

Welcome

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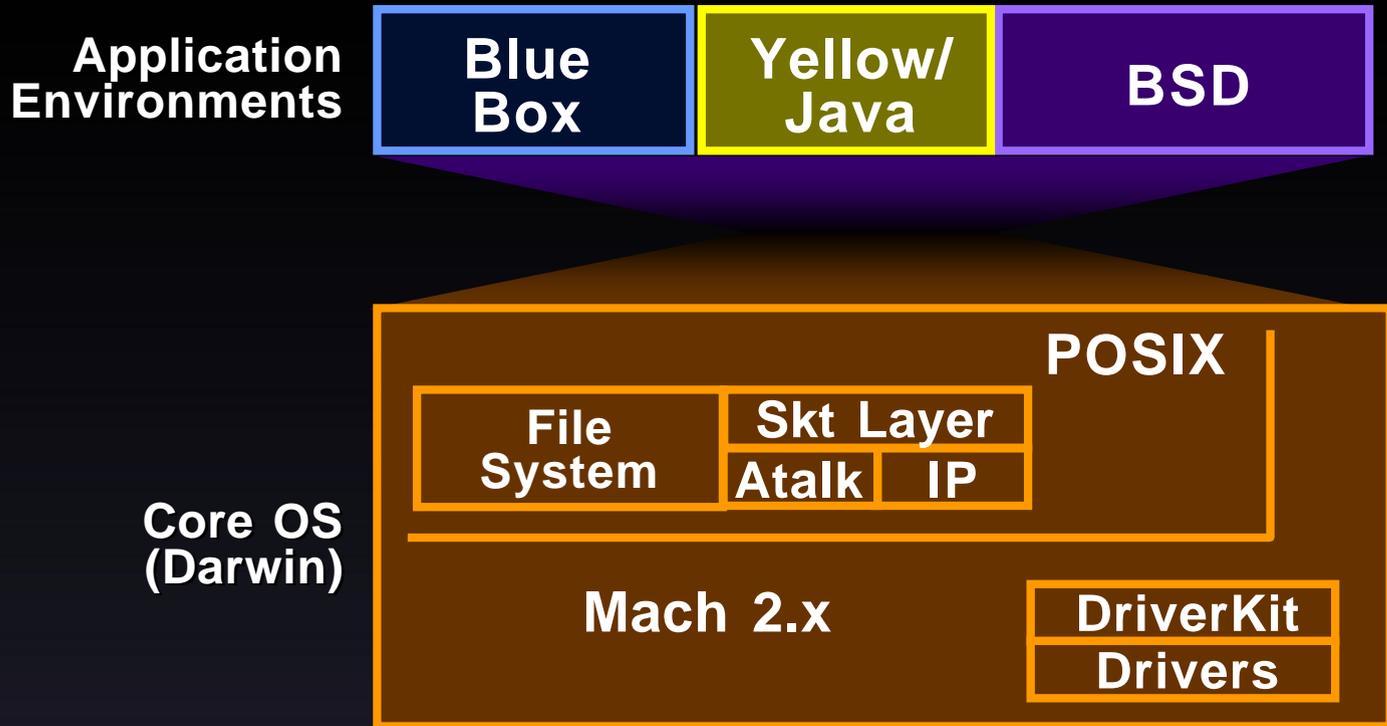
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# BSD Support in Mac OS X

