Welcome

To Advance through Presentation
Use Page Up and Page Down Keys

Carbon Overview

Scott Forstall

Senior Manager,
Application Frameworks

Last Year: Direction

This Year: Details

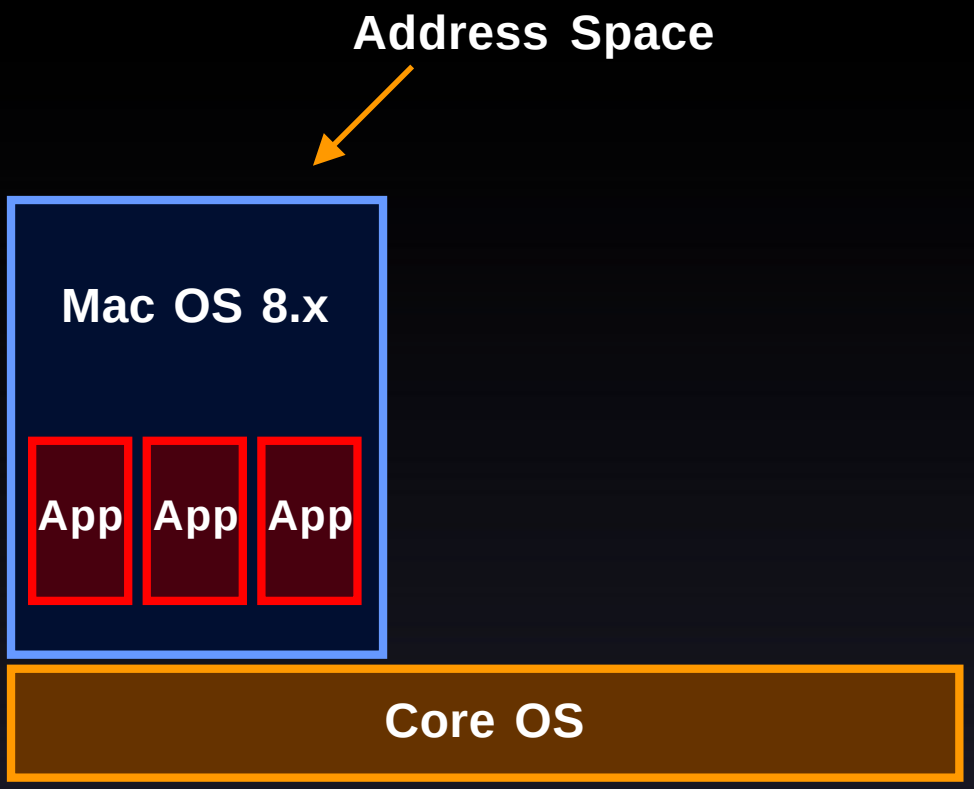
What the Quiz Will Cover

- What is Carbon?
- How did we get here?
- What APIs are available in Carbon?
- How do I create a Carbon app?
- What does a Carbon app look like?

