

FreeBSD: Not a Linux Distro

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Overview



- ▶ What is FreeBSD?
- ▶ A Brief History of BSD
- ▶ Features
- ▶ Futures

Existential Background



- ▶ Network Protocol and Security Practitioner
- ▶ Twenty year veteran of BSDs and Operating Systems in general
- ▶ Coauthor of *The Design and Implementation of the FreeBSD Operating System*
- ▶ Member of FreeBSD's Elected Core Team
- ▶ Director of the FreeBSD Foundation
- ▶ ACM Queue's Kode Vicious

What is FreeBSD?



- ▶ Complete Operating System
- ▶ Tools and Source
- ▶ More than 24,000 3rd Party Open Source Packages
- ▶ Complete Documentation
- ▶ An Open Source Community

Who uses FreeBSD?



- ▶ NetApp
- ▶ EMC/Isilon
- ▶ Dell/KACE
- ▶ Panasas
- ▶ Apple
- ▶ Limelight Networks
- ▶ Norse
- ▶ Swisscom
- ▶ Sentex
- ▶ WhatsApp
- ▶ Juniper Networks
- ▶ Verisign
- ▶ Perseus Telecom
- ▶ Sony
- ▶ Hudson River Trading
- ▶ McAfee
- ▶ NYI
- ▶ Yahoo

Why?



- ▶ History of innovation
- ▶ Great Tools
- ▶ Mature release model
- ▶ Documentation
- ▶ Business Friendly License

History: 30+ years in 3 minutes

- ▶ Chaos reigned
- ▶ MULTICS
- ▶ UNIX (Bell Labs)
- ▶ Berkeley Tools Tapes
 - ▶ ex/vi
 - ▶ Pascal Compiler
 - ▶ Tools for UNIX
- ▶ CSRG, DARPA and the Internet
- ▶ Removal of last bits of AT&T Code
- ▶ Rewrite of all non open source code
- ▶ AT&T Lawsuit
- ▶ BSD is Free

Flavors and Branch Dates

- NetBSD Broad platforms support (1993)
- FreeBSD Rock Solid Performance (1993)
- OpenBSD Security (1996)
- PC-BSD Desktop (2006)

The FreeBSD Philosophy



- ▶ Don't Sue Us
- ▶ Use our code
- ▶ Produce a whole system ready for development

Produce a Whole System



- ▶ Operating System
- ▶ Drivers
- ▶ Compilers and associated Tools
- ▶ Debugging Tools
- ▶ Editors
- ▶ Packaging System
- ▶ Ready for Coding when Install is Done

Some Recent Features and Innovations

- ▶ UFS2
- ▶ ZFS
- ▶ DTrace
- ▶ VNet
- ▶ Jails
- ▶ LLVM/Clang/LLDB
- ▶ Capsicum
- ▶ MAC Framework
- ▶ netmap/VALE
- ▶ Linuxulator

Filesystems



- ▶ UFS
 - ▶ Traditional Unix Filesystem
 - ▶ High Performance
 - ▶ Snapshots
 - ▶ Journaled Soft Updates
- ▶ ZFS
 - ▶ Zetabyte Filesystem
 - ▶ Volume Manager
 - ▶ RAID
 - ▶ Fully up to date in FreeBSD

Security Features



- ▶ Jails
- ▶ MAC Framework
- ▶ Capsicum

Tools



- ▶ LLVM/Clang
- ▶ LLDB
- ▶ DTrace

- ▶ Complete system transparency
- ▶ See inside any call or return
- ▶ System Calls
- ▶ Disk, NFS, Networking subsystems
- ▶ DTrace Toolkit

Networking



- ▶ IPFW and PF
- ▶ Dummynet
- ▶ netmap
- ▶ VALE
- ▶ VXLAN

Up Next



- ▶ Scaling
 - ▶ Cores
 - ▶ Queues
 - ▶ NUMA
- ▶ ARM64
- ▶ Virtualization Features
- ▶ MPTCP
- ▶ DCTCP
- ▶ Secure Boot/UEFI

Where to now?



- ▶ Website: www.freebsd.org
- ▶ FreeBSD Foundation: www.freebsd.foundation.org
- ▶ Mailing Lists
- ▶ Forums
- ▶ FreeBSD Handbook

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