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# Java on Mac OS X (Server)

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# Java on Mac OS X (Server)

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# Java on Mac OS X (Server)

- Expect platform evolution
  - Features—JDK progression
  - Performance
- Exploit Mac OS X technologies



# Java on Mac OS X (Server)

Today



# Java on Mac OS X (Server)

Today, Now,



# Java on Mac OS X (Server)

Today, Now,  
Tomorrow,



# Java on Mac OS X (Server)

Today, Now,  
Tomorrow,  
and Some Millennium







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# Today

## Java on Mac OS X Server



# Mac OS X Server Kernel

- Mach
  - Pre-emptive multi-threading
  - Multitasking
  - Real Virtual Memory
- Free BSD
  - Sockets
  - Files
  - Pty's



# Java Starts with the VM

**JDK 1.1.6 VM**



# Java Starts with the VM

**JDK 1.1.6 VM + JITc**



# Unix Style SDK

- java
- javac
- javah
- javadoc
- javakey
- rmic
- jar
- jdb



# Add the AWT

**JDK 1.1.6 AWT**

**JDK 1.1.6 VM + JITc**



# Where Are the Apps?

**Applications, applets**

**JDK 1.1.6 AWT**

**JDK 1.1.6 VM + JITc**



We eat our own dog food!





# Here...

- Assistant (sets up accounts and network)
- TextEdit (with source!)
- PrintManager
- NetworkManager
- IconBuilder
- Sketch (with source!)
- Calculator