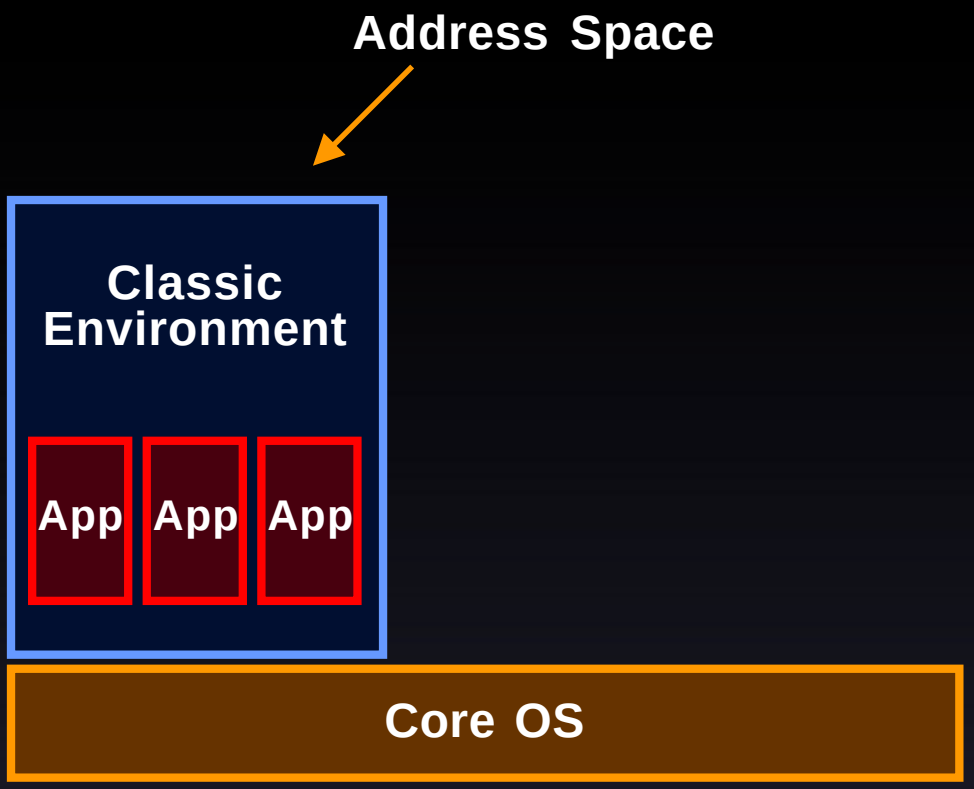
Carbon Goooooooals

- Preemptive multitasking
- Protected memory

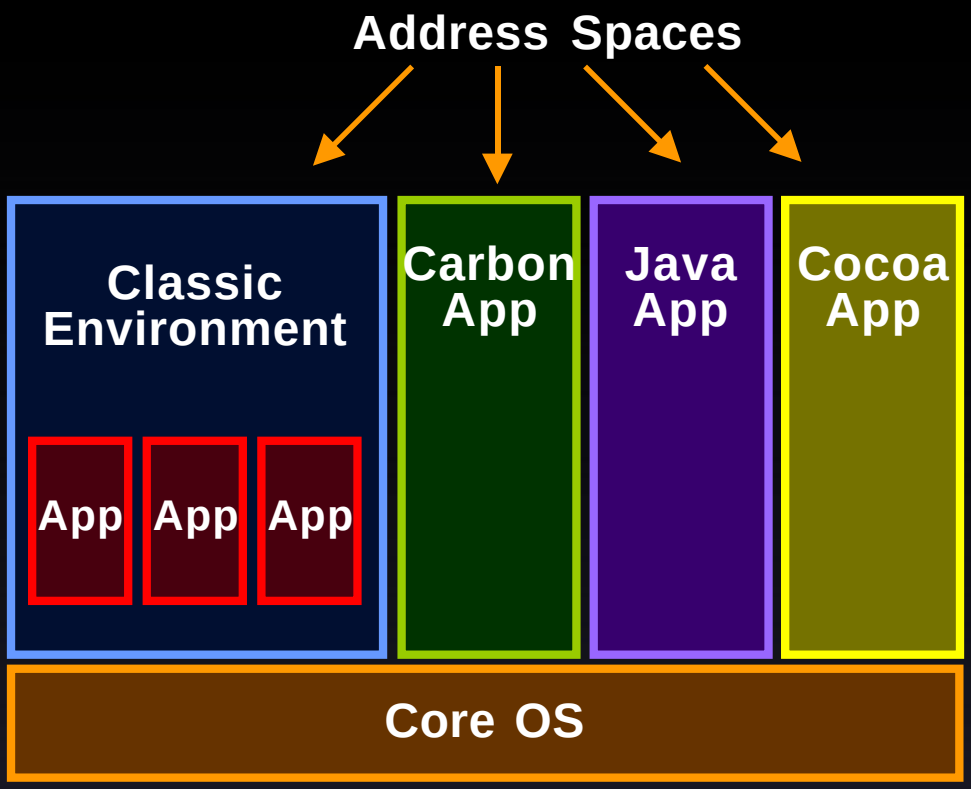
Protected Memory



Protected Memory

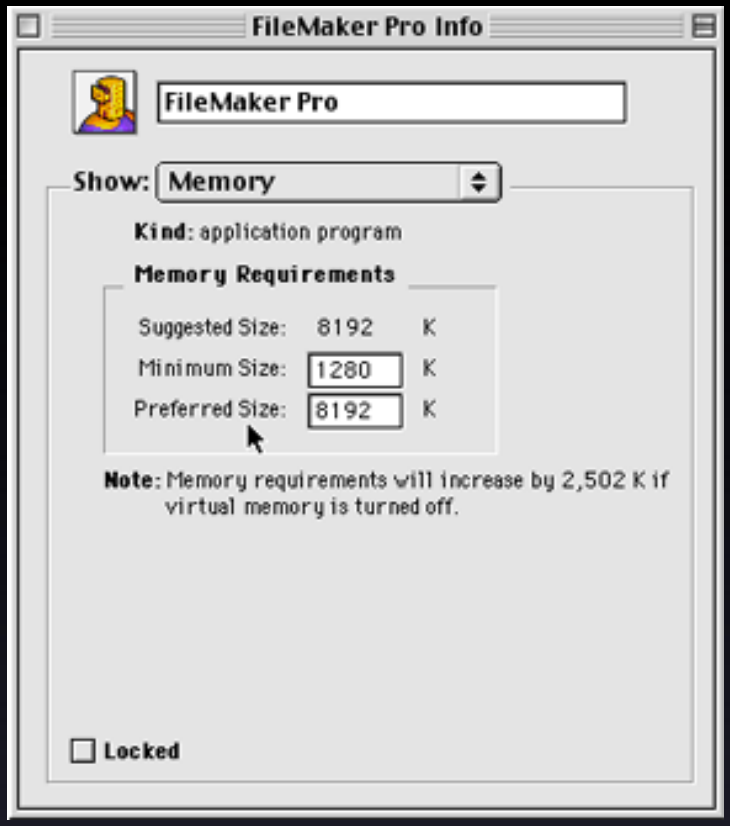


Protected Memory

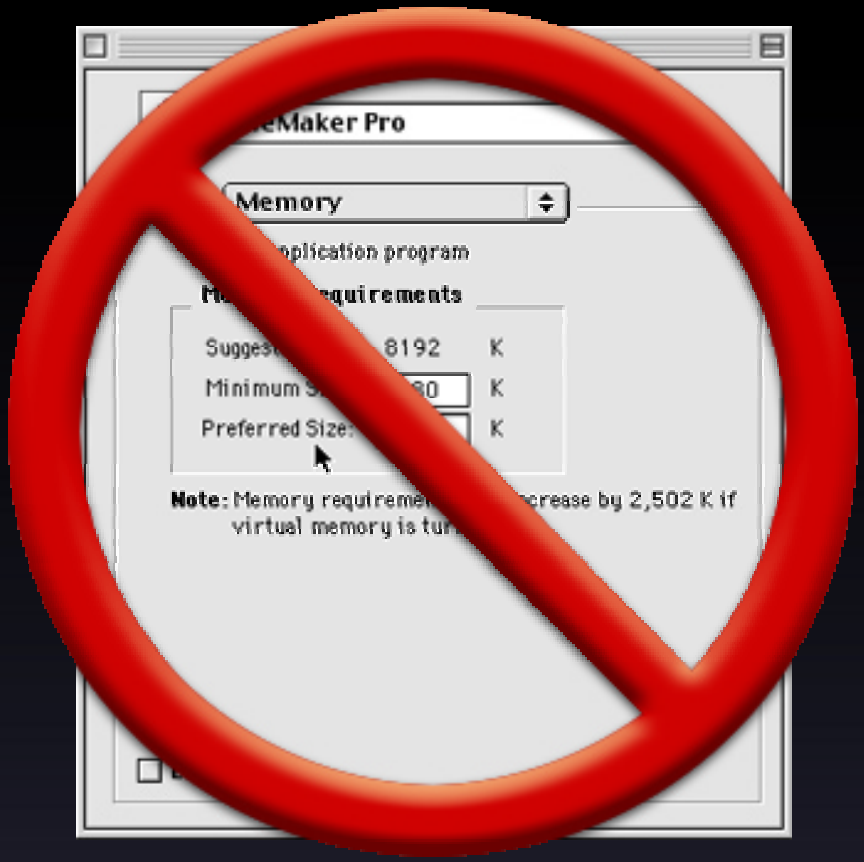


Carbon Goals

- Preemptive multitasking
- Protected memory
- No fixed-size heaps (VM always on)


