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Core OS Overview

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Mac OS X—Core OS

- Robust OS Foundation
  - Mac OS X Server
  - Mac OS X

- Based on proven technology
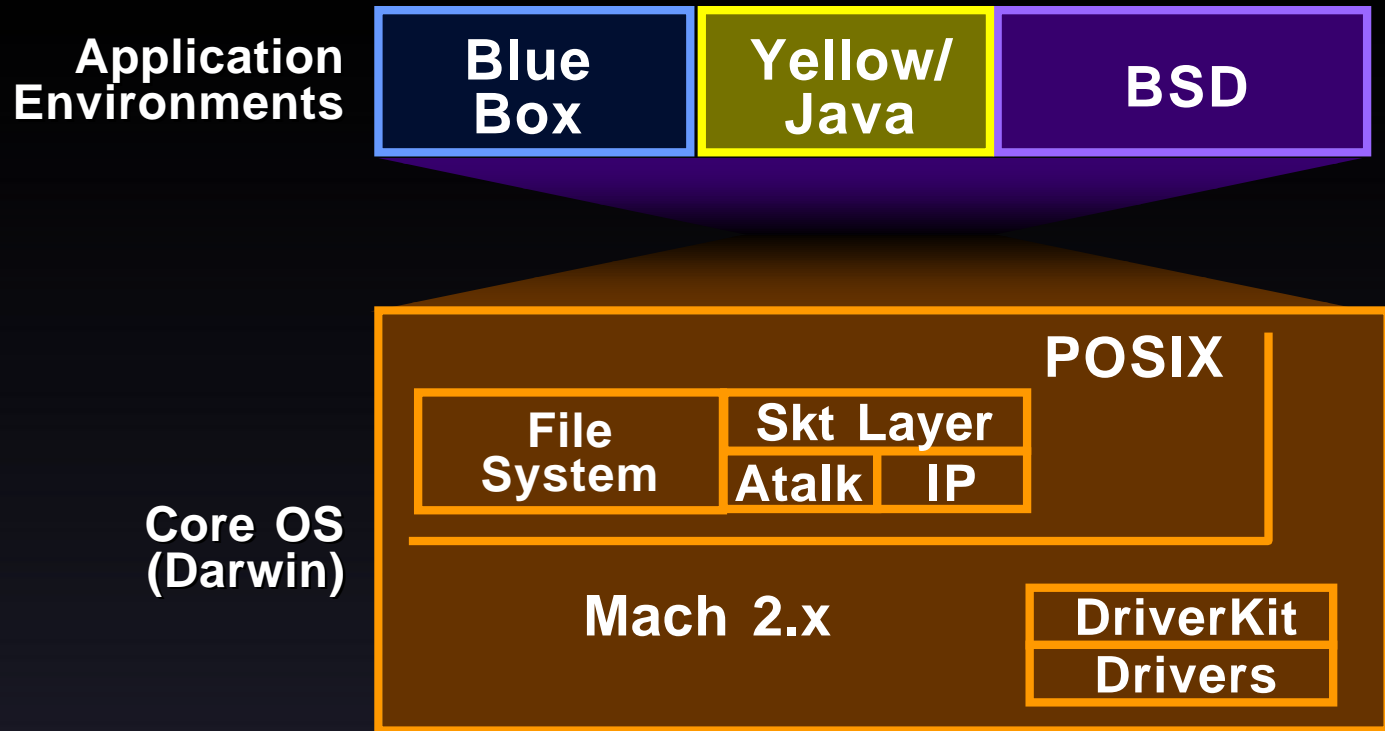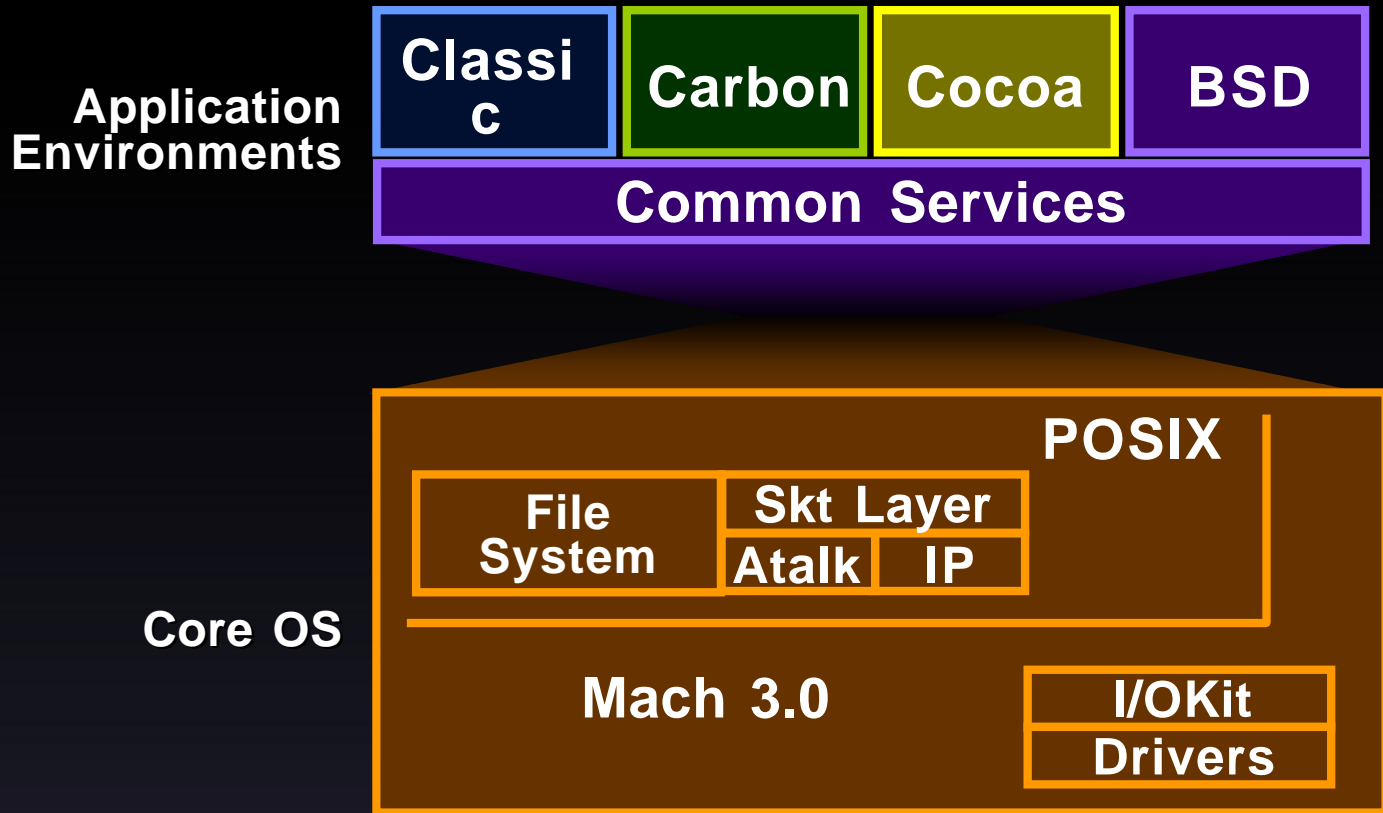
- Open Source: Darwin

