



Uncommon Object Model

Reasonable features

- Dynamic dispatch
- Single inheritance of implementation
- Multiple inheritance of abstraction
- Introspection
- Exceptions
- Garbage collection



Uncommon Object Model

Mature frameworks

- Foundation classes
 - Collection classes
 - Unicode strings
 - OS abstractions
- Distribution Model
- Persistence Model



Where Do I Get One?

• Java



Where Do I Get One?

- Java
 - Objective-C!!



Java in Developer Release

Mid-1997

- Sun JDK 1.1
- JIT
- Debugging



Java in Premier Release

Early 1998

- Better GC
- Better Performance
- Current JDK (1.2)



Java in Unified Release

Mid-1998

- Java 2.0, HotSpot
- Scalability
 - Reduced VM memory usage
 - Precompile commonly used classes
 - Scatter-load code and data to reduce memory footprint
 - Share classes between processes



Objective-C

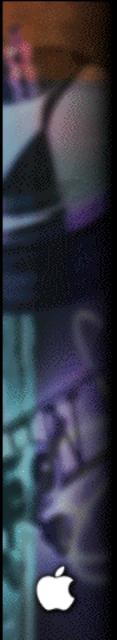
Ten years of refinement

- Highly tuned, scalable runtime
- Mature (dynamic shared) libraries
- Development tools
- Performance tools
- Java style syntax!



Objective-C: Runtime

- Meta-data kept in executable
- Hash table based dispatching
- Freeze-dried selector caches
- Dynamic code loading (NSBundle)
- Dynamic class creation (!!)



Objective-C

- Ten years of refinement
- Highly tuned, scalable runtime
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- Development tools
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- Java style syntax!



Objective-C: Modern syntax!

```
NSString description() {
    NSString here = @"Here: ";
    NSString tmp = list.description();
    return
    here.stringByAppendingString(tmp);
}
```



Objective-C

What's different

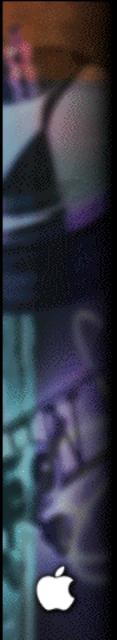
- Forwarding
- Categories (anybody can extend any class)
- Class objects
- C structs, unions, varargs, pointers...
- Swizzling



The Bridge

Packages map to Objective-C frameworks

- Java classes map to Objective-C classes
 - Subclass in Java
- Bridge handles messaging (this/self, super)
 - scalars -> scalars
 - exceptions -> exceptions
 - objects -> objects
 - protocols -> interfaces



What Should I Remember About This Talk?

- Closely working with Sun
- JDK, Beans, RMI, AWT, JFC, AFC...
- "Yellow Box" in Java on Mac OS, Rhapsody, Windows