# Via Wrapped AppKit

**Applications,  
applets**

**Cocoa  
Applications**

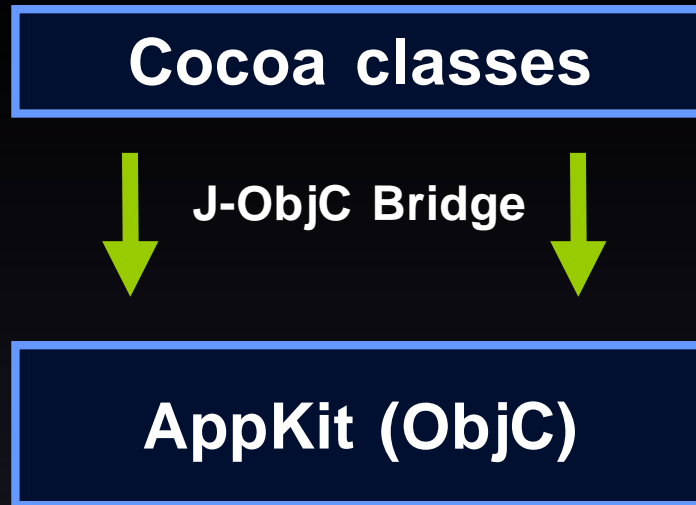
**AWT**

**AppKit**

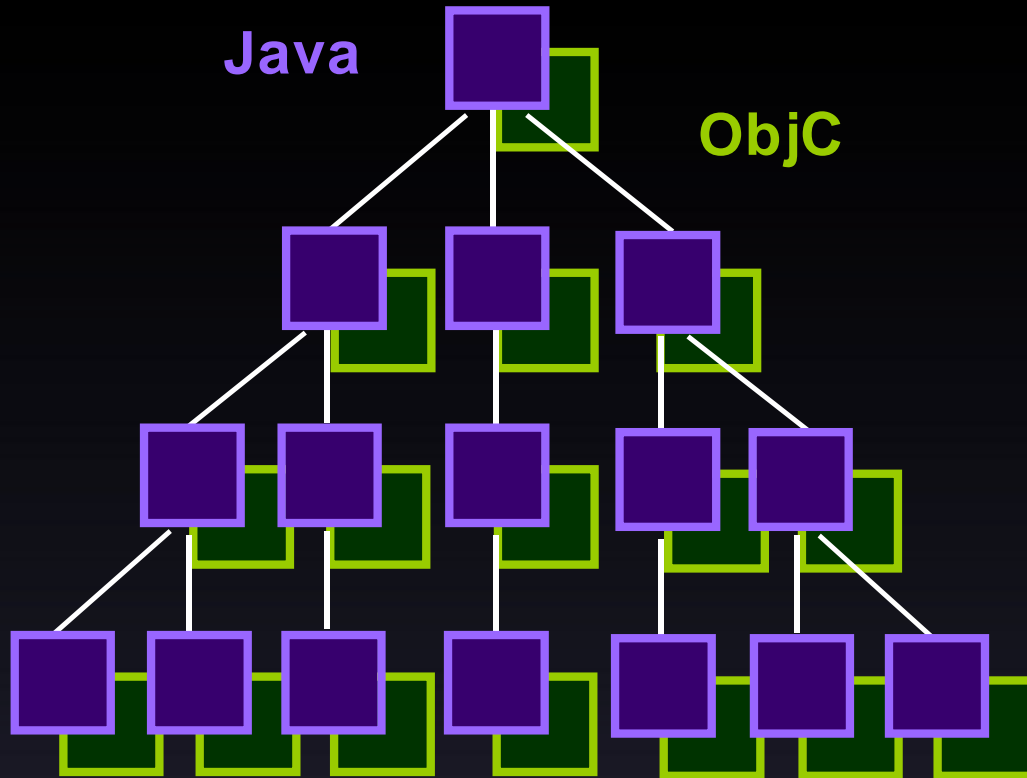
**JDK 1.1.6 VM + JITc**



# Using Java-ObjC Bridge



# Class Hierarchies



# Deep Similarities

- Single inheritance of implementation
- Multiple inheritance of interface
- Heap-based objects only
- Garbage collection (mostly)
- Exceptions
- Runtime meta-data (reflection)



# Some Differences

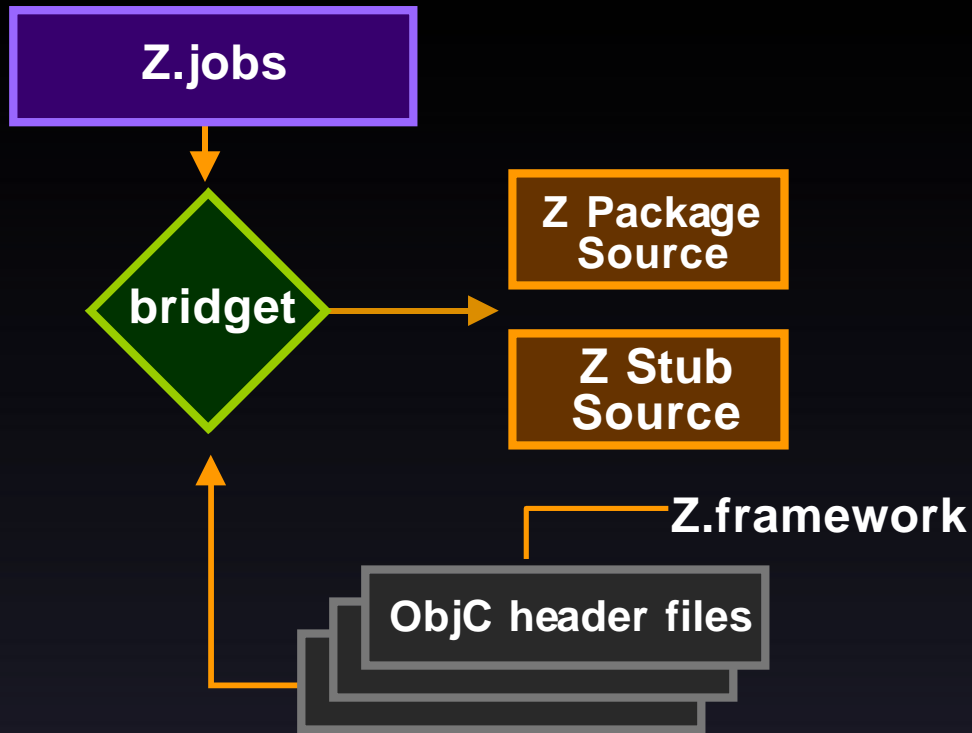
- Keyword labeled arguments
- Structures
- Flat class namespace
- Constructor inheritance