FileMaker Pro Info
FileMaker Pro
Show:
Memory
Kind: application program
Memory Requirements
Suggested Size: 8192 K
Minimum Size: 1280 K
Preferred Size: 8192 K
Note: Memory requirements will increase by 2,502 K if virtual memory is turned off.
Locked

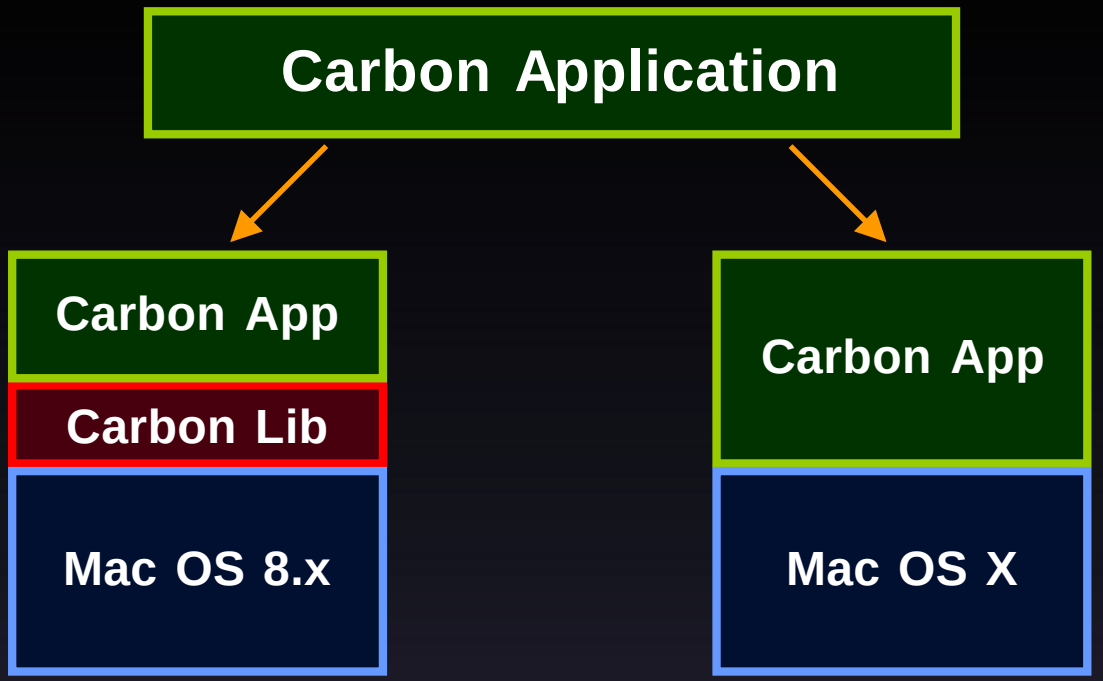
Bye-bye



Carbon Goals

- Preemptive multitasking
- Protected memory
- No fixed-size heaps (VM always on)
- Support applications running on
  - Mac OS 8
  - Mac OS X

Write Once, Run MacEverywhere



Other Benefits

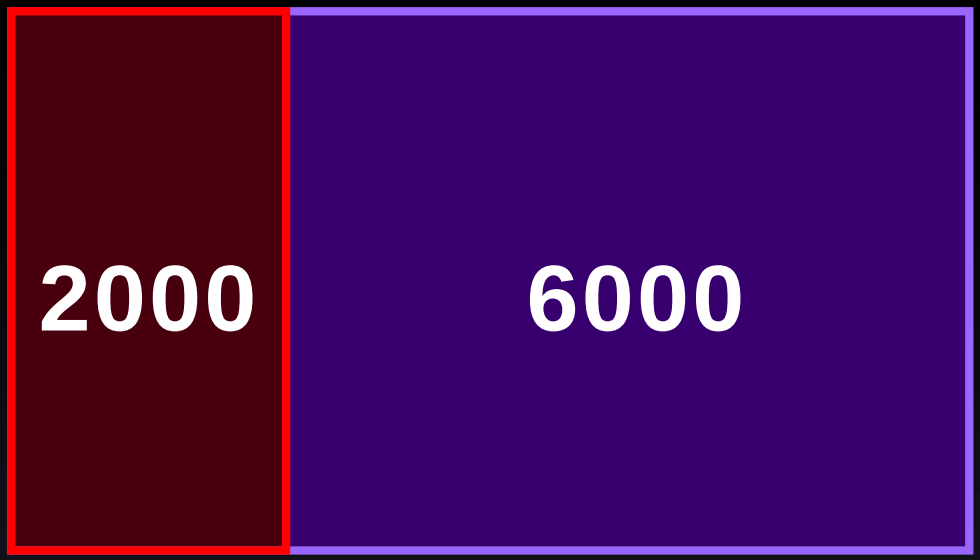
- Fast: all PowerPC native code
- A much needed tune-up and overhaul

Tune-up

8000 Functions

- 15 years of API development for Mac OS
- Many are essential
- Many prevent progress