Core OS

- Provides preemption and protection
- Supports application environments
- Processor independent
- High performance
- Flexible
- Scalable
- Fully buzz-word compliant

Mac OS X Server

Application Environments

| Blue Box | Yellow/Java | BSD |

Core OS (Darwin)

POSIX

File System

Skt Layer

Atalk | IP

Mach 2.x

DriverKit
Drivers

Core OS and Mac OS X

Application Environments

| Classic | Carbon | Cocoa | BSD |

Common Services

Core OS

POSIX

File System | Skt Layer | Atalk | IP

Mach 3.0 | I/OKit | Drivers

Core OS—Mach

Application Environments

Classic	Carbon	Cocoa	BSD

Common Services

Core OS

POSIX

File System	Skt Layer
	Atalk	IP

Mach 3.0

I/OKit

Drivers

Mach

- Manages processor resources
    - CPU
    - Memory
- Scheduling
- Memory protection
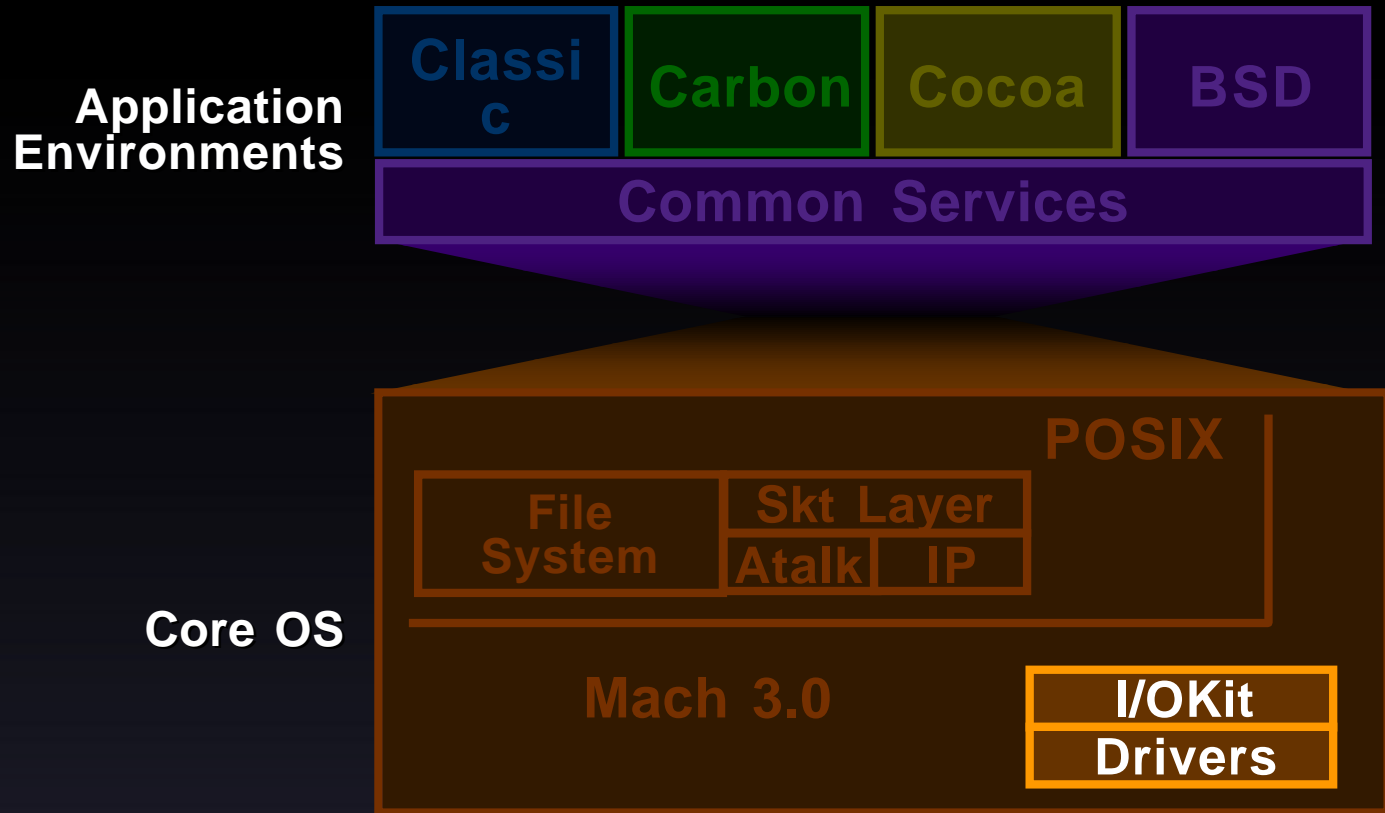- Messaging centered infrastructure

