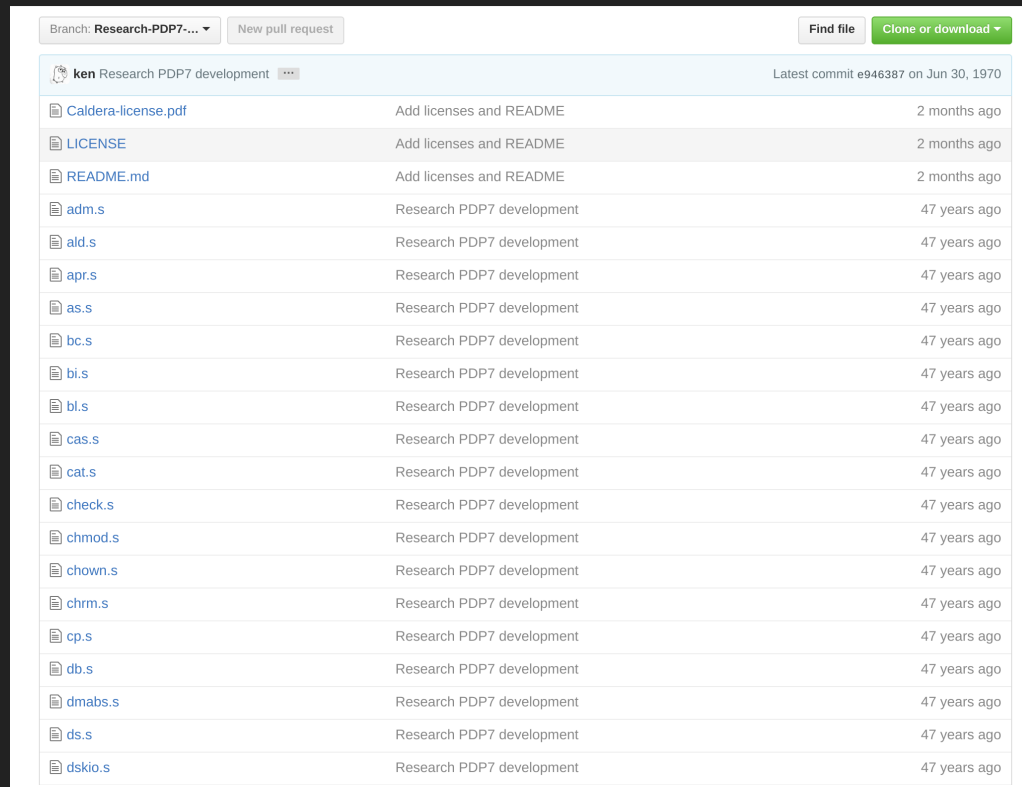- Not a full OS, until 386BSD

# THERE'S MORE THAN ONE BSD

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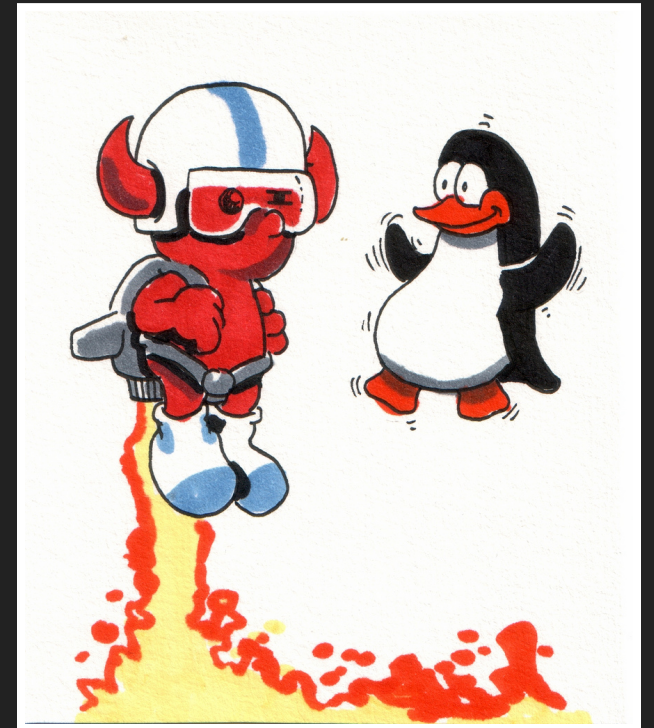- Today's about FreeBSD

# BUT THIS ISN'T A HISTORY LESSON



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
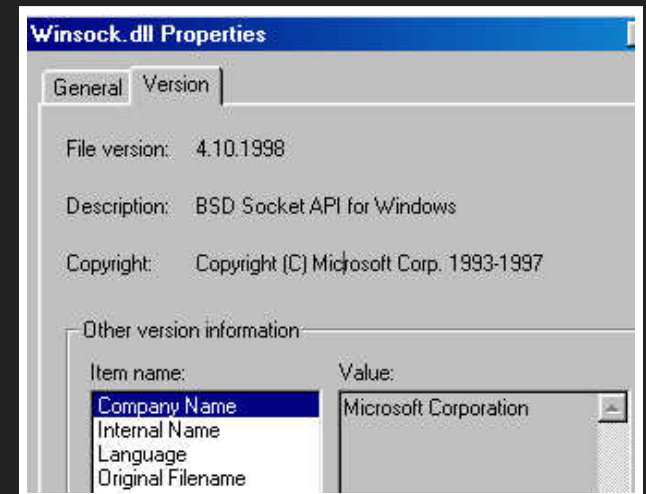
# WHY USE FREEBSD