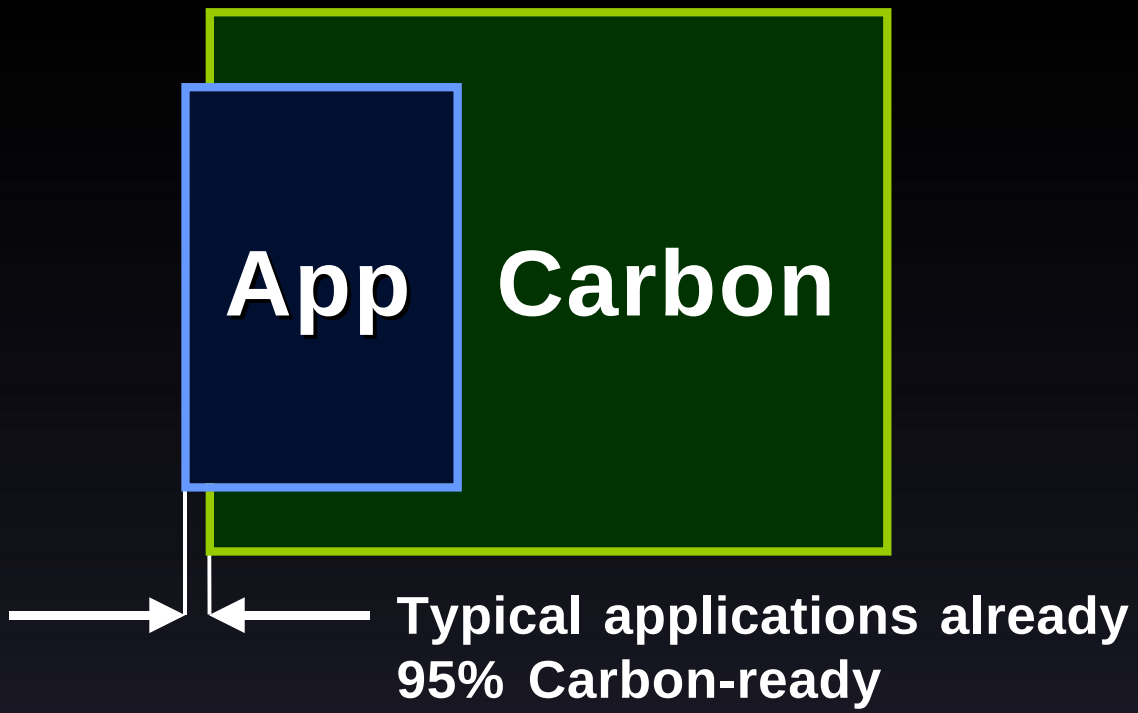
Tune-up



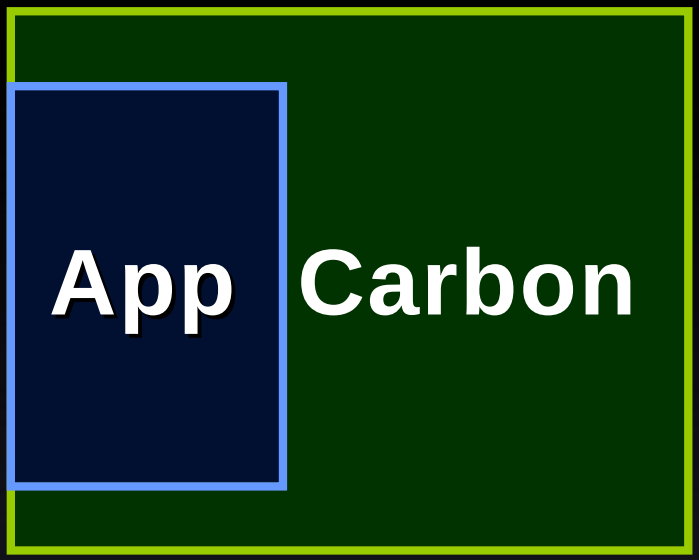
Tune-up

Carbon

Tune-up



Tune-up



What We Ain't

- A new application model
- Object-oriented, Java APIs
- Binary compatible with current apps
- English scholars

Tune-up

How did a nice API like you end up in a place like this?

API Selection Process

- No 680x0 specific APIs
  - Segment Manager
  - Package Manager
- No APIs that prevent protection
  - No low memory global data
  - Use accessors instead

API Selection Process

- Application APIs, not system control
  - AV Components (Monitors and Sound)
  - Control Strip Manager
  - Shutdown Manager
- Include new APIs to Mac OS 8
  - Limited obvious exceptions like hardware drivers

Feeling Trapped?

- Generic patching through Patch Manager unsupported
    - Works against stability goals
- Trap Manager is 68K-specific
- Provide many more specific hooks to modify behavior
- More extensible event system

Stop Touching Me

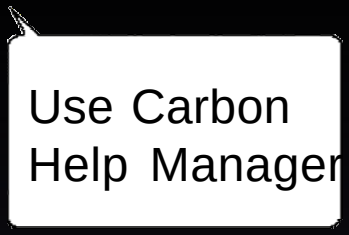
- Carbon evolution includes:
  - Advancing and improving features
  - Adding reentrant toolbox calls
- Many data structures are now opaque
- Accessors added

Going. . .Going. . .Gone

- Standard File
    - Use Navigation Services
- MFS File Manager functions
    - Working directories
- Edition Manager

Going. . . Going. . . Gone

- Balloon Help



- Apple Guide Manager
  - Use Apple Help instead

Graphics

- 2D
  - No QuickDraw GX
  - QuickDraw
  - ColorSync, FontSync, ATSUI supported
- 3D
  - No QuickDraw 3D
  - OpenGL supported

Would You Like To Play a Game?

- You asked for it…
  …you got it…

Game Sprockets!!!

Printing

- New printing architecture
- Similar application API for easy transition
- Print on Mac OS 8 with current printer drivers
- Print on Mac OS X with new printer drivers

QuickTime™

Of course!