Mach

- Mac OS X Server: Mach 2.x
- Mac OS X: Mach 3.0+
  - Untyped IPC, RPC
  - Support for SMP / real-time
  - External pager
  - Modular architecture

Core OS—I/O Kit

Application Environments

| Classic | Carbon | Cocoa | BSD |

Common Services

Core OS

POSIX

| File System | Skt Layer |
| | Atalk | IP |

Mach 3.0

I/OKit

Drivers

I/O Kit

- Framework for easy device driver development
  - True plug-n-play
  - Dynamic device management
  - Power management
  - Modular and extensible
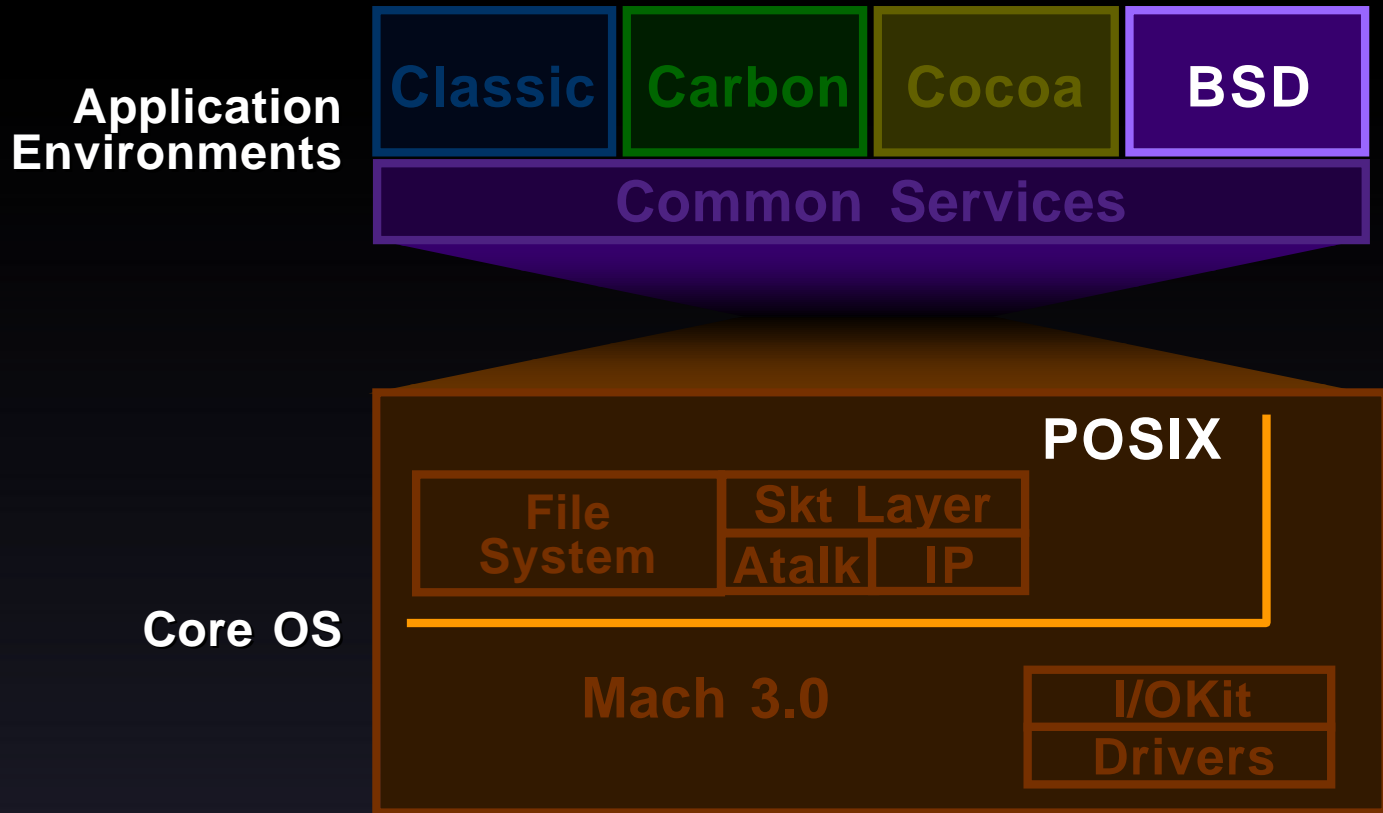- Supports many classes of devices