- 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**

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.'
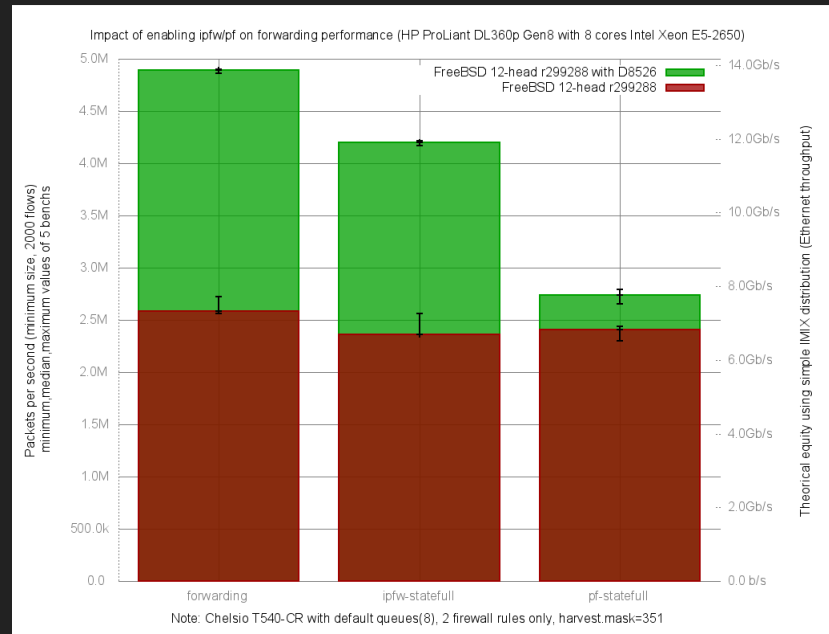
Two interesting bullet points listing "responsibilities":

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



Impact of enabling ipfw/pf on forwarding performance (HP ProLiant DL360p Gen8 with 8 cores Intel Xeon E5-2650)

Yandex recently submitted a patch nearly doubling packet forwarding performance
https://reviews.freebsd.org/rS309257

# AND CONTINUES..



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, Iocage, Iohyve, etc..
- Can even have a zpool for the OS!
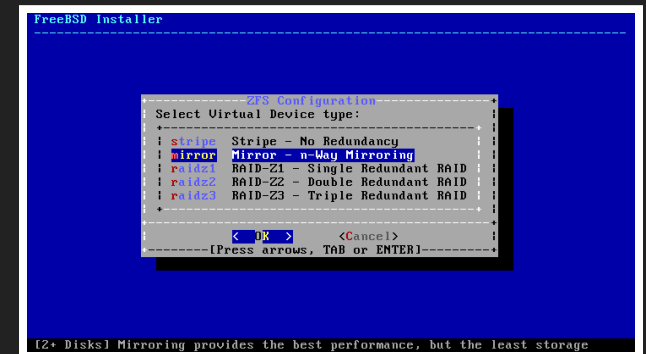
# JAILS

- 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
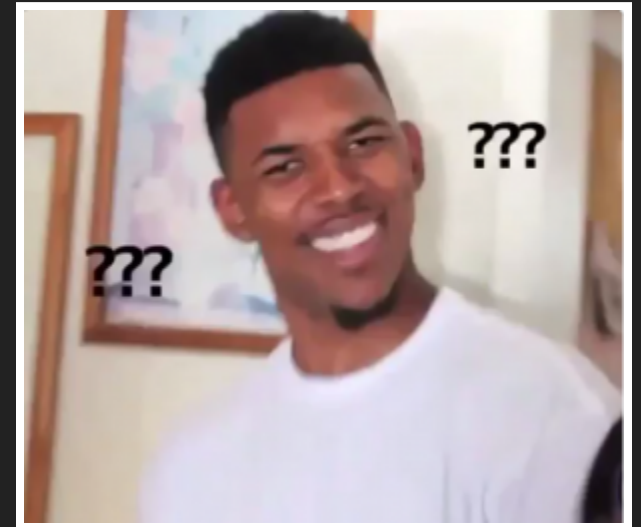
# BHYVE

- 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
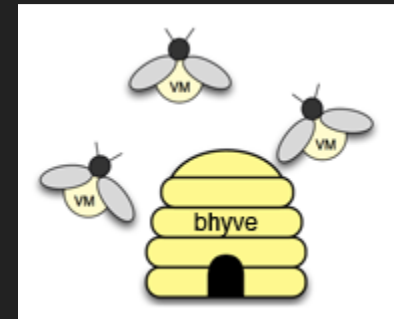
# SHORTCOMINGS

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

# QUESTIONS?