Text and International

- Modern Dictionary Manager
  - Flexible, supports Japanese
- Additions
  - Multilingual Text Editor
  - Unicode Utilities
  - Font management APIs

Networking and Communication

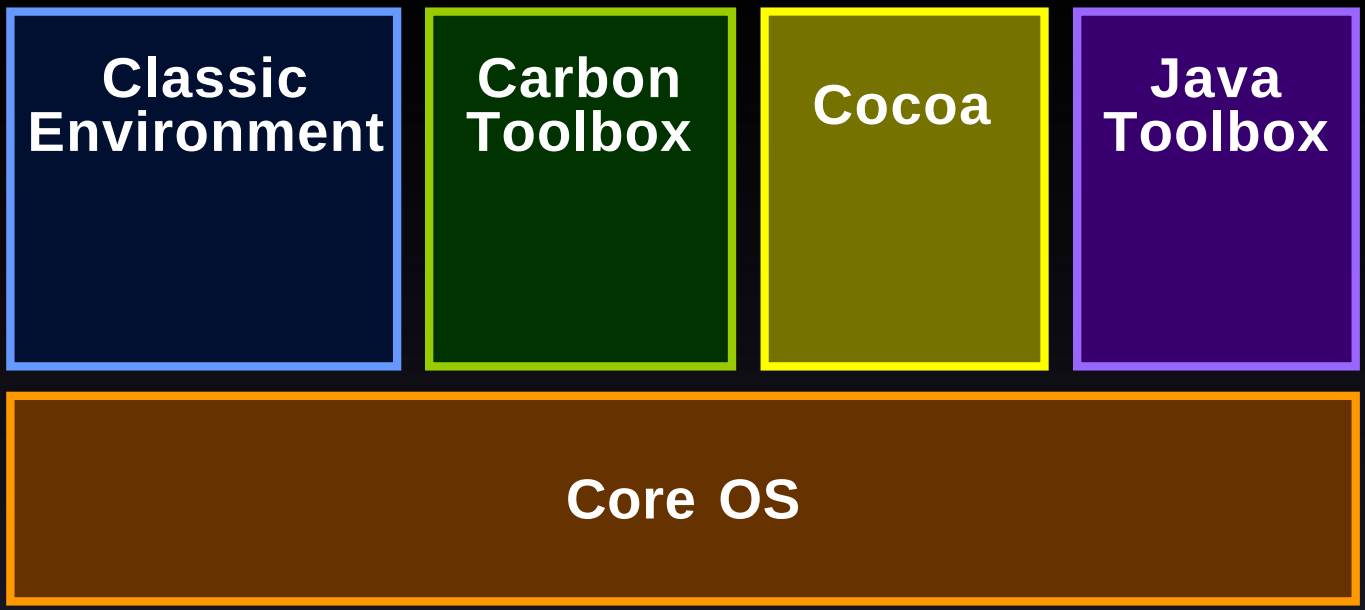
- AppleEvents
- Open Transport
  - Supplants Mac TCP
- AppleTalk is not part of Carbon
- AOCE and Telephone manager?

Hello? Goodbye.

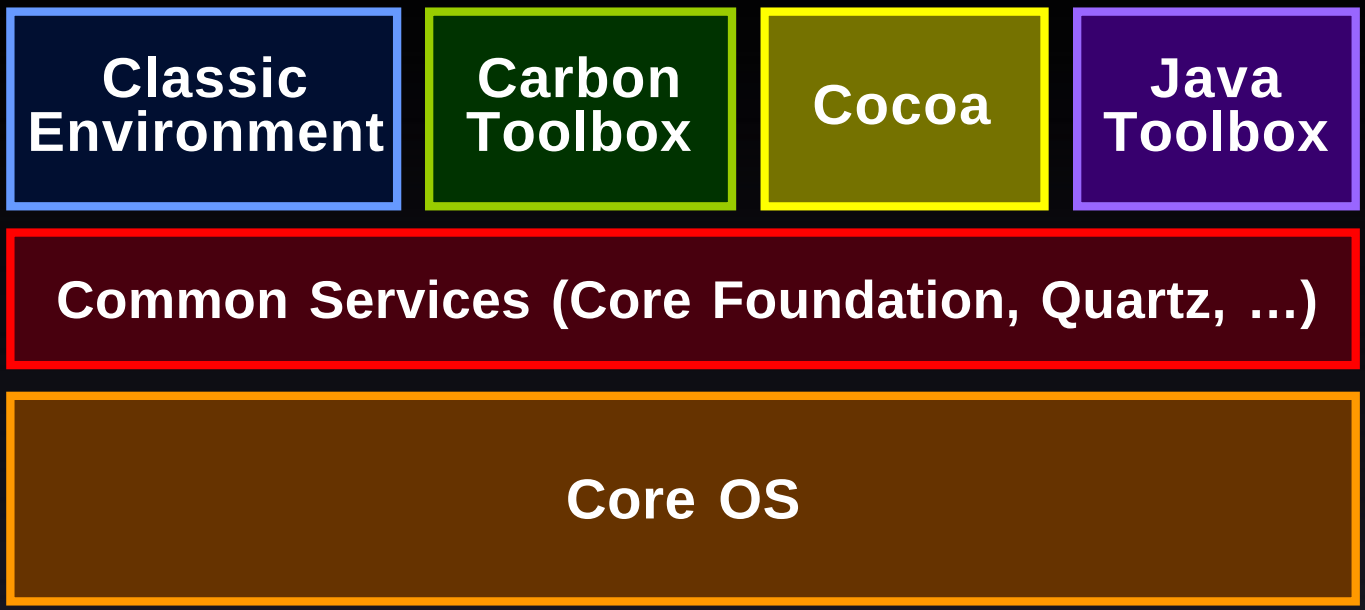
Hardware Interfaces

- Hardware access is OS specific
- SCSI Manager partially supported
- Other hardware devices
    - Write IOKit driver on Mac OS X
    - Use Device Manager on Mac OS 8

Mac OS X Architecture



Mac OS X Architecture



Core Foundation: The New Kid on the Block

- Unicode strings
- Collections
- Preferences
- XML parsing
- URLs
- Plug-in support

How Do I Get a Carbon Application?

- Step 1: Write or acquire a Mac OS application
- Step 2: Carbonize said application
- Step 3: There's no step 3! What would step 3 be?

I Want To Be Carbon!