I/O Kit

- Mac OS X Server: Driver Kit
  - Objective-C

- Mac OS X: I/O Kit
  - C++
  - Multiprocessor capable
  - Fully dynamic (including hot swap)
  - DDK at Developer Preview 2

Core OS—POSIX / BSD

Application Environments

| Classic | Carbon | Cocoa | BSD |

Common Services

Core OS

POSIX

File System | **Skt Layer** / **Atalk** | **IP**

Mach 3.0 | **I/OKit** / **Drivers**

POSIX / BSD

- Based on BSD 4.4

- Provides "OS Personality" APIs and Services

  - File system

  - Networking

  - Basic security policy
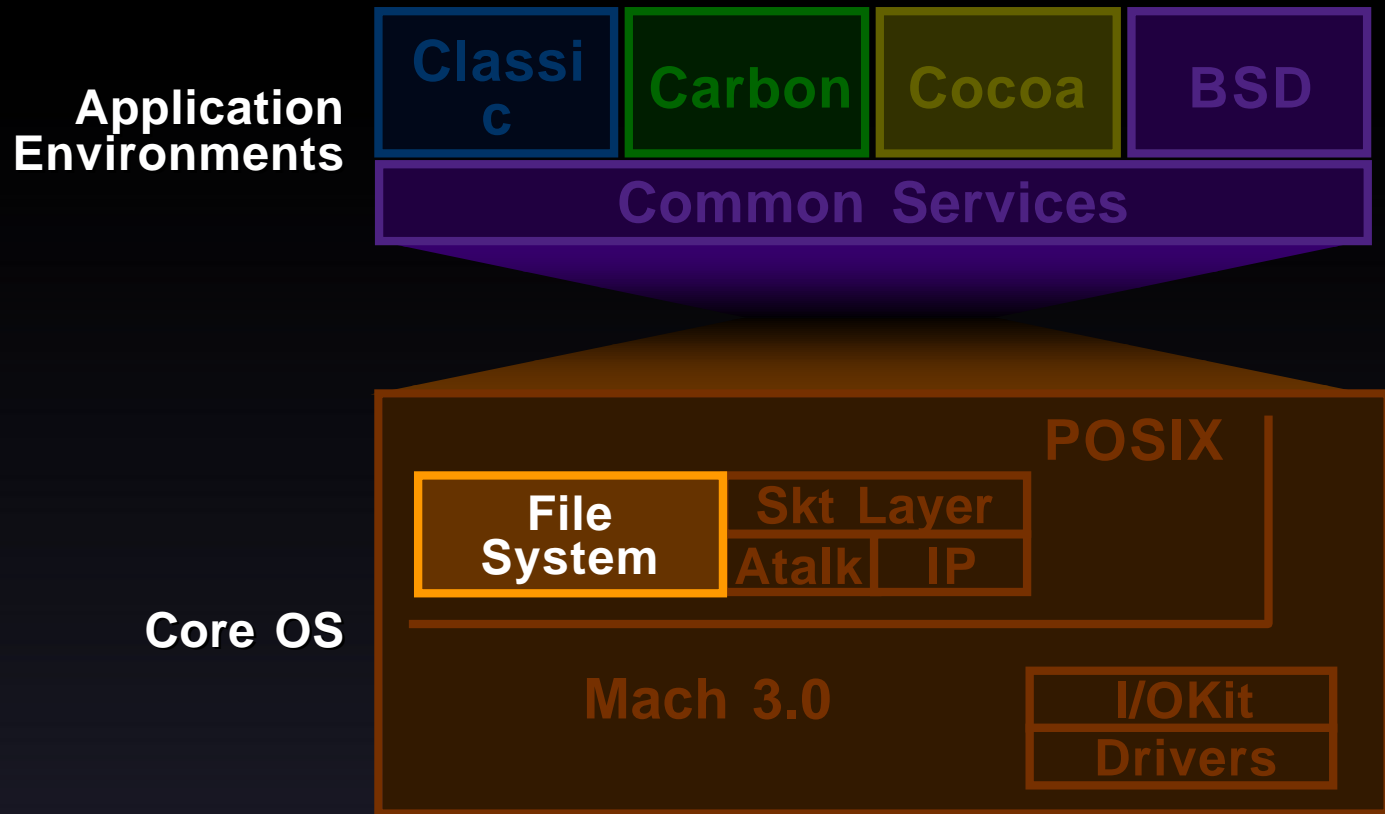
  - System Framework

