Cocoa Reverse Engineering and Plugin Development

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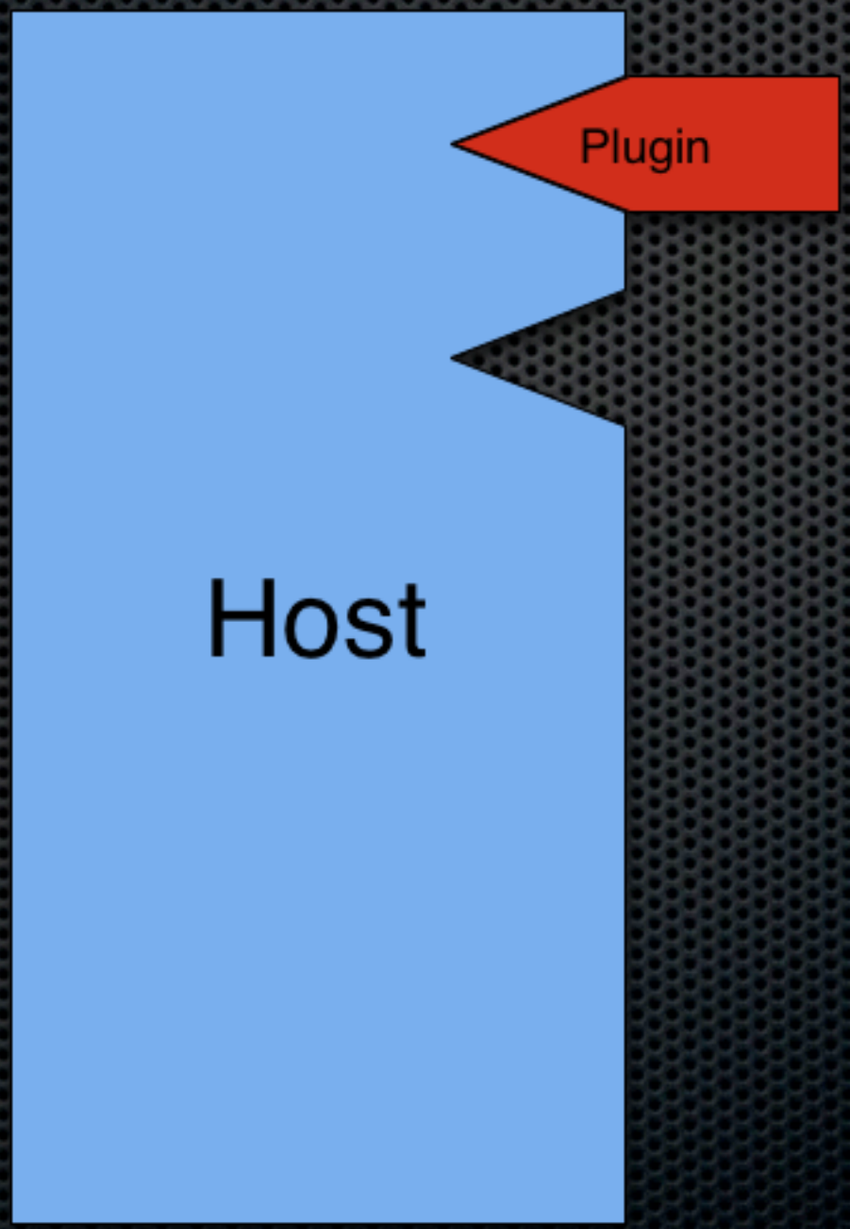
Why Plugins?

- Applications not perfect
- Specialized features
- Allows users to customize
- Iterative Development