- Carbon Dater
- Build for CarbonLib on 8

8 Is Nice, But I'm Gen-X

- Build for LiteCarbonLib on 8
- Run on Mac OS X
  - As CFM
  - Cross-compile as Mach-O
  - Compile for Mach-O natively on Mac OS X

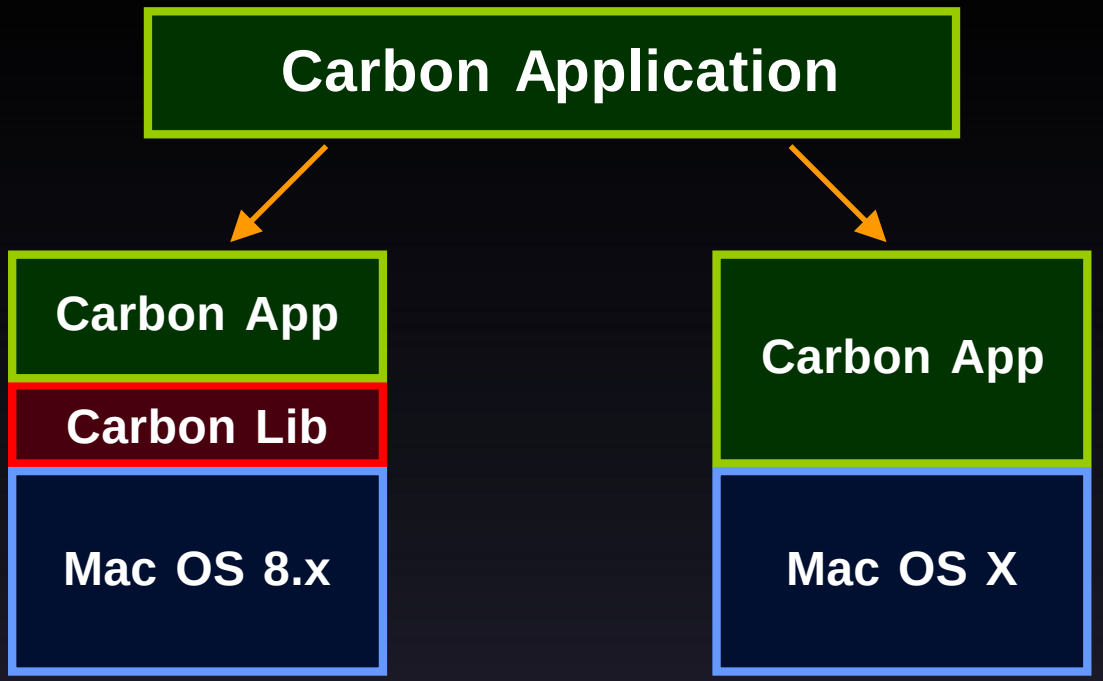
Demo
Carbon Dater

Ron Hayden

Senior Manager, Tech Pubs

What Does a Carbon App Look Like?

Write Once, Run MacEverywhere

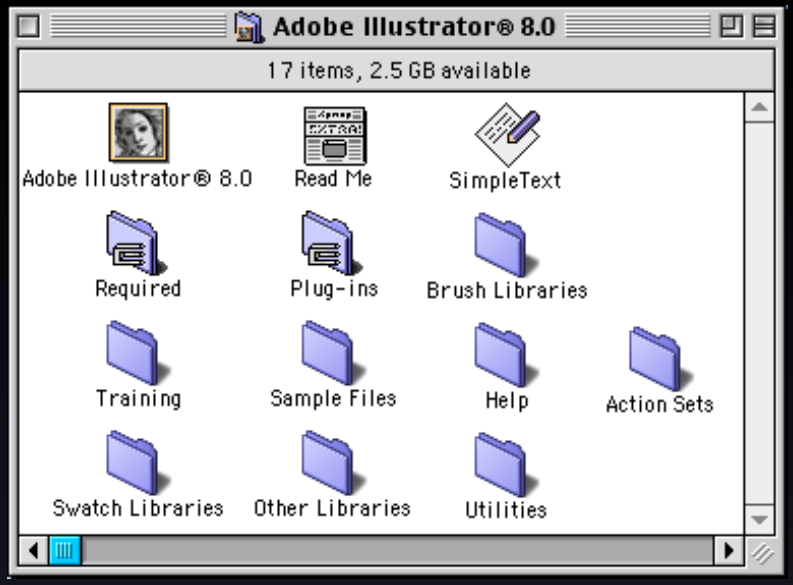


Localization Goals

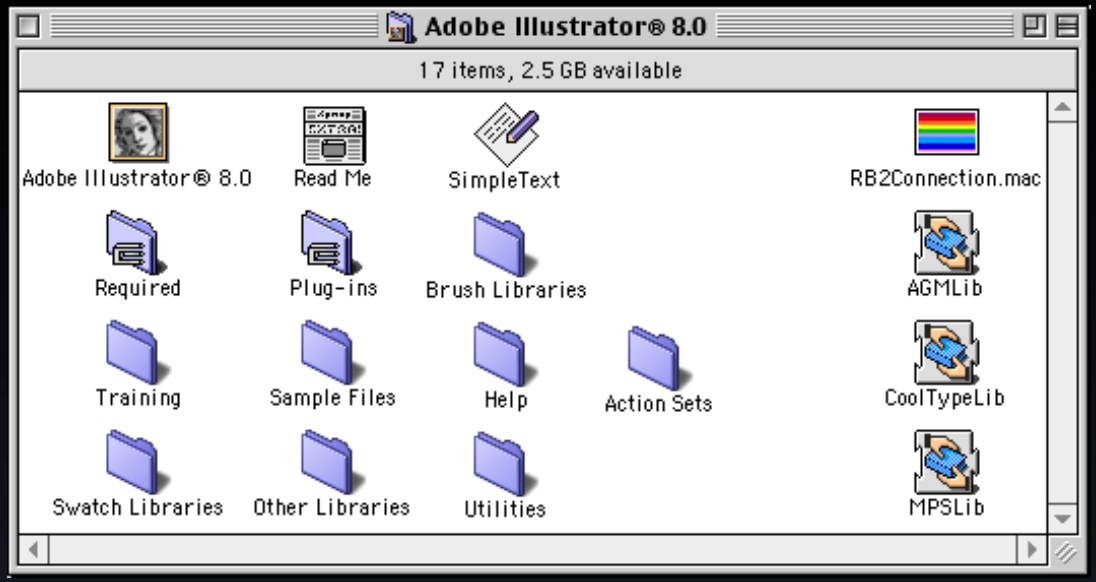
- Single Binary Multiple Languages (SBML)
- More languages can be added to an already packaged application

I Remember a Simpler Time . . .