  - Process model

POSIX / BSD

- Mac OS X Server: BSD 4.4
  - Supports server facilities (Apache, etc.)

- Mac OS X: Sync w/FreeBSD 3
  - Kernel API's available

  - Pthreads

  - Do not assume full BSD application environment (e.g., shell, command line)

Core OS—File Systems

File Systems

- Enhanced VFS design
  - POSIX++ interface
  - Layered architecture (stackable)
- Can support numerous file system types
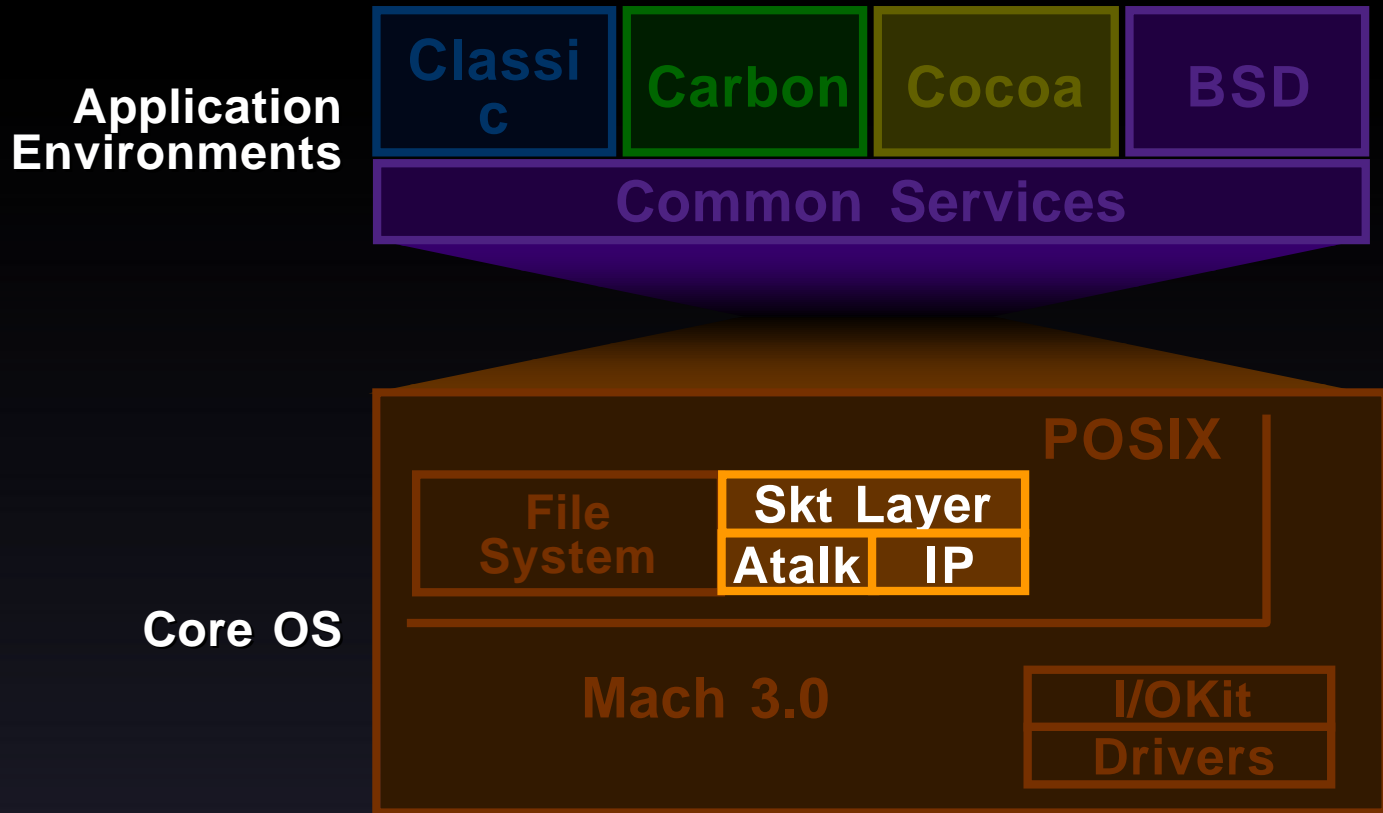 - UFS, ISO 9660, NFS, etc.