Plugin Architecture



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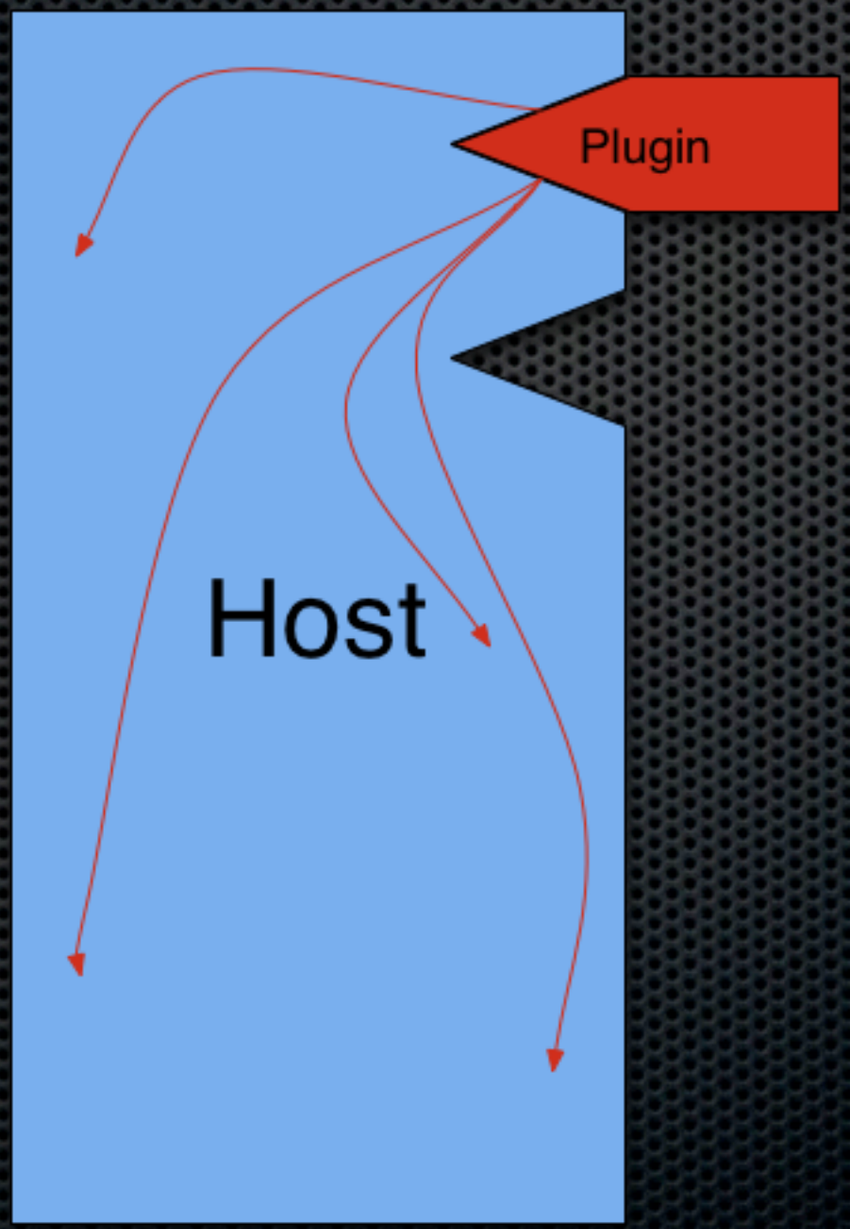

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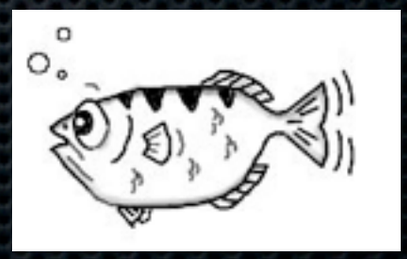
- Bundles provide principal class as entry point
- For Mail.app: Provide compatibility information (SupportedPluginCompatibilityUUIDs)
- If plugins not supported by app: SIMBL