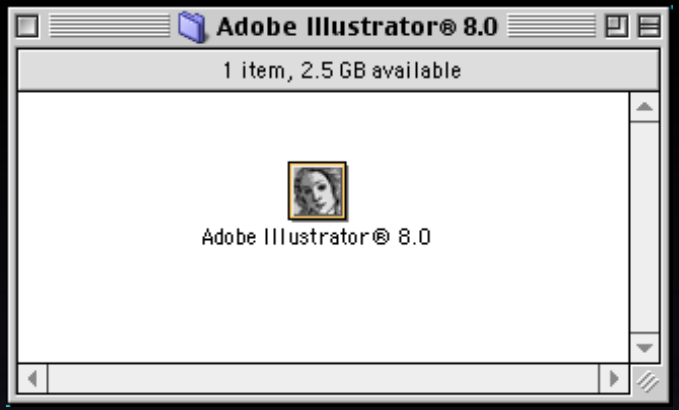
Where's Waldo?



Where's Waldo?



There You Are!

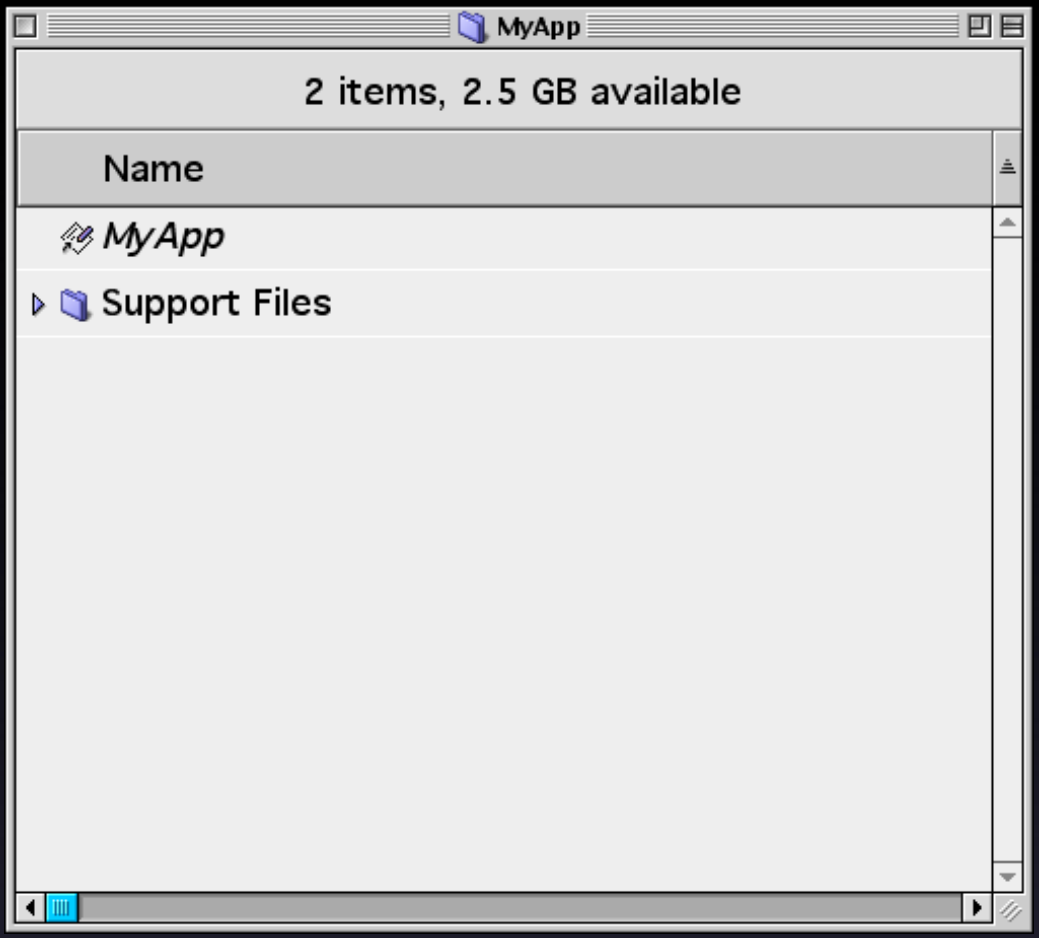


Application Packages

- Application represented by single Finder item
- Packaged as folder hierarchy
- A place to store supporting files and data