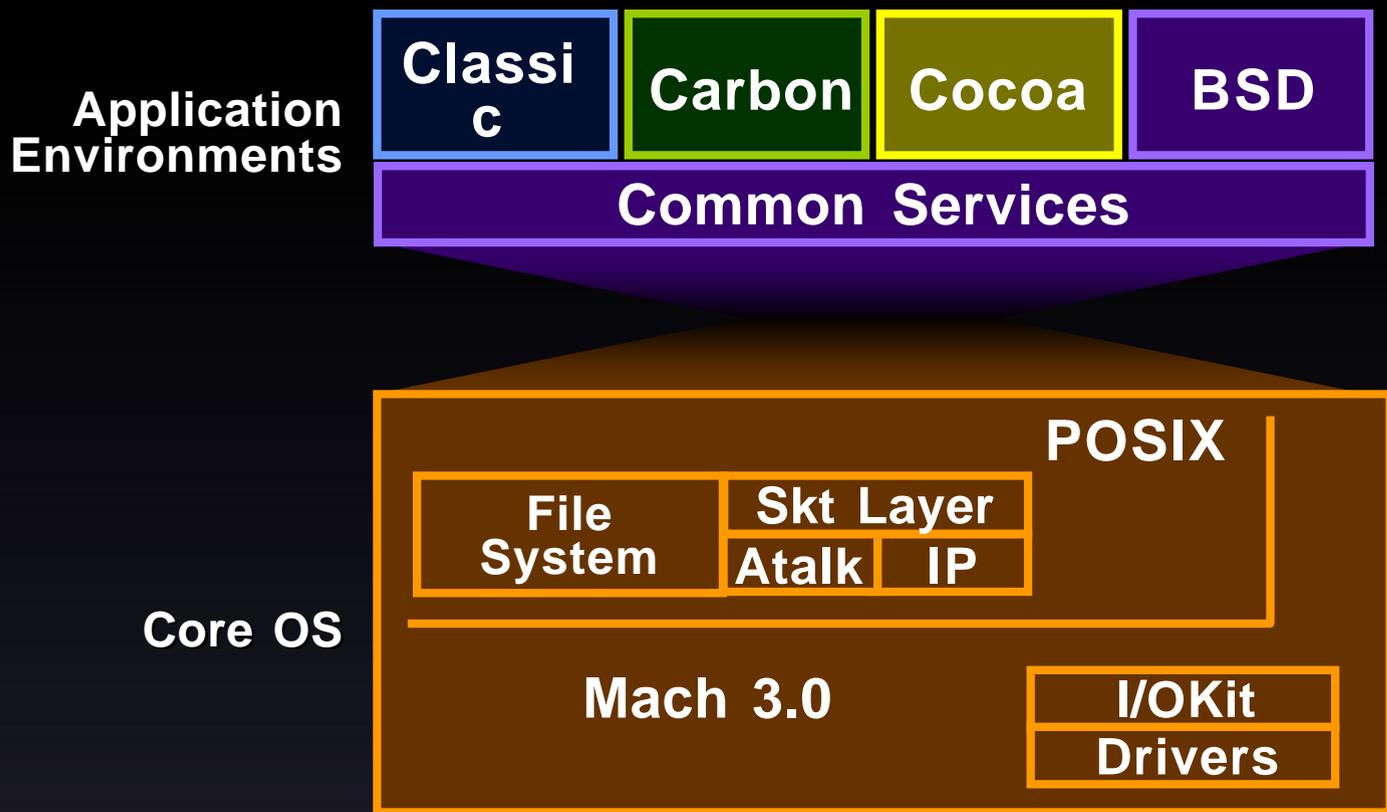
Brett Halle

Manager,  
Core OS Engineering

# Mac OS X Server



# Core OS and Mac OS X





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# BSD Support in Mac OS X

Wilfredo Sánchez

Resident Unix Weenie  
Core OS / BSD

# Topics

- What is BSD?
- BSD's role in Mac OS X
- Programming with BSD
- Mac OS X Server vs. Mac OS X