Reverse Engineering

- strings
- class-dump
- F-Script, F-Script Anywhere
- gdb



Unix Tools

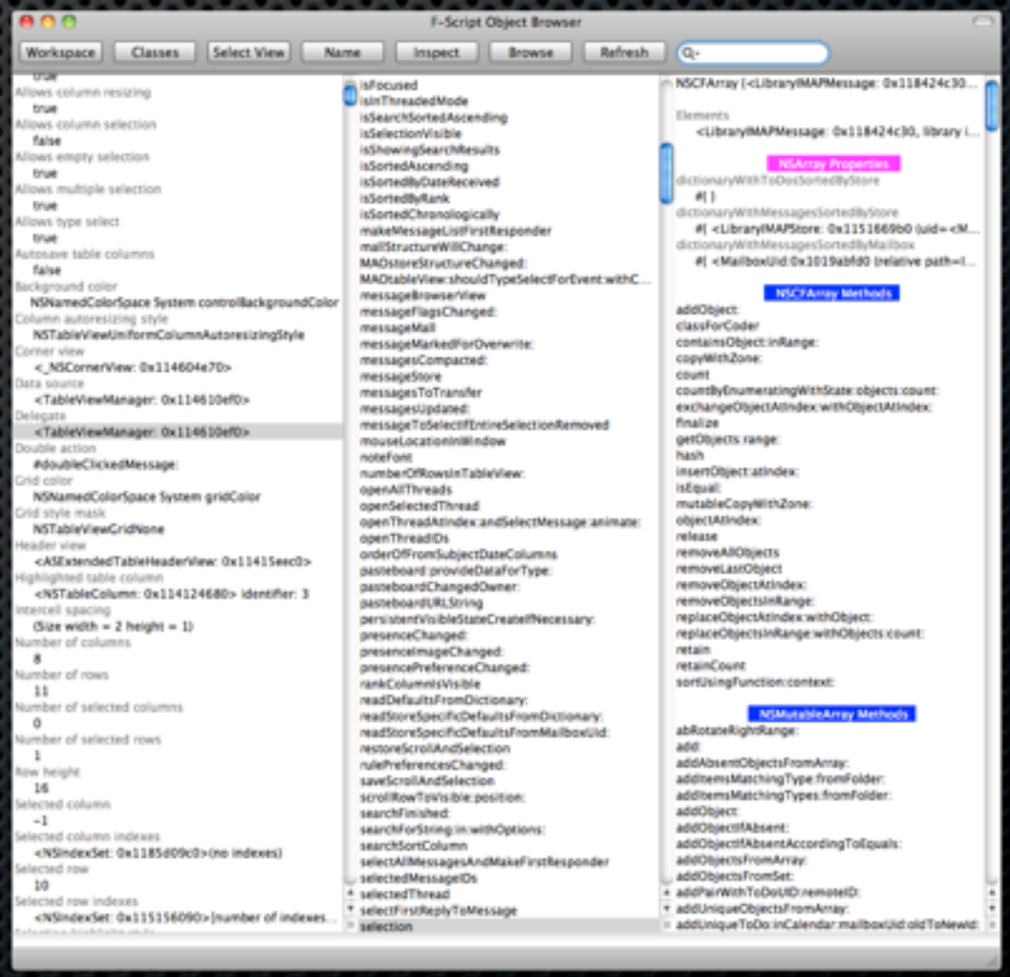
$strings Mail.app/Contents/MacOS/Mail
% P+
[...]
This method must be called off the main thread
/SourceCache/Mail/Mail-1076/Assistant.subproj/AccountAutoconfigurator.m
[...]
Searching local account settings...
LOCAL_BUNDLE_SEARCH
DontAutoconfigureFromOnlineISPDatabase
[...]
setAutoconfigurationActivity:
autoconfigurationActivity
[...]
Account
[...]

class-dump

- http://www.codethecode.com/projects/class-dump/
- Examines Objective-C runtime information
- Similar information to otool -ov
- But: formatted as Objective-C headers
- Usage: class-dump -H -o <output dir> <Mach-O file>

F-Script [Anywhere]

- Interactive introspection and manipulation of Cocoa objects
- Can be used stand-alone as scripting language
- Can be loaded into any Cocoa application at runtime
- Point and click interface to introspect any widget



F-Script Syntax

[object method]	object method
NSString *string = @”hello”	string := ‘hello’
[[string substringFromIndex:2] length]	(string substringFromIndex:2) length
array = [NSMutableArray arrayWithObjects:@”hello”, @”world”, nil]	array := {‘hello’, ‘world’}
	array length => {5,5}