# The ObjC Framework “Z”

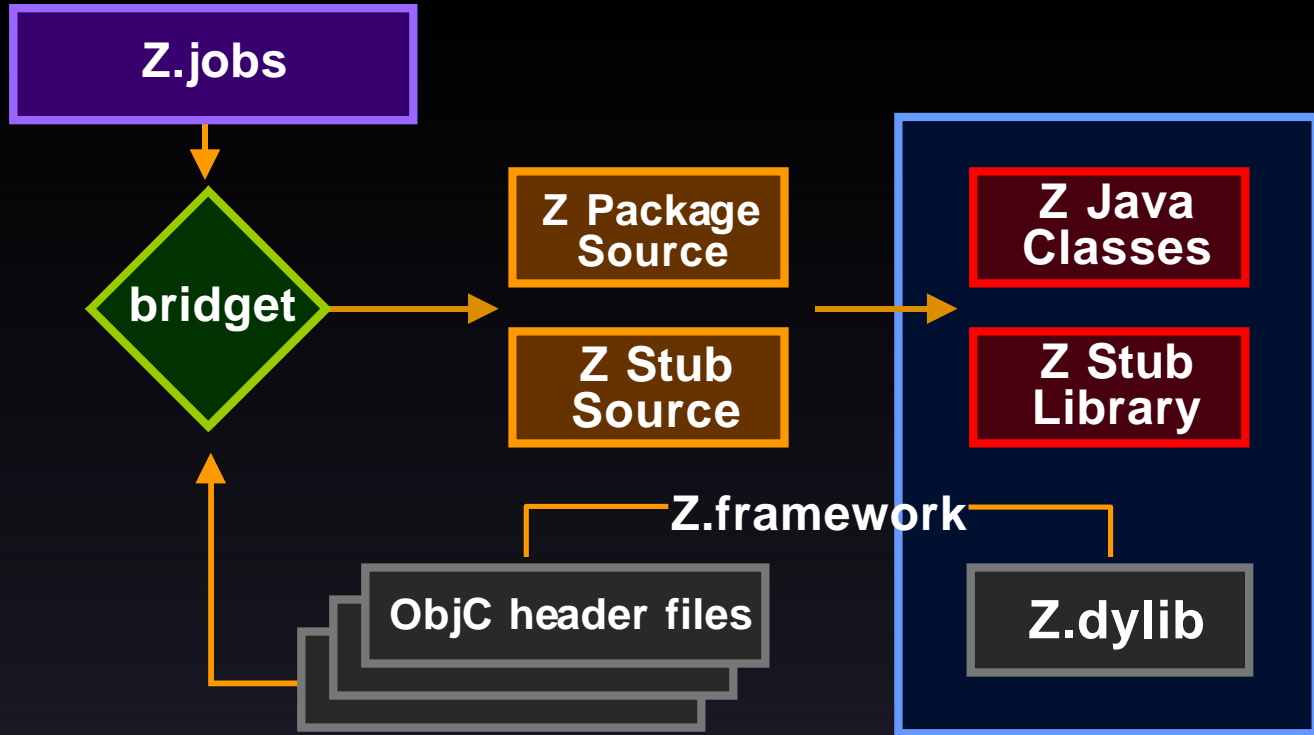


# Plus Specification File...





# Z Wrapped Framework!



# Wrapped Frameworks

- AppKit and Foundation
- WebObjects and Enterprise Objects
- Scripting
- NetInfo
- Printing