App Package Layout

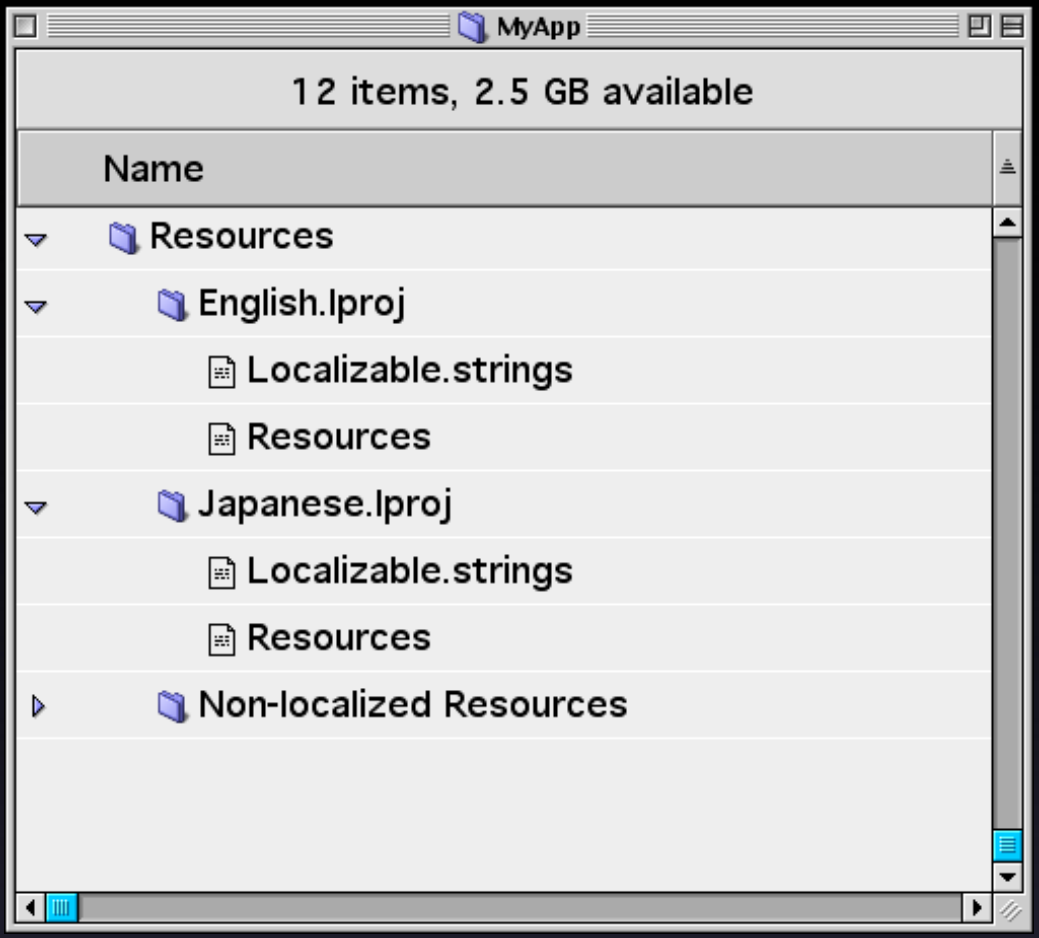
App Package Layout



App Package Layout

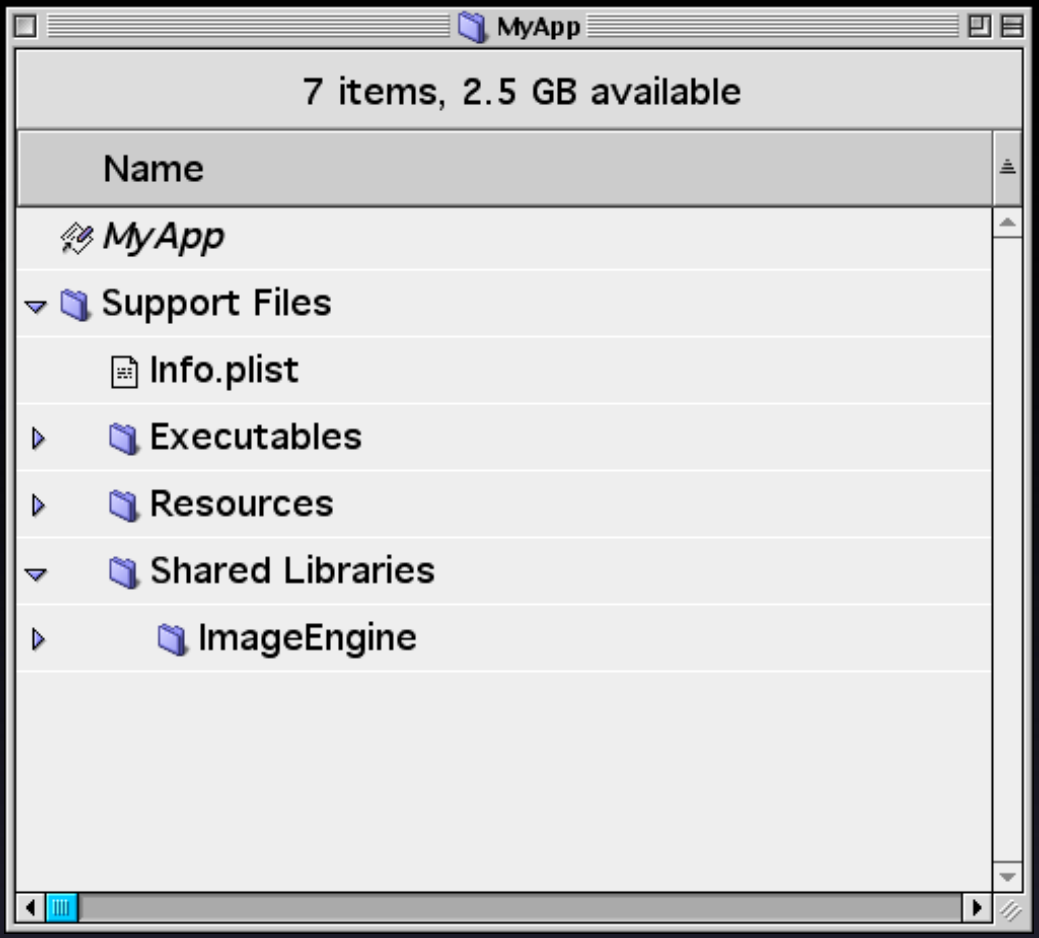
App Package Layout

App Package Layout



App Package Layout

App Package Layout



App Package Layout

Everyone Join In!

- Applications
- Shared libraries
- Plug-ins

Gimme Gimme Gimme

- May 98: Initial Carbon Spec
- Feb 99: Public SDK on Mac OS 8
- May 99: Mac OS X Developer Preview 1
- Fall 99: Sonata (CarbonLib built in)
- Fall 99: Mac OS X Developer Preview 2
- Early 2000: Mac OS X, CarbonLib

More Info

- www.apple.com/developer/macosx
- Carbon Porting Guide
- carbon@apple.com

Roadmap

Carbon on Mac OS 8 Porting to Carbon, Deploying on Mac OS 8	Hall C **Today 1:00pm**
Carbon on Mac OS X Building and running on Mac OS X	Hall C **Today 2:30pm**
HLTB: Carbon Changes and Additions	Hall 2 **Today 10:15am**
HLTB: The Carbon Event Model	Hall 2 **Today 1:00pm**

Roadmap

Open Transport in Carbon	Hall A2 **Today 10:15am**
Core Foundation: Plug-ins	Hall A1 **Today 4:00pm**

Roadmap

You Carbonize Your Application

Your Office
Mon., 10:00am

Take Home Points

- I have a really cute baby
- Carbon is more exciting than Star Wars
- Carbon: Just Do It

Think different.™

Welcome

To Advance through Presentation
Use Page Up and Page Down Keys