Demo

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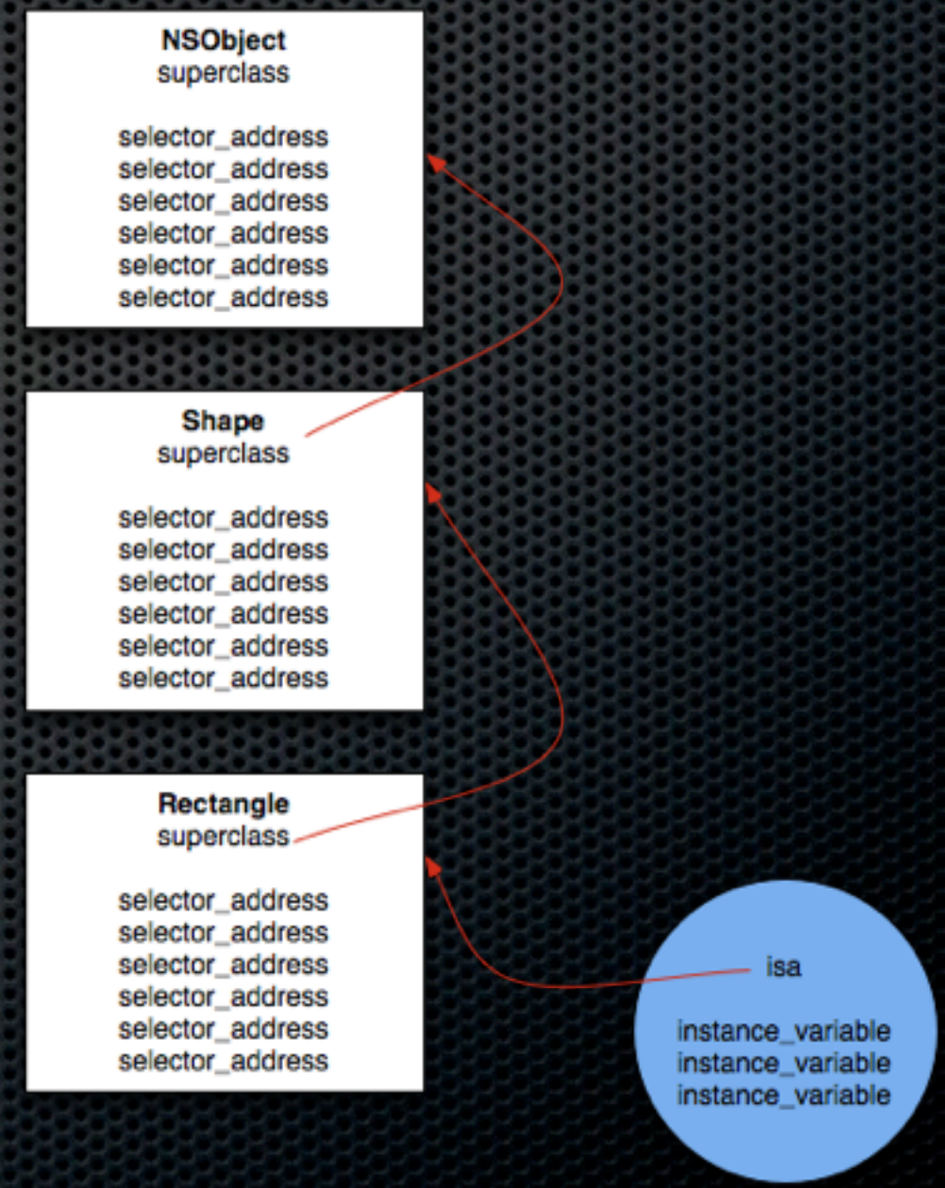
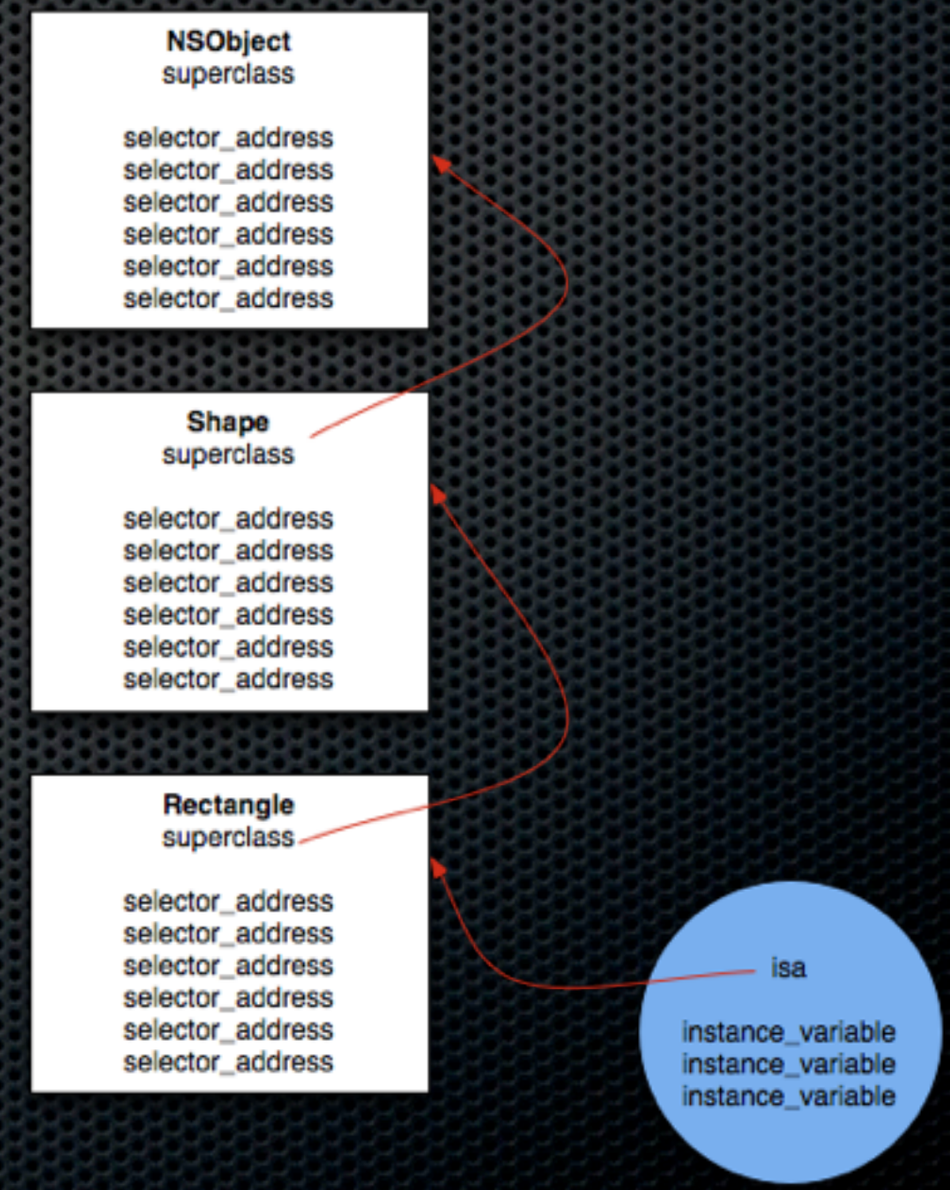