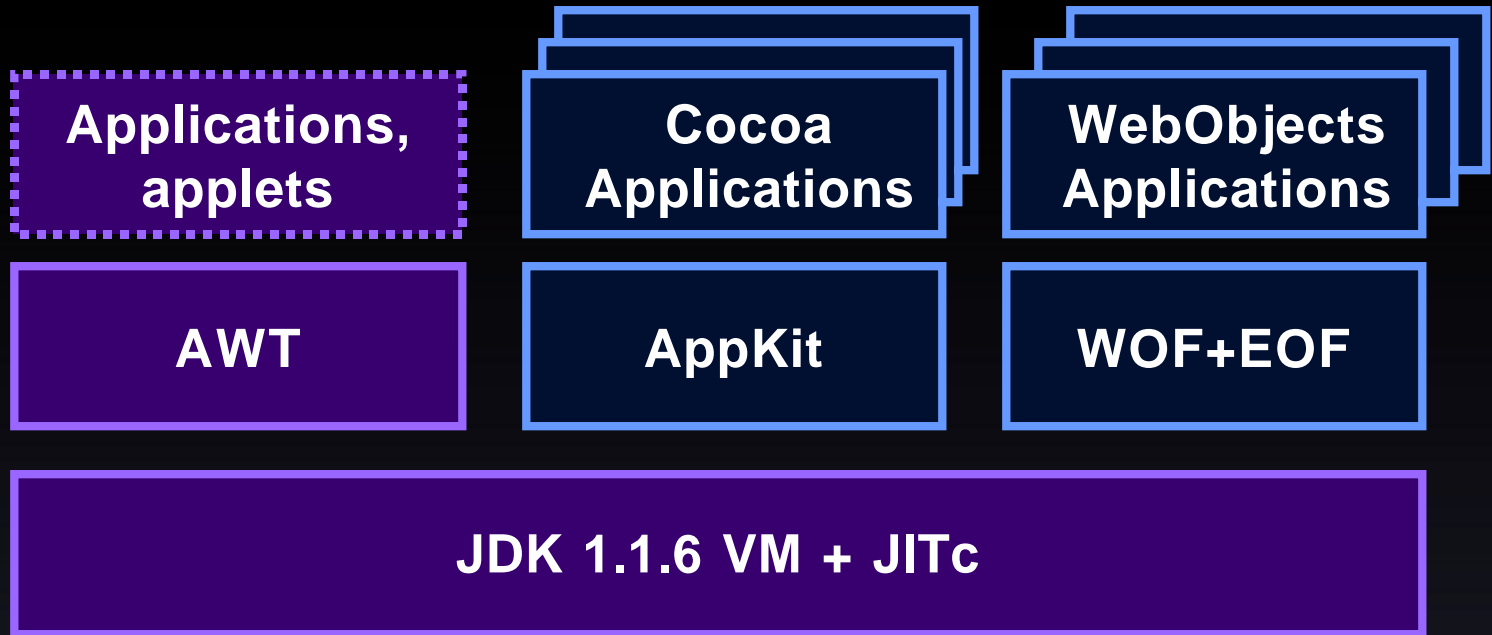


# Tools

- InterfaceBuilder
  - Builds GUI for Java subclasses of Cocoa
- ProjectBuilder IDE
  - Support for Packages and Wrappers
  - Java debugging
- JavaBrowser
- WrapIt