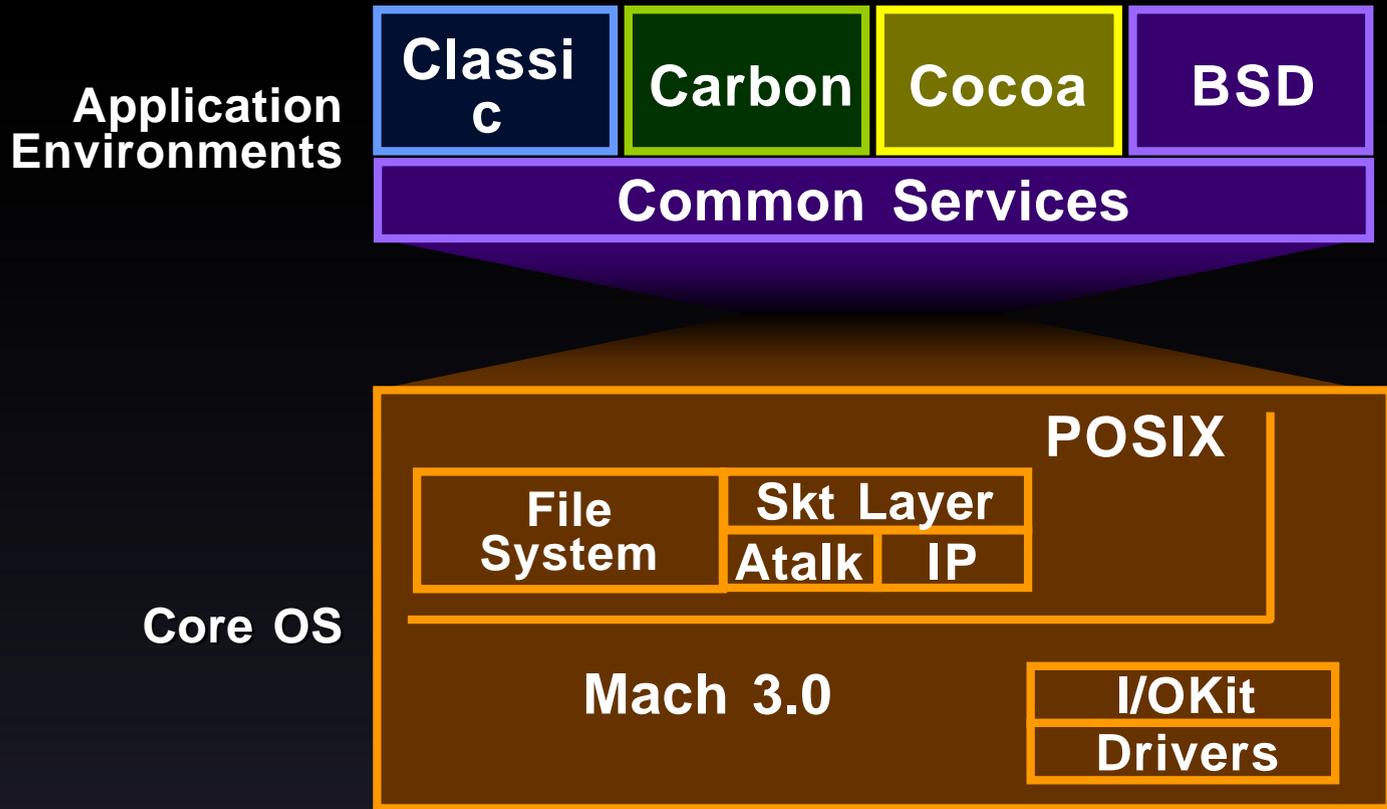


# What Is BSD?

- It's an Operating System!
- The BSD kernel
- The BSD libraries
- The BSD application environment



# The BSD Kernel

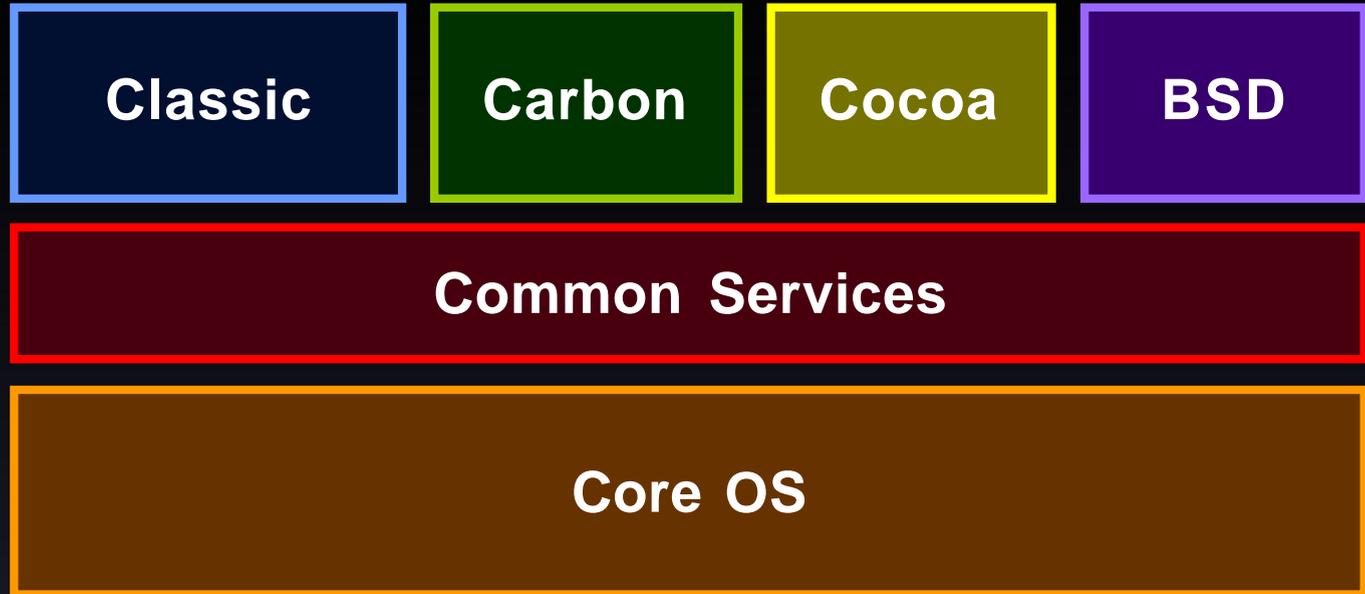


# The BSD Kernel

- File system layer
- Network stack
- POSIX Functionality
- Mach sits underneath
  - Tasks and threads
  - Memory
  - Device layer



# Commands and Services



# Commands and Tools

- Network tools
  - telnet, finger, ftp
- File Tools
  - cp, ls, mkdir, tar, rsync
- System tools
  - ps, kill, nice, shutdown