Objective-C Runtime System

- Use it for
  - Method Swizzeling
  - Subclassing
- poseAsClass: gone in Snow Leopard



Method Swizzeling

- Exchange implementation of 2 methods
- Allows redefining a method and reusing the old one
- Works without subclassing
- Wherever method is used, the behavior is changed

```
+ (void)PIMswizzleMethod:(SEL)originalSelector withMethod:(SEL)newSelector fromClass:
(Class)fromClass;
{
   Method originalMethod = class_getInstanceMethod([self class], originalSelector);
   Method newMethod = class_getInstanceMethod(fromClass, newSelector);
   class_addMethod([self class], newSelector, method_getImplementation(originalMethod),
method_getTypeEncoding(originalMethod));
   method_setImplementation(originalMethod, method_getImplementation(newMethod));

}
```

Demo

Resources

- F-Script
  - http://www.fscript.org/
- SIMBL
  - http://www.culater.net/software/SIMBL/SIMBL.php
- Tutorial by Mike Solomon
  - http://www.culater.net/wiki/moin.cgi/CocoaReverseEngineering#head-ed78de1fd3f2ae13b6ed4435cad6602ddae5a4f9
- Runtime Programming Guide
  - http://developer.apple.com/mac/library/documentation/Cocoa/Conceptual/ObjCRuntimeGuide/Introduction/Introduction.html
- Mail.app Plugin Developers Google Group
  - http://groups.google.com/group/apple-mail-dev

Thanks for your attention!

Questions?

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