# Real Java Usage





# Now

Java on Mac OS X  
Developer Preview



# Everything but the AWT

**Applications,  
applets**

**Cocoa  
Applications**

**WebObjects  
Applications**

**AWT**

**AppKit**

**WOF+EOF**

**JDK 1.1.6 VM + JITc**





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# Demo

Ivan Posva

Java on Mac OS X  
Developer Preview



# Tomorrow

Java on Mac OS X  
Developer Preview 2





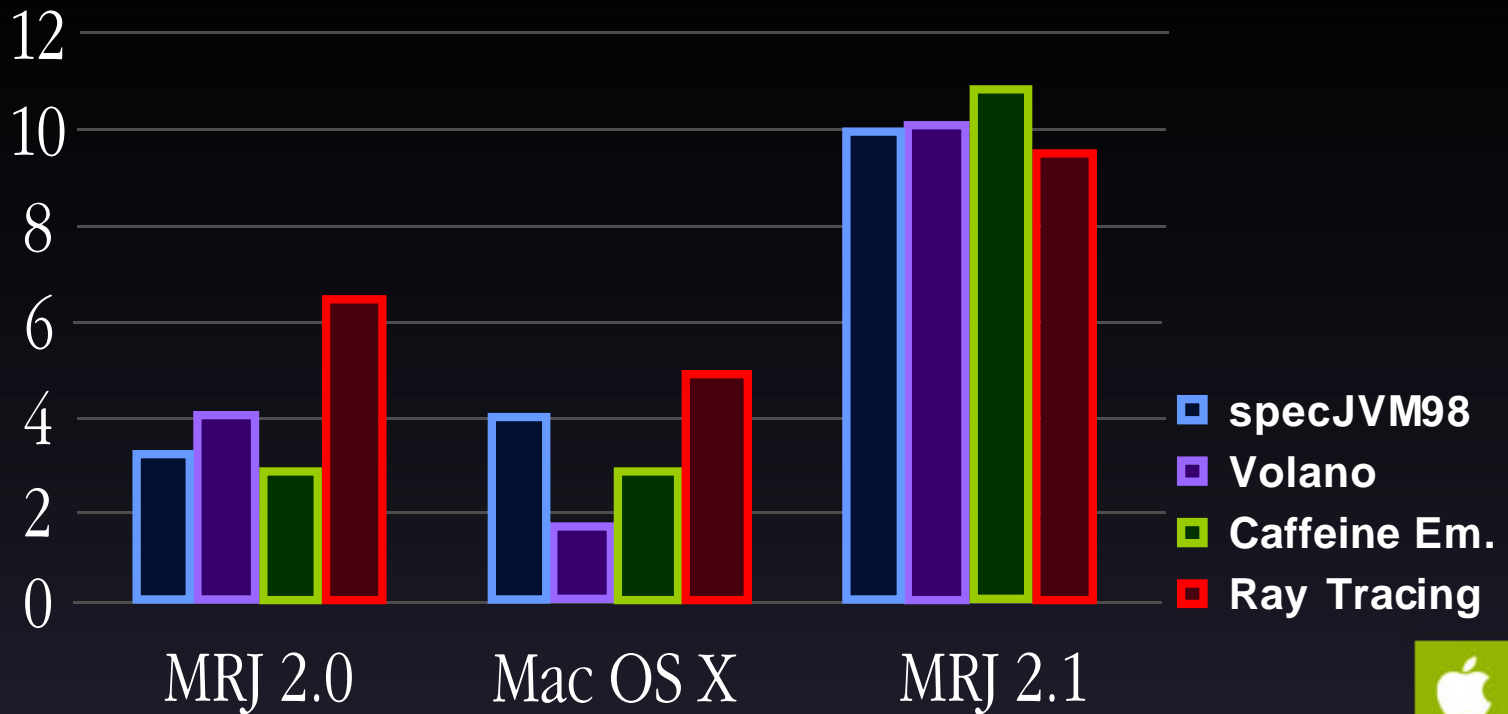
# Revise Runtime and JIT

**JDK 1.1.8 VM**

**SymJIT 3 JITc**



# Mac OS X JITC Performance



# Add AWT and Applets!

**Applications,  
applets**

**Cocoa  
Applications**

**WebObjects  
Applications**