# System Services

- NetInfo
- NTP
- DNS/BIND
- mach\_init, init
- SystemStarter
- update
- syslog

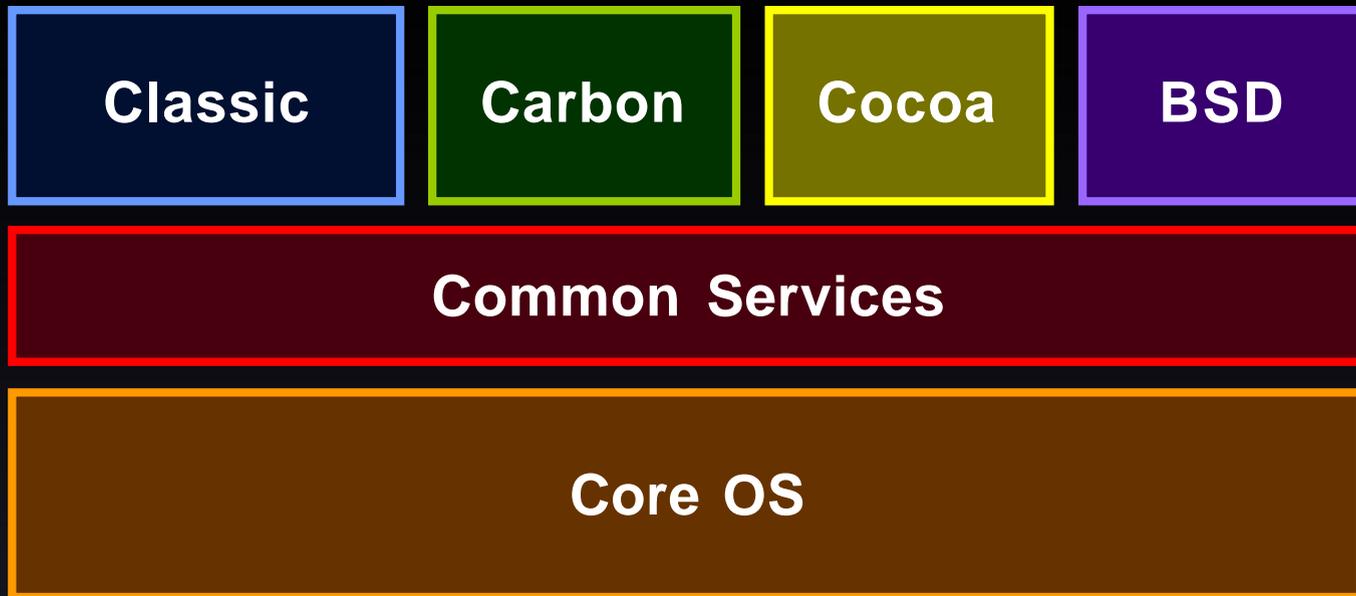


# POSIX Applications

- Apache
- Emacs
- Sendmail
- Perl, Tcl, Python
- Samba



# The BSD Libraries



# The BSD Libraries

- C Library
- Math Library
- POSIX/BSD System API
- POSIX threads (new!)
  - cthreads is gone
- Curses, util, telnet, kvm, etc.



# When Should I Use the BSD API?

- POSIX portability
- Porting from POSIX
- When Carbon and Cocoa don't go down far enough



# POSIX?

- Compliance is a goal
- Certification is **not** a goal
- The BSD API is a first-class citizen in Mac OS X
- Can co-exist with Carbon, Cocoa, and Java



# Porting from POSIX to Mac OS X

- No X Windows support
  - Cocoa is usually best choice
  - Carbon, too
- Use `-fno-common`
- `dyld`, not `dlopen()`





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Demo

# Where Did We Get It?

- Inherited from OpenStep (BSD 4.3)
- NeXT Argon project brought up BSD 4.4Lite, completed with Rhapsody
- Now we use \*BSD
  - FreeBSD and NetBSD connection
- Darwin



# Server (vs. Client)

- BSD environment is present
- Apache and Internet services
- File sharing
- Different administration
- Tuning



# Getting More Information

- Darwin OS
- CAE Specification, X/Open 1997
- *Design and Implementation of the 4.4 BSD Operating System*, McKusick, et. al.
- [www.FreeBSD.org](http://www.FreeBSD.org)
- [www.NetBSD.org](http://www.NetBSD.org)



# Roadmap

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**Introduction to Open  
Source at Apple**

Tape

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**Core OS Overview**

Tape

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**Mac OS X Kernel**

Tape

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**Mac OS X BSD Support**

Room A1  
Thur., 10:15am



# Roadmap

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**I/O Drivers—Mac OS  
X**

I/O Kit

Room A1  
**Thur., 1:00pm**

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**Mac OS X Networking Overview**

Room A2  
**Fri., 9:00am**

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**Mac OS X File System**

Room A1  
**Fri., 2:30pm**

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**Intro to Cocoa  
(Yellow) Framework**

Room B  
**Fri., 9:00am**

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Q&A



Think different.<sup>TM</sup>



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