File Systems

- Mac OS X Server
  - UFS, NFS, ISO 9660, HFS+
  - UTF-8
- Mac OS X: Sync w/FreeBSD 3
  - Boot and root HFS+
  - UDF
  - Performance!

Core OS—Networking

Application Environments

Classic	Carbon	Cocoa	BSD

Common Services

Core OS

POSIX

File System

Skt Layer

Atalk | IP

Mach 3.0

I/OKit

Drivers

Networking

- BSD 4.4 TCP/IP Stack
    - Socket APIs

- Mac OS X Server
    - IP and AppleTalk
    - Multi-homing, routing, multicast
    - Server tuning
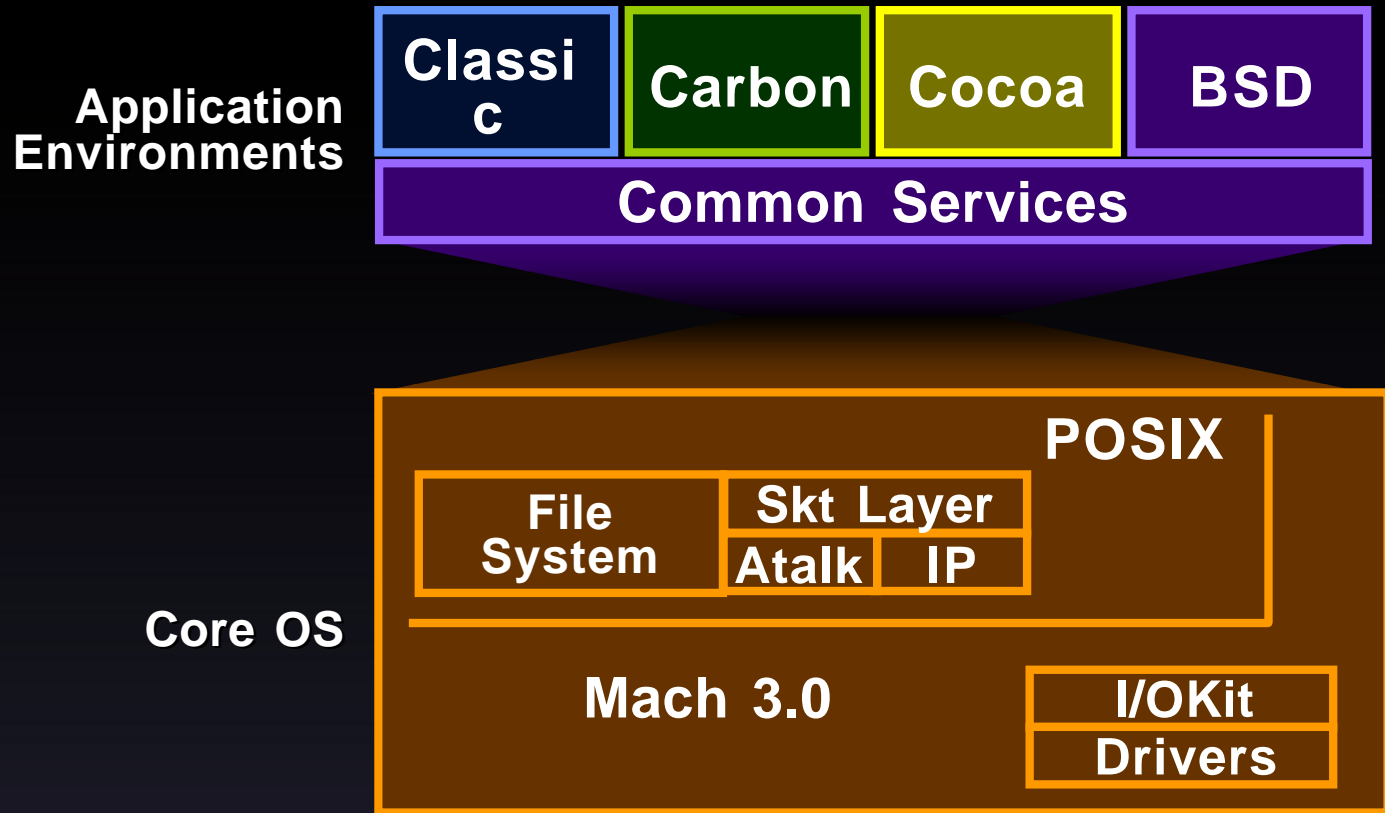   - Apache, AFP, Streaming Server

Networking

- Mac OS X
  - Sync w/FreeBSD 3
    - Modern IP features (NAT, Firewalls)
  - Socket-based AppleTalk
  - Kernel Extensions for Networking
  - Classic (Blue Box) support
  - Open Transport in Carbon

Core OS and Mac OS X

Application Environments

Classic	Carbon	Cocoa	BSD

Common Services

Core OS

POSIX

File System

Skt Layer

Atalk | IP

Mach 3.0

I/OKit

Drivers

Core OS and Mac OS X

- Upgrade to Mach 3.0
  - Enabling SMP
  - Better real-time support
  - Performance improvements

- More modular infrastructure

- I/O Kit DDK

- Kernel Extension SDK

Core OS and Mac OS X

- HFS and HFS+ support
    - HFS+ as a primary file system

- BSD "UNIX" user experience hidden
    - Optional environment for power users and developers

- Performance is a priority

- Open Source: Darwin

Programming the Core OS

- Mach
- I/O Kit
- POSIX / BSD
- File Systems

- Networking
- Darwin
- Application Environments

Roadmap

Darwin OS—Developing With Darwin	Tape
Mac OS X Kernel	Room A1 **Wed., 9:00am**
Mac OS X BSD Support	Room A1 **Thur., 10:15am**
I/O Kit	Room A1 **Thur., 1:00pm**

Roadmap

Mac OS X N & C	Room A2	**Fri., 9:00am**
Mac OS X File System	Room A1	**Fri., 2:30pm**
Core OS Feedback Forum	Room B	**Fri., 4:00pm**

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