**AWT**

**AppKit**

**WOF+EOF**

**JDK 1.1.8 VM**

**SymJIT 3 JITc**



# Today's AWT

**JDK 1.1.6  
AWT Classes**

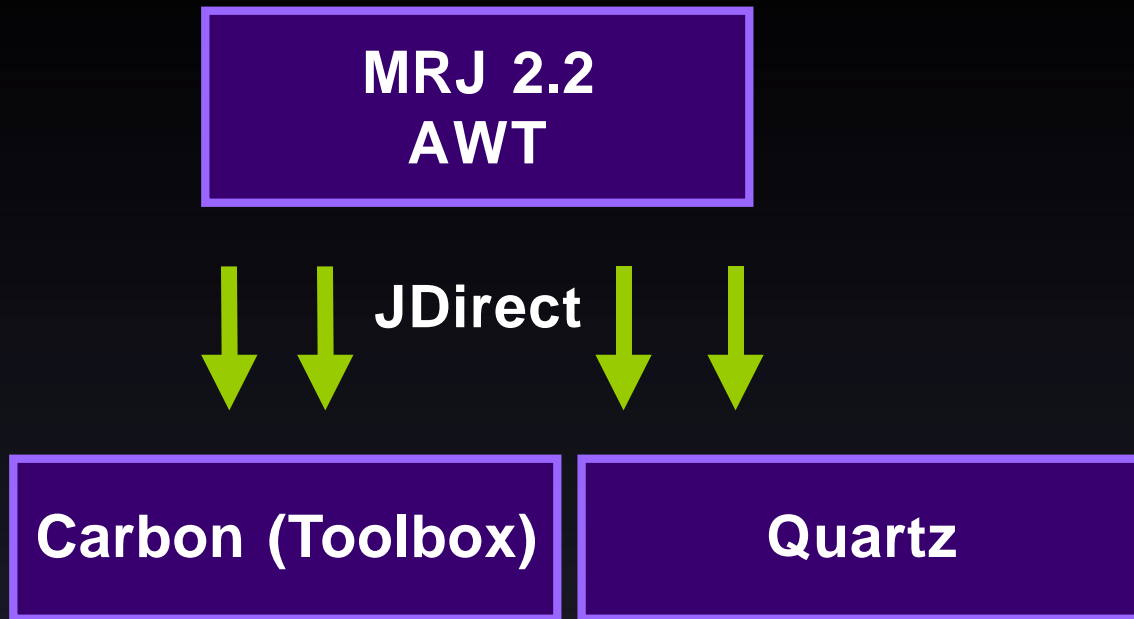


**AppKit (Cocoa)**

**Display PostScript  
(DPS)**



# Tomorrow's AWT



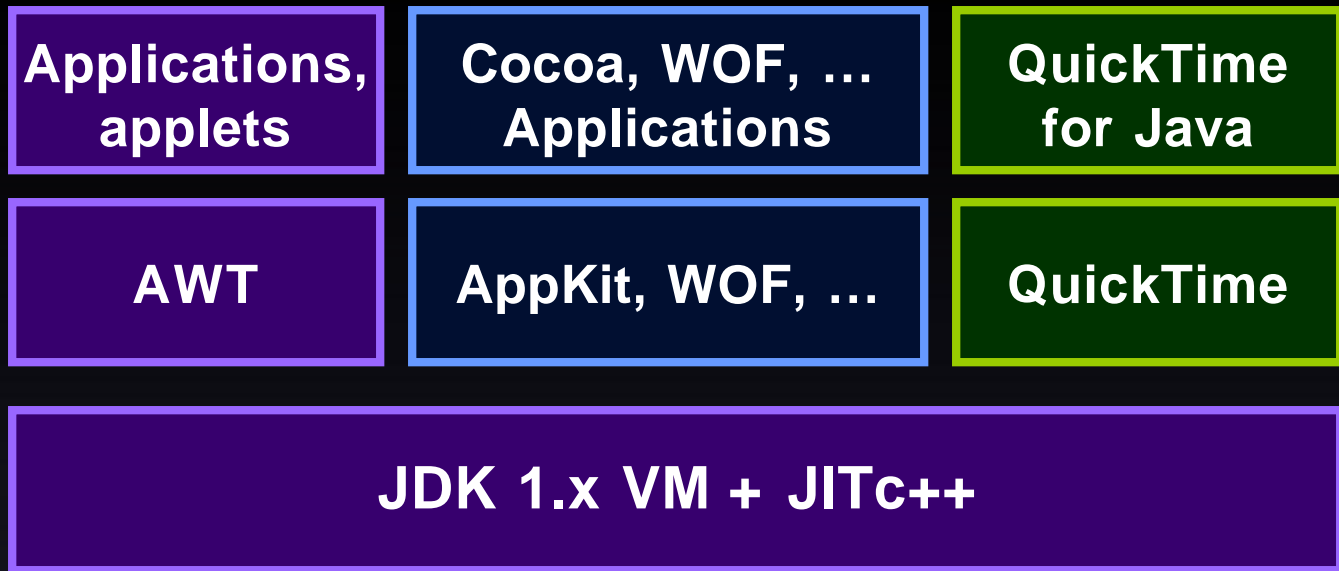


# This Millennium!

Java on Mac OS X



# Java on Mac OS X



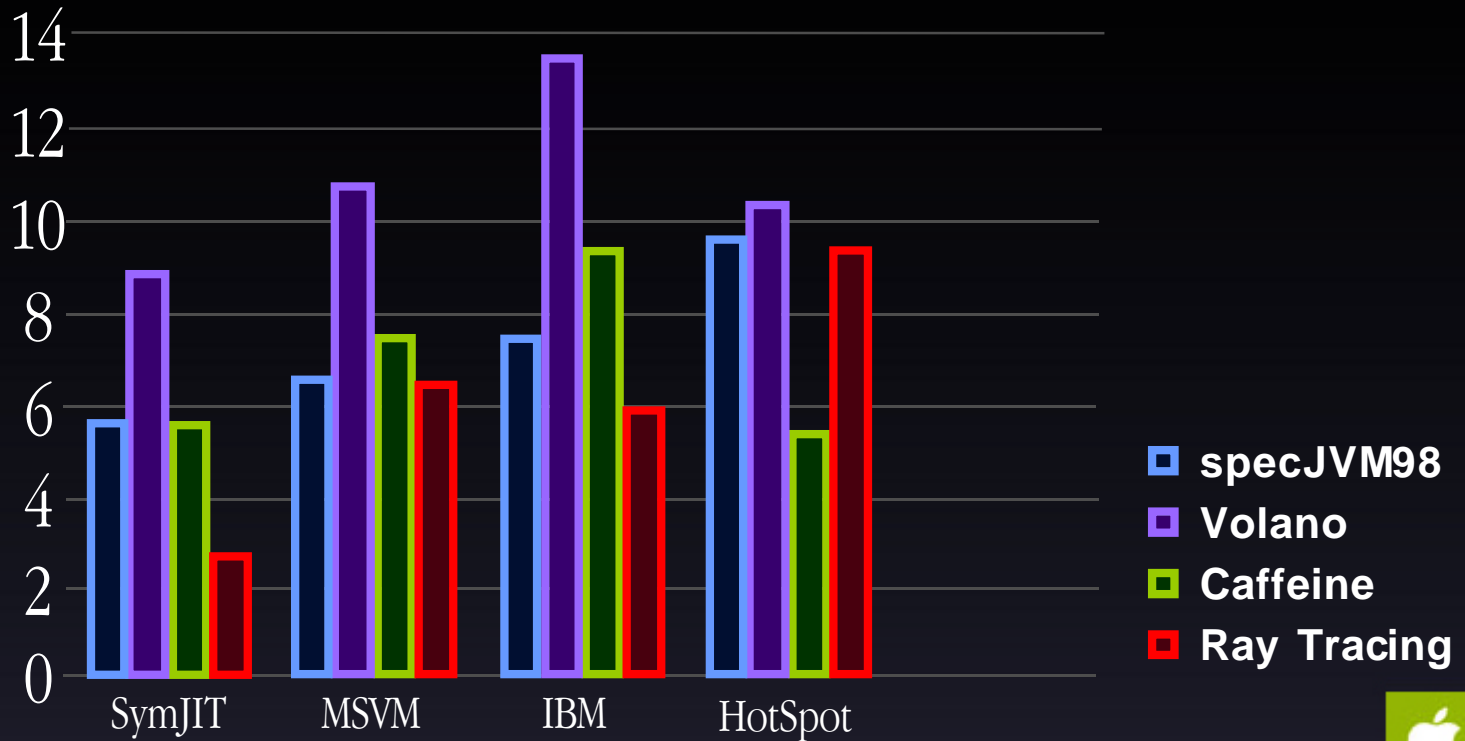
# About Performance...

- “Obvious stuff”
  - GC
  - Monitors
  - Fast and great compiler
- More “obvious stuff”
  - Class loading
  - Memory sharing
  - Persistent compilations

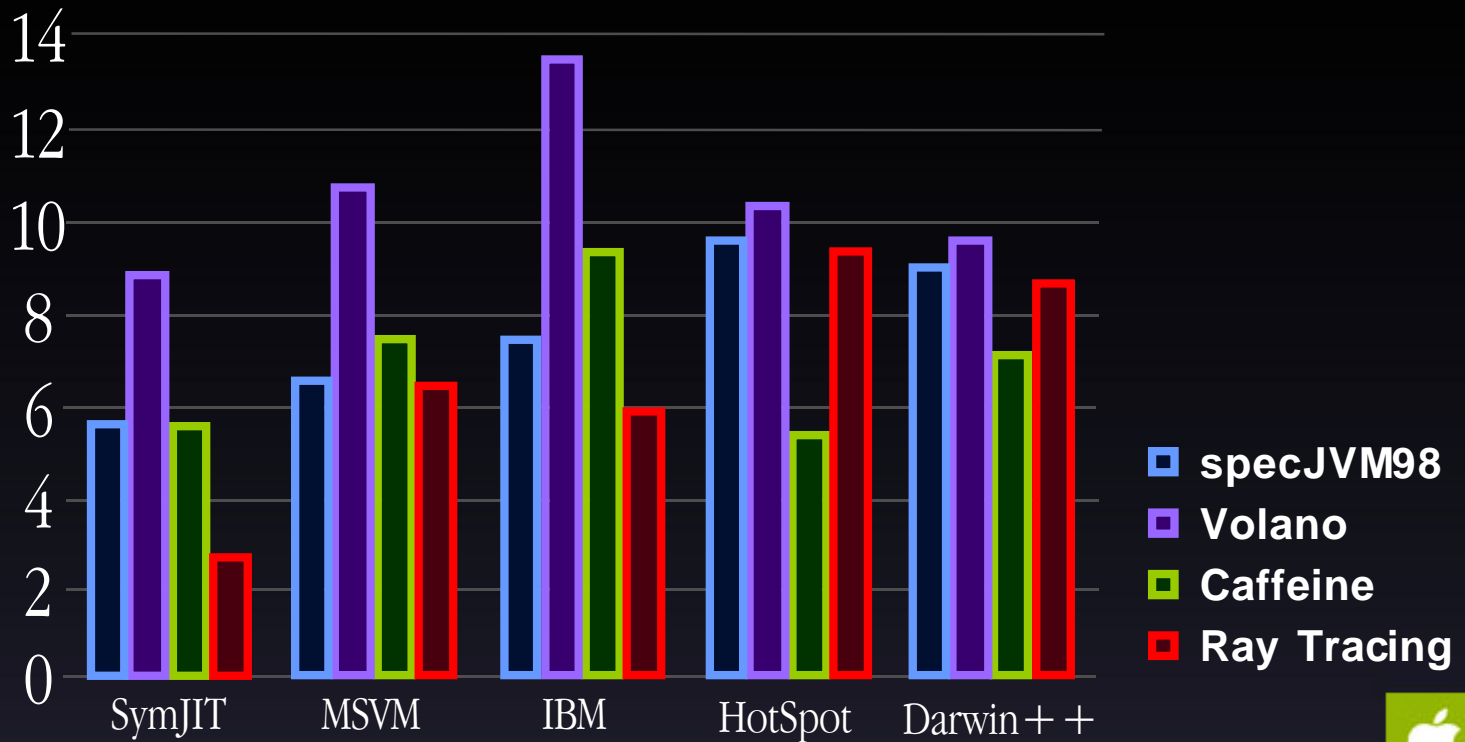




# NT Java Performance



# Darwin vs. NT Java Performance





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Q&A



Think different.<sup>TM</sup>



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